Fostering Entrepreneurship and Innovation Through Business Incubators: A Comparative Analysis of the Role of European Business and Innovation Centres

Peter Wilson

NEWCASTLE UNIVERSITY LIBRARY
207 32534 8
Thesis L8904

Submitted to fufil the requirements of Doctor of Philosophy

School of Geography, Politics and Sociology,
University of Newcastle upon Tyne,

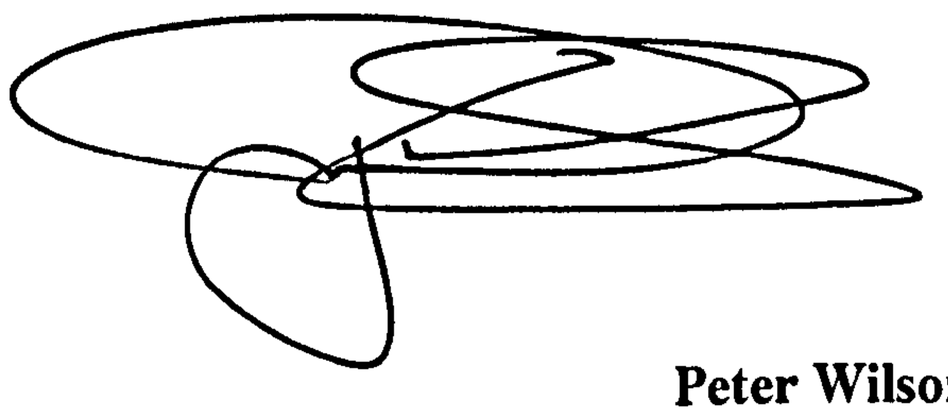
October 2008

Acknowledgements

I should like to thank my Supervisors, Professor Neill Marshall, Dr Pooran Wynarczyk (University of Newcastle) and Mr Arnold Raine (formerly CEO of the North East Business and Innovation Centre) for their continued support, guidance and insight over the last 4 years.

I should also like to thank the incubator managers, staff and stakeholders visited in the course of this research for their time, patience and participation and those business owner managers at the North East Business and Innovation Centre and beyond who participated in this research.

Finally, I should like to thank the Economic and Social Research Council and the North East Business and Innovation Centre not only for their financial support during the term of this research but also, as regards the latter, the time afforded to me by their staff in the conduct of this research.



Peter Wilson

The thesis contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. I give consent to this copy of my thesis, when deposited in the University Library, being made available for loan and photocopying subject to the provisions of the Copyright Act 1968.

Contents

Chapter 1	Introduction, Methodology & Conceptual Framework	1
1.1	Introduction	1
1.2	Research Aims & Objectives	1
1.3	Chapter Layout	2
1.4	Methodology	4
1.5	Conceptual Framework	9
1.6	Summary	23
Chapter 2	The Contribution of SMEs to Economic Performance	28
2.1	Introduction	28
2.2	Europe	30
2.3	Africa	32
2.4	Asia	33
2.5	Australasia	37
2.6	Developing Countries and Countries in Transition	38
2.7	The contribution of SMEs to economic performance	40
2.8	The SME contribution to economic performance in Europe	49
2.9	SME contribution to Employment	53
2.10	SME contribution to job creation	56
2.11	SMEs and innovation	68
2.12	SMEs and GVA	80
2.13	Summary: The contribution of SMEs to regional economic performance	87
Chapter 3	Public Support for Indigenous Businesses and Business Incubation	93
3.1	Introduction	93
3.2	Support for indigenous SMEs	93
3.3	Protectionist measures	97
3.4	Promotion of Mergers & Acquisitions	101

3.5	Subsidies for indigenous enterprise and/or attract foreign direct investment (FDI) and/or inward investment	103
3.6	Systems of supranational, national, regional and local grant aid	107
3.7	Business Support for Small Businesses & Business Incubation	112
3.8	Business Incubation	123
3.9	Business Incubation and Business Incubators: Scope	124
3.10	Incubator Focus	138
3.11	The Development of Business Incubation	145
3.12	Incubators today	152
3.13	Summary	160
Chapter 4	European Business and Innovation Centres (Case Studies)	166
4.1	Introduction	166
4.2	European Business & Innovation Centres: Background	166
4.3	Deployment of European Business Innovation Centres	173
4.4	EU BIC Business Model	179
4.5	Case Study 1	183
4.6	Case Study 2	206
4.7	Case Study 3	219
4.8	Case Study 4	232
4.9	Case Study 5	248
4.10	Summary	254
Chapter 5	The Added Value and Impact of Incubators	257
5.1	Introduction	257
5.2	General	257
5.3	The 'Added Value' of Incubators: Rationale	280
5.3.1	Business Incubator Added Value: Objects	282
5.3.2	The 'Added Value' of Incubators: Focus	284
5.3.3	The 'Added Value' of Incubators: Services	289
5.4	Summary	308

Chapter 6	Incubator Impact (North East Business & Innovation Centre)	319
6.1	Introduction	319
6.2	Evaluating Regional and Local Added Value and Impact	319
6.3	The impact of European Business and Innovation Centres	325
6.4	The Contribution of NEBIC (Local added value and Impact)	333
6.4.1	Qualitative Indictors	333
6.4.2	Quantitative Indicators	335
6.5	Hypotheses/Queries to identify different behaviours between incubated and non incubated firms vis-à-vis innovation	339
6.6	Hypotheses/Queries to identify different behaviours between incubated and non incubated firms vis-à-vis the general conduct of their business	340
6.7	Data Analysis: About the Sample	340
6.7.1	Innovation and Novelty: Product Innovators	342
6.7.2	Innovation and Novelty: Process Innovators	343
6.7.3	Innovation and Novelty: Administrative Innovators	344
6.7.4	Innovation and Novelty: General	346
6.7.5	Innovation and Propensity to Innovate: Product Innovators	348
6.7.6	Innovation and Propensity to Innovate: Process Innovators	349
6.7.7	Innovation and Propensity to Innovate: Administrative Innovators	350
6.7.8	Innovation and Investment in R&D (BERD)	351
6.7.9	Innovation & Market Focus	354
6.7.10	Innovation as the outcome of strategies and plans	355
6.7.11	Importance of Product Innovation	356
6.7.12	Importance of Process Innovation	357
6.7.13	How businesses innovate	359
6.7.14	Delineation of management responsibilities	365
6.7.15	Importance of Intellectual Property Rights (Protections)	366
6.7.16	Application of ICT	369
6.7.17	Quality Accreditation	372
6.7.18	Engagement with public sector business support infrastructure	375

6.7.19	Businesses reporting Growth as measured by increase in turnover	377
6.7.20	Businesses reporting Growth as measured by increase in employment	379
6.8	Innovation and the Conduct of business in sampled firms	380
6.9	Founder Characteristics of sampled firms	384
6.10	Summary	394
Chapter 7	Conclusions	397
7.1	Introduction	397
7.2	Policy Review	397
7.3	Observations on Business Incubation	400
7.4	The Impact of Business Incubators	410
7.5	Qualitative & Quantitative Results	412
References		424
Appendix 1:	Research Questionnaire	451
Appendix 2:	NEBIC Tenant Case Studies	469
Appendix 3:	BIC Tenant Profiles	523

List of Figures

Chapter 1

Figure 1	Conceptual Framework	26

Chapter 2

Figure 2.1	National Stock of Enterprises by Size Class	51
Figure 2.2	Profile of EU Employment by Size Class & National GDP	54
Figure 2.3	Average % Total Employment in the EU (2000) by Size Class	56
Figure 2.4	% Contribution to Total Net Change by Size of Firm (Number of Employees), Canada 2001-2004	60
Figure 2.5	% Contribution to Total Net Change by Size of Firm (Number of Employees) by region (Canada, 2001-2004)	62
Figure 2.6	Profile of % Change in Employment/Enterprise in EU 19 (by Enterprise Size Class) 1990-2001	65
Figure 2.7	Profile of Employment in EU 19 by Enterprise Size Class, 1990-2001	65
Figure 2.8	Proportion of EU Enterprise with Innovatory Activity (1998-2000)	74
Figure 2.9	Proportion of EU Enterprises reporting innovative activity by sector (1998-2000)	75
Figure 2.10	Total EU GVA (2000) by Size Class	80
Figure 2.11	Total & Average EU GVA (2000) by Size Class and 'Region'	82
Figure 2.12	Average GVA per EU Enterprise (2002)	84
Figure 2.13	GVA (Average) per Enterprise by Size Class (2000)	85
Figure 2.14	Value added per occupied person, Europe (19), 2003	89
Figure 2.15	Profitability by size-class, Europe (19), 2003	90

Chapter 3

Figure 3.1	Profile of Business Support Measures by Country	118
Figure 3.2	EU Business Support Measures by Country & GDP	120

Figure 3.3	EU Business Support Measures by Country & GDP & Target Population	121
Figure 3.4	Incubator Typology drawn with reference to Level of Management Support and Technology Orientation	128
Figure 3.5	Evolution of Incubation Model(s)	130
Figure 3.6	UK Distribution of EU BICs and UKBI Incubators	153
Figure 3.7	Incubator distribution in two of the six sub-regions of the East Midlands (UKBI and Non UKBI Incubators)	156
Figure 3.8	Incubator distribution in London (UKBI and Non UKBI Incubators)	158
Figure 3.9	Distribution of Incubators in Germany (ADT and Non-ADT accredited)	159
Figure 3.10	Distribution of Incubators in EU (2002)	162
Figure 3.11	Distribution of Incubators in EU by number of SMEs (thousands) and by Country	164

Chapter 4

Figure 4.1	Model Organisational BIC Structure	170
Figure 4.2	Example Incubation Service Model	172
Figure 4.3	Distribtion of BICs 2004	178
Figure 4.4	Distribution of EU BICs	179
Figure 4.5	BIC Business Model	180
Figure 4.6	BIC Revenue Streams	180

Chapter 5

Figure 5.1	HIVE Incubation Model	297
Figure 5.2	Added Value Incubator Business Functions	302
Figure 5.3	Draft Model of NEBIC Business Support Functions by Added Value	303
Figure 5.4	NEBIC Tenant Interview Responses	304
Figure 5.5	NEBIC tenant interview responses	305
Figure 5.6	Model of NEBIC Business Support Functions (Value Added)	307

Figure 6.1 Example: North East Business and Innovation Centre 326

List of Tables

Chapter 2

Table 2.1 EU Profile of Enterprise (Data) 50
Table 2.2 US Profile of Enterprise (Data) 50
Table 2.3 Profile of European Enterprise Stock by County and Size Class (%) 52
Table 2.4 European SME stock by country, size class and region 55
Table 2.5 SME contribution to Job Creation 59
Table 2.6 Quarterly Net Change in Payroll Employment by Firm Size, Canada, Q1 2001 to Q3 2004 61
Table 2.7 % Contribution to Total Net Change by Size of Firm (Number of Employees) by region (Canada, 2001-2004) 63
Table 2.8 Value added by country and size class (million Euros), 2000 81
Table 2.9 Value added/enterprise by country and size class - 2000 - (1000 Euros) 83
Table 2.10 Value added/enterprise by country and size class (2000) (1000 Euros) by 'Region' 84
Table 2.11 Value added/employment by country and size class – 2000 (1000 Euros) by region 86
Table 2.12 Average GVA/employment (1000 Euros) 87

Chapter 3

Table 3.1 Profile of EU Business Support Measure by Objective 119
Table 3.2 Profile of EU Business Support Measure by Type 122
Table 3.3 Incubator Value-Added Continuum 136
Table 3.4 Sample East Midlands Incubators and Operation of Entry Policies 139
Table 3.5 Incubator Distribution Statistics 152
Table 3.6 European Commission EU Incubator Statistics 154
Table 3.7 Incubators in two of the six sub-regions of the East 155

Midlands

Table 3.8 Incubators in London region (UKBI Members in Bold) 157

Table 3.9 Distribution of EU Incubators by Country and No. of indigenous SMEs 163

Chapter 4

Table 4.1 Deployment of EU BICs by Country 174

Table 4.2 Profile of BIC Revenue derived from EU Programmes (%) 181

Table 4.3 NEBIC Personnel functions 191

Table 4.4 NEBIC Income 198

Table 4.5 NEBIC Expenditure 204

Table 4.6 TEK Personnel functions 223

Chapter 5

Table 5.1 Variation in Incubator Sponsor Goals 282

Table 5.2 Profile of EU Incubator Activities 285

Table 5.3 EU Average Length of Incubator Tenancies 290

Table 5.4 East Midlands Incubator Sample, Exit Criteria 290

Table 5.5 Types of Business Support Services 296

Table 5.6 EU Incubators Sources of Funding 310

Table 5.7 Importance of Cash subsidies to Incubator Operations 311

Table 5.8 Is 'break even' part of (EU) Business Incubator's business plan? 311

Chapter 6

Table 6.1 BIC Collective Interventions (2003) 332

Table 6.2 Incubator Objects 333

Table 6.3 Performance Outputs NEBIC 2004/2005 336

Table 6.4 Profile of innovative projects by sector 337

Table 6.5 Historical Impacts 337

Table 6.6 Respondent Size as measured by total employment (Average Mean) 341

Table 6.7	Respondent Size as measured by total turnover (Average Mean)	341
Table 6.8	Average (Mean) Age of Respondent Businesses	341
Table 6.9	Innovation & Novelty: Product Innovators	342
Table 6.10	Innovation & Novelty: Process Innovators	344
Table 6.11	Novelty: Respondents Reporting Administrative Innovations	345
Table 6.12	Novelty: Respondents reporting innovation(s) as...	347
Table 6.13	Propensity to Innovate: Product Innovators	348
Table 6:14	Propensity to Innovate: Process Innovators	349
Table 6.15	Propensity to Innovate: Administrative Innovators	350
Table 6.16	Respondents reporting investments in R&D (BERD)	351
Table 6.17	Innovation & Market Focus	354
Table 6.18	Innovation Programmed as part of a strategy or plan	355
Table 6.19	Importance of Product Innovation to...	356
Table 6.20	Importance of Process Innovation...	358
Table 6.21	Collaborative R&D: Product Innovation	359
Table 6.22	Collaborative R&D: Process Innovation	362
Table 6.23	Management characteristics	365
Table 6.24	Importance of Patents & Patent Protection to Respondents	366
Table 6.25	Importance of Trademarks & Trademark Protection to Respondents	367
Table 6.26	Importance of Copyright & Copyright Protection to Respondents	367
Table 6.27	Importance of Confidentiality & Protecting Confidentiality to Respondents	368
Table 6.28	Importance of Pay & Reward Strategy to Respondents as a Means of Protectign IPR/Know-How	368
Table 6.29	ICT applications employed in respondent businesses	370
Table 6.30	Quality Accreditation in respondent businesses	373
Table 6.31	Respondents reporting that they have benefited from public sector business support programmes	375
Table 6.32	Businesses reporting Growth as measured by increase in turnover	378

Table 6.33	Businesses reporting Growth as measured by increase in employment	379
Table 6.34	Founder joint work experience	384
Table 6.35	Founder Previous Work Experience (i)	385
Table 6.36	Founder Previous Work Experience (ii)	386
Table 6.37	Founder Previous Work Experience (iii)	387
Table 6.38	Founder Previous Work Experience (iv)	388
Table 6.39	Founder Previous Work Experience (v)	389
Table 6.40	Founder's Level of Educational Attainment	390
Table 6.41	Founder Motivation at Start-Up	393

Chapter 1: Introduction, Methodology & Conceptual Framework

1.1 Introduction

Interventions aimed at creating an environment in which businesses can flourish are a central element of public policies (supranational, national, regional and sub-regional/local) concerned with promoting enterprise and entrepreneurship, supporting indigenous industry and fostering regional economic competitiveness. Customarily policies concerned with improving the business environment have been of two types; those concerned with the improvement of the interactions of government with enterprises in terms of regulations, administrative procedures and taxation, and those concerned with the direct provision of various forms of business support such as business incubation.

This research explores the rationale for the provision of business support, specifically business incubation as practised by European Business Innovation Centres, and investigates the degree and extent to which their activities impacts the performance of assisted businesses.

1.2 Research Aims & Objectives

This research has been conducted in accordance with the scope of an ESRC collaborative studentship Award (2001) sponsored by the North East Business & Innovation Centre Limited ('NEBIC').

The research investigates the development of business incubation and the policy rationale for the modality, specifically the role and importance of SMEs and includes an investigation of business incubation as developed and practised by the European Business Innovation Centre 'NEBIC' and its impact on incubated businesses. In addition, this research has explored and investigated:

1. The contribution of SMEs in regional economic performance in 'less-favoured' regions of Europe;

2. The development of business incubators (including the role of stakeholders), incubator models (i.e. the impact of information and communications technology, and the development of 'new technology', 'third generation', or 'dot.com incubators') and their deployment in 'less-favoured regions of Europe;

3. The added value of Business Incubators to the local and regional economy, explored with reference to the nature, focus and level of their activities and the services they provide. In particular, this was explored in the preparation of five case studies which compared the nature of operations of incubators accredited to the European Business and Innovation Centre Network (EBN) standard; and

4. The impact of business incubators on the growth and development of innovative SMEs, specifically North East Business and Innovation Centre (NEBIC) in Sunderland (UK) and the performance of incubated firms relative to other firms located outwith NEBIC by comparing characteristics, performance and their behaviour vis-à-vis innovation.

This research has sought to explore the nature of activities of business incubators and the way in which they add value to their local and regional economies. It endeavours to determine, notwithstanding inherent difficulties in attribution (i.e. determining cause and effect) whether incubators, specifically NEBIC, impacts the performance of incubated firms.

1.3 Chapter Layout

Chapter 1 explains the methodology adopted for this research and explores and develops a conceptual framework for this study informed by a literature review and empirical research.

Chapter 2 considers the context for business incubation and investigates the importance of SMEs, their place in economic development policies and their contribution to economic performance. The chapter offers a brief review of those

facets of SME policy that have achieved or are accorded prominence around the globe before exploring the historical contribution of SMEs and their part in the economic structure with reference to the demographics of economic activity, their contribution to economic growth, innovation, and employment in Europe, particularly in 'less-favoured' regions of Europe (which are defined in this research as those countries with a GDP less than the EU average explain this the first time you refer to it?). The chapter also provides an overview of scholarship vis-à-vis investigations into the contribution of SMEs to innovation with reference to results obtained in this research (derived from a sample of 300 selected firms in the North East based within and outwith the North East Business & Innovation Centre) before concluding with an examination of the SME contribution to GVA and in less favoured regions of Europe.

Following the review of the contribution of SMEs in less-favoured regions of Europe and their place in the economic structure, Chapter 3 proceeds to provide an overview of some of the chief instruments of industrial policy deployed to support indigenous SMEs and specifically the development and deployment of business incubation therein; and the place or role of policy makers, business support agencies, etc therein with reference to the nature of their stake-holding. In addition, Chapter 3 explores the impact of information communication technologies (ICT) and e-commerce on the growth and development of the business incubators model i.e. 'new economy incubators'.

Chapter 4 offers an overview of business incubation as developed and practised by EU Business and Innovation Centres (BICs). "Some 150[+] Business and Innovation Centres (BICs) successfully operate organisational models of comprehensive systems of business support services for the launch and development of innovative enterprises. Based on a public/private and local/regional partnership, BICs act in their areas as an interface between the needs of enterprises and the offer of specialised services. They also contribute to the internationalisation of firms (marketing, interregional co-operation). The spreading of BICs in all assisted areas and their more intensive use in implementing regional programmes would help further disseminate good practice in business creation and development. BICs are linked by co-operation agreements to other Community

networks, such as the Innovation Relay Centres, the Euro Info Centres or the LEADER/LAG."[1]. Chapter 4 compares and contrasts the activities of 5 UK BICs in an endeavour to develop an understanding of the nature and level of their operations, services, etc, and an insight into industry best practice.

Chapter 5 explores and examines the contribution of business incubators to local and regional economies and the way in which they seek to add value with reference to their modus operandi, their aims and objectives and the nature and level of services they provide before concluding with the development of a model of 'value-added' business support functions developed in consultation with North East Business and Innovation Centre staff and tenant firms and from observation of incubator operations e.g. at NEBIC, (Sunderland), Entrust (Newcastle), ATMEL/Cenamps (Newcastle), The Digital Factory (Newton Aycliffe), Loughborough Innovation Centre, DeMontfort Innovation Centre, UNIEI (Nottingham), BioCity (Nottingham), The Hive (Nottingham), Mansfield I-Centre, Midlands Innovation Relay Centre (Coventry), St Johns Innovation Centre (Cambridge) between 2001 and 2005.

Chapter 6 picks up the theme of 'added value' as delivered by business incubation and examines the impact of business incubators and specifically, that of NEBIC, on the growth and development of innovative SMEs located therein.

Finally, Chapter 7 presents an overview of key findings from the literature review and empirical research and notes their implications.

1.4 Methodology

The methodology adopted for this programme of research was prescribed by the terms of an ESRC Case Studentship award, as agreed between the University of Newcastle, the North East Business and Innovation Centre (the industrial sponsor of this ESRC Case Award) and the Economic and Social Research Council.

---

[1] European Commission Guidelines for programmes in the period 2000-06,

This investigation has utilised qualitative and quantitative approaches and techniques. In 2001, a comprehensive review of the literature concerned with theories of economic development and topics such as the SME sector, innovative SMEs, business incubation in the UK, Europe and the USA was conducted. The review, which included consideration of relevant public policy and initiatives and secondary data analysis, informed the development of a framework for the empirical research and, in particular, the definition of specific research questions to explore a number of hypotheses – principally that:

(a) public support for SMEs - à la business incubation - is justified given the contribution of SMEs to regional economic development and growth (particularly as regards their share of employment, capacity for innovation, job creation and importance to regional economic competitiveness and regeneration);

(b) business incubators, specifically European Business Innovation Centres (BICs), enhance the performance of the firms they support or thereby contributing to the economic development of the region they serve which justifies the degree and extent to which they have been adopted and deployed as an instrument of economic development policy;

(c) innovative SMEs and/or SMEs supported to be innovative generate increased economic effects than non-innovative/non-supported businesses; and

(d) The nature and level of services provided by business incubators, specifically BICs, warrants public confidence and support (public investment) given their impact.

Subsequently in 2002, the operation, activities and evolution of the North East Business & Innovation Centre Limited (NEBIC) were subjected to a close examination to better understand the nature and level of services provided and their impact, particularly on the performance of the firms supported therein. Qualitative and Quantitative techniques were used; participant observation,

unstructured and semi-structured interviews were conducted with NEBIC's business advisors, experts and stakeholders. Publications and research held at NEBIC were also consulted and an appreciation and understanding of NEBIC's, aims, objectives, functions and services was enhanced by attendance and observation at seminars and workshops organised by NEBIC and the European Business Incubator Network (EBN) and by interviewing NEBIC, EBN and other incubator personnel.

This work informed the development of case studies to facilitate comparisons between the activities of NEBIC and four other EBN accredited business incubators (BICs), presented in Chapter 5, providing an overview of their operations, identifying commonalities, good practice and noting how each has interpreted and extended the EU BIC model with reference to regional market conditions, regional economic priorities, the existence of complementary business services. Of the BICs selected for study, NEBIC was prescribed for study under the terms of the ESRC Case Studentship; Coventry BIC was selected as an example of a university operated BIC and St John's Innovation Centre because of the economic prosperity of the region (which is in stark contrast to that of the North East of England). Kent BIC was chosen for study as it operates from multiple locations; and Hertfordshire BIC because at the time of writing it was the newest addition to the stock of BIC incubators.

Also selected for study was London (Lee Valley) BIC given the novelty of the business model (taking equity in assisted businesses in exchange for the incubator's assistance), however the BIC went into administration before any study could be undertaken. Pronovus (Nottingham BIC) and BIC SwedenWest were also selected for study as examples of BICs operating a 'virtual incubator' model (providing no accommodation for assisted businesses). Unfortunately, both BICs closed - seemingly for lack of patronage (political and/or financial) - before detailed study could be undertaken.

This work was conducted as part of a systematic attempt to investigate the performance of firms located at a BIC, specifically NEBIC, compared with the performance of firms located outwith the BIC environment with the aim of

identifying if and how the incubator is impacting the performance of businesses located therein. In 2003, 205 SMEs were interviewed from a sample of 300 that was created from (i) the stock of businesses located at NEBIC, (ii) other North East incubator facilities and (iii) businesses located in the North East (outwith both NEBIC and other incubator facilities) and selected at random from existing CURDS and NEBIC databases of regional businesses.

While every effort was made to select firms comparable to those located at NEBIC as part of the sample to provide a proper base of comparison it proved impracticable to identify and select for each NEBIC located business a firm of a comparable size (as measured with reference to number of employees and/or turnover), age, sector, customer base, supply chain, applications of technology, skill level of management and staff, etc. Notwithstanding the inherent difficulties in constructing the sample, the selection of firms outwith NEBIC and other incubators as part of the sample was however refined so that only firms located in Tyne & Wear were selected for comparison in the hope that they would be operating in otherwise similar trading conditions, with access to broadly similar factor inputs (e.g. skill level of indigenous population employed in the businesses), comparable access to the same local business support services, proximity to other factor inputs, etc as the incubated businesses studied. In this way, businesses operating at the periphery of the region i.e. in rural areas were omitted on the grounds that the nature, size, factor inputs, etc of these businesses was unlikely to be as comparable with the NEBIC firms as other firms operating in closer proximity to the NEBIC firms (i.e. within one of the largest conurbations in the region (Tyne and Wear)).

The researcher contacted each of the firms selected to explain the nature of the research, obtain their agreement to participate in this research and identify the proper person to survey and/or interview (i.e. most able to respond to the questions). The questionnaire was piloted with 10 firms selected at random from public databases and was subsequently revised to include questions to capture other business characteristics and test a range of hypotheses related to key propositions - namely that incubated firms will outperform their non-incubated

counterparts (e.g. by more innovatory) and demonstrate a range of characteristics and more 'advanced' or 'sophisticated' behaviours that enable such performance.

Despite assurances as regards confidentiality and anonymity, respondents were found to be reluctant to participate in taped interviews. Midway through the piloting of the questionnaire the taping of interviews was abandoned with responses written up during the interview (which was then conducted in person or by telephone according to the respondent's preferences). The interview questions were also laid out in the form of a postal survey for respondents who were prepared to participate in the research but were unwilling to be interviewed by telephone or in person.

The survey and interview questions - which featured open and closed questions - were designed to capture information on the characteristics of respondent firms and their performance. These questions were modified and refined following the pilot activity so as also to collect data on the characteristics of the businesses founders.

The sample and data set was assembled from the information gathered from the postal survey and interviews conducted by telephone and/or in person at the respondent's business premises. The sample (respondent profile) comprised 66 firms located at the North East Business & Innovation Centre in Sunderland and 143 firms located outwith the Centre but within the Tyne and Wear (of which 17 were resident in other incubators in the locality). The quantitative data was analysed (using SPSS). Material for case studies illustrating the varied nature of businesses located at NEBIC, founder characteristics, size (number of employees and/or turnover), customer profiles, importance the business accords innovation and presenting the views respondents expressed as to the value of incubator services was also collected and is presented in Appendix 2.

While the interviews with NEBIC personnel, incubator stakeholders and incubated firms were conducted in a manner that invited full and frank disclosures it must be acknowledged that, as in all research, the responses received by respondents may be coloured by the respondents own interests and/or concerns as

to what use their responses may be put (e.g. it is to be expected that incubator personnel might be reluctant to disclose information or provide responses that reflect badly on the incubator or indeed the form of support that is business incubation given that it is their livelihood). Similarly, an SME respondent operating within an incubator (i.e. NEBIC) might be reluctant to articulate criticisms or doubts as to the effectiveness of services or the degree and extent to which they impact their business as it might jeopardise their position in the facility and/or undermine their relationship with incubator personnel.

Furthermore, it should also be acknowledged that it could be argued that many incubator personnel and incubated firms are conditioned to report positively on incubator operations not necessarily by the incubator's management but rather as an inevitable consequence of the many other studies or evaluations to which they are subject (many of which are part and parcel of the public funding the incubators receive). It is generally understood that a favourable evaluation report enables the provision of subsidised services and accommodation i.e. is instrumental in maintaining political and financial support for the incubator. Again, it is neither in the interest of incubator personnel or incubated firms to 'bite the hand that feeds them' by reporting negatively or commenting unfavourably on incubator operations in any evaluation or study that might undermine support (political or financial) for the business incubator modality and their incubator in particular.

1.5 Conceptual Framework

Business support measures such as business incubation are usually presented as a response to structural disadvantages particularly those suffered by small and medium-sized enterprises or when there are considerations relating to regional imbalances and market failures. A market failure can be defined, for example, as "the inability of a system of private markets to provide certain goods either at all or at the most desirable or 'optimal' level" (Pearce, 1996). As regards the provision of business support, specifically business incubation services, it is maintained that:

- policies and measures are required to enable small businesses to compete on an equal footing with larger organisations and to boost regional competitiveness and support economic regeneration);

- A market failure exists insofar as private companies cannot or will not provide business support services because they cannot make a commercial return even where there is demand or need for a service. As explored in Chapters 3-5, the reliance on public sector funding for business incubator operating costs and the scarcity of private sector incubators does seem to evidence this proposition; and

- The provision of incubator services will support the recipient businesses to develop, leading to the generation of new wealth and/or employment. The rationale for business support, particularly SME support is investigated in Chapter 2. An evidential basis for the proposition that a business support service, specifically business incubation, is responsible for economic and social effects is investigated in Chapters 3-6.

Notwithstanding the fact that the policy conviction for the provision of business support services is 'debatable'; for example, Bannock (2005) reviews the case for SME policies and takes a sceptical view of the need for governments to provide or fund information, advice or consultancy for SMEs (see also Parker, (2000), Dannreuther, (1999); Castel-Branco, (2003) and Curran (2000) and Gibb (2000) who express reservations about the value of SME support as a whole); business support services have been and are a significant article of public policy. Traditionally, measures have included a range of financial instruments that have included direct grants, subsidised loans, loan guarantees and increasingly initiatives to make venture capital more readily available. However, there has also long been support in the form of specialised types of training and in the direct provision of services offering information, advice and various kinds of practical assistance (including business incubation).

According to Peck (2001, p.445) public policy at the macro level is 'dominated by various strands of neoliberal conviction politics, which assert that

the fiercely competitive economic environment abroad, coupled with deep-seated social problems at home, leave 'no alternative' to a course of deregulation, marketization, privatization, and public asset-stripping'. According to Peck this 'policy medicine ...never mind what it says on the bottle... is pretty much the same: purge the system of obstacles to the functioning of 'free markets'; restrain public expenditure and any form of collective initiative; celebrate the virtues of individualism, competitiveness, and economic self-sufficiency; abolish or weaken social transfer programs while actively fostering the 'inclusion' of the poor and marginalized into the labor market, on the market's terms'. While much of the literature analysing economic policy of the last 20 years is laced with thinly veiled invective and vitriol, Peet and Hartwick (1999, p.52) summarise the neoliberal policy prescription as follows:

- Fiscal discipline: the effective capping of government budget deficits.
- Public expenditure priorities: should focus on supply-side investments not on social amelioration or progressive redistribution.
- Tax reform: rates should be held down and incentives sharpened.
- Financial liberalization: interest rates and capital flows should be market determined.
- Exchange rates: rates should be sufficiently competitive to induce rapid growth in non-traditional exports.
- Trade liberalization: quantitative restrictions on imports should be removed.
- Foreign direct investment: barriers to the entry of foreign firms should be abolished.
- Privatization: state enterprises should be returned to private ownership.
- Deregulation: governments should abolish regulations restricting competition.
- Property rights: legal systems should ensure property rights without excessive costs

Crucially, according to Peck, these neoliberal prescriptions are often elided with, or relabelled as, 'imperatives of globalization'. As such, they are more likely to be perceived as economically derived rather than politically

constructed/mediated pressures. For Beck (2000, p. 122) neoliberalism is a form of *'high politics'* which presents itself as completely *non*-political.

As is evident from the above 'business incubation' is not specified as part of the neoliberal prescription nor is there a stipulation concerned specifically with SMEs. Indeed, of the literature reviewed in the course of this research concerned with macroeconomic policy both receive scant attention (perhaps because they are held in scant regard) at the macro or national policy level or perhaps in recognition that the practice of business incubation and measures concerned to support SME development are more a product of economic development and regeneration strategies and plans formulated at the regional level as an instrument to reengineer the dynamics of regional economic growth.

As regards understanding the dynamics of regional economic growth, most early theories of regional economic growth might be described as a product of neoclassical trade theory and growth theory which assumes that over time, differences in the price of labour and other factors across regions diminish and tend towards convergence. The theory, as noted by Dawkins (2003), has never sat particularly well with regional policy makers given the trend toward international divergence between the per capita incomes of industrialised nations and less developed nations (observed throughout the world since the end of World War II).

While the empirical studies of Perloff et al 1960; Williamson 1965 were able to demonstrate economic convergence at the regional scale, Barro and Sala-i-Martin (1999) later postulated that that interregional convergence is more likely than international convergence because factors of production are more highly mobile across regions than between nations. More recently, neoclassical exogenous growth and trade theories have been supplemented by new endogenous growth theories that include departures from the received wisdom i.e. that convergence is the inevitable outcome of regional growth and that divergence is equally possible. Other variants to the endogenous growth theories acknowledge the importance of, and admit as endogenous to the model, such factors as technological change and innovation (Schumpeter, 1947), knowledge and

knowledge spill-overs (Romer, 1986), human capital (Lucas, 1988) and investment in public infrastructure (Barro, 1990).

Moreover, the new empirical, economic and political realities that emerged in the late 1970s and early 1980s; namely the decline of manufacturing and the emergence of the service sector in the industrialized world, the increasing international mobility of capital and labour flows, and the growing interregional disparities in labour conditions across gender and ethnic lines posed an unprecedented challenge for policy makers (national, regional and local) as they endeavoured to manage an inevitable and complex adjustment of the national and regional economic structure. At a time when the convergence foreseen by neoclassical trade and growth theorists looked less than compelling various adjustments and proposed modifications to neoclassical theory have fired the imagination of policy makers in search of convergence (in less favoured regions) and increased divergence (in more favoured regions looking to maintain and extend their competitive advantage relative to other regions).

The literature concerned with developing an understanding of the dynamics of regional economic growth - of which echoes can be found readily in contemporary regional economic policies and initiatives and the nature, focus and form of business support services, specifically incubator modalities (their function and the nature of services they provide) - is something of an ever-broadening church where concepts and notions can often be more compelling than empirical evidence, a subject this research returns to in Chapter 2, 3, 5, and 6.

At the time of writing, regional innovation systems theory and theories of knowledge-based development are particularly influential at a conceptual level and in the way they have been diffused and adopted by national and regional policy makers. They represent an amalgam of territorial production and innovation models (agglomeration economies) i.e. new theories of economic geography that have evolved in the context of regeneration theories and growth machine theory which explore the socio-political context in which regional economic policy has evolved. Outlined below are some of the theories and concepts that resonate throughout contemporary regional economic development strategies and plans and

impact the instruments employed in their execution (particularly business incubators, as explored in Chapter 3-5)

'Location' theorists (Weber (1929), Hoover (1937), Greenhut (1956), Isard (1956)) have suggested that firms locate near markets where the monetary weight or price of the final product exceeds the monetary weight or price of inputs required to produce that product and that firms weigh the total costs of production at particular locations when they select a location to operate from. Arguably the theory accords too much importance to transportation costs as a factor of production that now looks increasingly incongruous in service sector dominated economies increasingly integrated by the application of information and communication technologies. However, public investment in infrastructure, particularly business accommodation charged at subsidised rates (business incubators) coupled with other (free or subsidised) business support services (to reduce the costs of factor inputs) is a device that is employed the world over to encourage businesses to locate and/or remain within regions (public (financial) support for inward investors is but another).

'Export Base' theories (Tiebout (1956a, 1956b) and North (1955, 1956)) have postulated that regional growth in local political, economic and social institutions is largely determined by the regions response to exogenous world demand and that it is this response that produces growth. Even a cursory review of the policy literature e.g. regional economic strategies and initiatives concerned with the provision of business support services (and business incubators – there public functions and activities) reveals a concern to support and enable indigenous industry to exploit opportunities in extra-regional markets (national and international).

'Growth Pole' and 'Cumulative Causation' theories have also left their mark in regional economic development strategies and plans. As regards the former, Perroux (1950) emphasises the importance of 'growth poles', a spatial context for Myrdal's theory of cumulative causation (1957) upon which Kaldor (1970) and Dixon and Thirlwall (1975) have expanded and which postulates that increasing returns to scale produces clustering of economic activity within those

regions that are first to industrialise. Dawkins (2003, p.140) suggests however that the notion of growth poles had been 'abandoned in the 1980's due to growing dissatisfaction with the perceived lack of coherence between traditional notions of growth poles and empirical reality'. While this may have been true in academic circles, the notion of growth poles nevertheless persisted in regional economic policies and strategies. Investment continued in the creation and expansion of business incubators in and around 'growth poles' to boost regional economic dynamics in these economic cores continued throughout the 1990s.

The work of Piore and Sabel (1984), proponents of 'Flexible Specialisation and Network Theory', also merits attention when considered with reference to the nature and function of business incubator operations, particularly BICs. Piore and Sabel highlighted the patterns of interrelationships between firms found in new industrial districts and in particular the way in which they draw on flexible labour and capital that can easily be tailored to the needs of changing markets and leverage knowledge and information from highly localized networks bound by trust rather than hierarchical authority relationships found in vertically integrated forms of organization. Again, it has been observed in the course of this investigation that this too is something that business incubators, including BICs, endeavour to foster within their locality.

Theories concerned with economic geography i.e. agglomeration economies; clusters and industrial districts are also particularly noteworthy; they moved centre stage in the 1990s. While Marshall (1920) is generally credited with first highlighting and providing a detailed description of the sources of agglomeration economies in industrial districts with his tripartite classification of knowledge spill-overs, local non-traded inputs and a local skilled labour pool; economic geography received a substantial shot in the arm with the work of Krugman (1991), Porter (1990) and Scott (1988) who noted the role and importance of clustering and agglomeration and the associated scale economy and efficiencies of industrial clustering.

As for the relationship between business incubation and economic geography, much of the public (regional) investment ploughed into business

incubators was linked throughout the 1990s to, or presented as, investment to underpin the development of industrial clusters (directly or indirectly). Then as now, incubators appear with a spatial and sector specific or technology focus to support the development of indigenous industry. Many of the first incubators (often established with a generalist outlook) have evolved a technology focus or specialisation for part if not all their activities (often as a means of attracting additional public investment to support the expansion of their activities). Incubator managers also appear to have become particularly adept at getting business incubation adopted as part of the 'lingua franca' amongst regional policy makers aspiring to develop within regions new industrial clusters as part of their response to industrial restructuring and strategies and plans vis-à-vis economic development and regeneration.

'Industrial restructuring' theories also have a particular resonance when considering the rationale for business incubation and the rate at which they have been adopted as part of regional regeneration initiatives. Industrial restructuring theories explain that fundamental shifts in the organization of industry and labour have resulted in a "deskilling" of the labour force (Harrison 1985), a relative decline in the proportion of workers earning middle-income wages (Leigh 1994), and a spatial stratification of the workforce (Massey 1984). In the context of regional regeneration strategies there was an expectation that incubators would be instrumental in churning out new businesses in such concentrations as to develop new industries and employment opportunities, reskill the labour force, counter the decline of traditional 'heavy' industries and support regional restructuring. As regards business incubation, incubators and BICs in particular have operated a raft of programmes (often supported with EU structural funds) to support the reskilling of the indigenous workforce displaced by new technologies and industrial restructuring.

'Growth Machine Theory' is another seam in the literature that is relevant to out understanding of the context for public sector interventions, particularly with reference to the provision of business support services for indigenous industry and the way in which they are charged with correcting 'market failure's. Molotch (1976) argues that regional growth is a unifying imperative among local political

and economic elites. In this theory, the impetus to pursue a strategy of regional growth does not come from structural economic forces or from the equilibrating tendencies created by exports and trade. Instead, it comes from political coalitions of land-based elites who stand to benefit from local economic development (Wolman, 1996). Political economists such as Buchanan and Tullock (1962) and Frey (Mueller, 2001) have suggested that politicians, primarily concerned with their own welfare, are motivated to instigate and promote policies that will maximise their chance of remaining in office through re-election. Given as, noted by Storey (1994), that the number of small businesses and self-employed people has increased significantly since the end of the Second World War, a concern to provide support measures for the SME sector and thus those employed therein, should not perhaps be surprising given just how potentially significant this 'block' represents in electoral terms.

The notion, however, that 'land-based' elites are instrumental is now somewhat erroneous insofar as it over-states their role in modern regional economic governance and in particular the development of strategy and plans and the instruments designed and implemented to execute them; reflecting changes in modern politics and society; specifically changes in the nature of governance, citizenship and social strata. A modern or rather contemporary perspective would acknowledge that the technocracies or bureaucracies (national, regional and local) that have and continue to evolve as part of the policy making and policy executing process as being more instrumental.

Indeed there is a related but distinct strand in the literature, namely 'the economic theory of bureaucracy' (e.g. Niskanen, 1994) which focuses its attention on government (including regional, local and quasi-government) officials, recognising that – like politicians – state bureaucrats may have vested interests that they seek to pursue through the power that they exercise as part of the policy making/executing process. It is observed in the literature that bureaucrats or rather technocrats[2] who are generally not subject to re-election may, nevertheless, feel under threat – in terms of job prospects, salary, power or other possible variables - if decisions are made to discontinue or substantially change programmes with

which they are associated or responsible. Conversely, their careers are likely to benefit from being associated with high-profile and ostensibly successful initiatives. As noted in chapter 5 and 6, at the time of writing, there appears to be a long-standing bureaucratic consensus, shared confidence in and commitment to, the deployment of business incubators (rooted in the fact that they can be presented as 'flagship' regeneration projects and, moreover, the perception, howsoever rarely validated, that they 'work'). Moreover, the concern or self-interest of the incubator community itself in preserving patronage (political and/or financial) should not be dismissed.

Possible consequences of a situation in which bureaucrats pursue 'rent-seeking' behaviour in order to maximise their own welfare, as noted by (Johnson, 2006) include the establishment of larger and more resource-intensive programmes than might strictly be necessary; over-bureaucratic management and control structures; reluctance to undertake robust evaluations (see chapter 5) and reluctance to curtail ineffective programmes for fear of loss of power or status for the policy makers and possibly loss of jobs or income for people who depend upon the continuation of state funding.

Moreover, it should be noted that the deployment and diffusion of the incubator modality has occurred at a time when the nature of governance, particularly economic governance was changing and responsibility for the design and execution of economic strategies and plans was being increasingly devolved to regional authorities and agencies (Frenz and Oughton, 2005). In the UK, as elsewhere in Europe, this coincided with the evolution of the European Union, the development of EU regional policy and the creation of the structural funds with local attendant regional and local structures that evolved to administer them.

The EU structural funds, as noted in Chapter 3, 4 and 5, have been particularly instrumental in supporting the formulation and execution of economic policy at the regional level and fuelling the proliferation of business incubators (including BICs) providing significant sums for the creation of the infrastructure

---

[2] The word 'bureaucrat' tends to be used pejoratively, not just in the literature but throughout the world, while 'technocrat', which is increasingly used (for the time being) as a descriptor of public servants, seemingly carries no such ire or lack of approbation.

and provision of incubator services (channelled into incubators as part of regional regeneration strategies and plans and on the basis of market failure and boosting regional competitiveness). Moreover, the regional and local technocracies that evolved became increasingly empowered and instrumental in the development of regional economic and strategies and plans negotiated within the framework for national economic and social policy agreed between the EU Commission and national governments. These new technocracies have sought new prescriptions derived on a new appreciation of factor inputs driving and necessary to regional economic growth and development with funding for economic development initiatives often conditional on the same.

It might be argued (and indeed it is a principal contention in the literature concerned with forms of political and economic governance) that leadership as regards policy is increasingly driven from the 'bottom-up' and that it is the technocracies that are increasingly influential within supranational, national and regional forms of governance. Logan et al. (1999), who provide an overview of recent developments in the growth machine literature, conclude that the impact of pro-growth policies is mixed suggesting that the growth machine perspective may be a more useful theory of why political coalitions form than a theory of how growth coalitions affect regional economic outcomes.

'Innovation theories', specifically theories concerned with the geography of innovation and the systems of innovation approach are also increasingly influential in policy terms. As regards the geography of innovation, Marshall (1890) draws a distinction between internal economies that accrue at the level of the firm and external economies that are available to all firms in an industry or region and tend to be realised within a locality and may be sector specific. Internal economies depend on the internal organisation, capabilities and management of the firm while external economies depend upon the overall progress and development of the industrial environment in which firms operate. As for external economies he identified pecuniary external economies, agglomeration economies; pools of skilled labour and what Marshall termed 'industrial atmosphere' which is now more commonly described as R&D or knowledge spillovers. The review of

incubator operations (see Chapters 3, 4 and 5) reveals a concern to foster internal economies within assisted firms and reinforce external economies.

More influential perhaps in contemporary regional economic strategies and plans, particularly those formulated for or by UK Regional Development Agencies, is 'innovation systems' theory. Innovation systems theory is particularly influential in regional policy and can be found in regional economic and innovation strategies the world over. The term 'system of innovation' refers to interactions between different elements in the economy that combine to promote innovation that include firms, infrastructure, institutions (including laws, regulations, rules and habits (Fagerberg, 2005)) and systems of finance, governance and education. Freeman (1987: 1) defines a system of innovation as: 'the network of institutions in the public and private sector whose activities and interactions initiate, import, modify, and diffuse new technologies', while Schumpeter (1951) states that 'innovation capacity is largely dependent upon the construction and institutionalisation of a heterogeneous network of public/private entities that can provide firm-formation expertise, gap funding, seed capital and 'collective entrepreneurship'. According to (Dosi, 2000), relatively few regions have developed the vision, inter-institutional relationships and leadership to transcend existing techno-economic paradigms. However, it is here in systems theory that the relative position of business incubators is most explicitly acknowledged.

Much of the literature concerned with the systems approach has concerned national systems of innovation and is focussed on the role of knowledge and innovation in determining productivity and growth (Lundvall, 1992, Nelson, 1996). As noted by Oughton and Frenz (2005), this is analysed within the context of a socio-economic system that encompasses an interlocking set of factors, including: industrial structure; the education and science system; institutions (North, 1990); finance and governance (O'Sullivan, 1998). Further, it is suggested that it is the very nature of and extent of these linkages between theses factors that determines the dynamics of the system (Grabher, 1993, Granovetter, 1995, Leydesdorff, 2000, Oughton, Landabaso and Morgan, 2002).

This approach has been extended to the identification of regional systems of innovation (integrating the systems of innovation approach and the cluster concept), first introduced by Cooke (1992) and further developed by Morgan, (1997), Braczyk et al. (1998), Baptista and Swann (1998), Cooke et al. (2000), Howells (1999, 2002), Nilsson et al (2003), and Asheim and Gertler (2005) and amalgamating theories on territorial innovation models in a knowledge-based and learning economy (Doloreux, 2002). A regional innovation system is generally defined as the systemic interaction between (1) the regional production structure or knowledge exploitation subsystem which consists mainly of firms, especially where these display clustering tendencies and (2) the regional supportive infrastructure or knowledge generation subsystem which consists of public and private research laboratories, universities and colleges, technology transfer agencies, vocational training organizations, etc (Coenen and Asheim, 2005). This

The 'regional innovation system' as a concept is increasingly influential and has achieved a level of currency in policy terms with regional policy actions increasingly dedicated to factors supporting individual and organizational learning, technology transfer, innovation and business performance, and interactions between public and private sector research and development assets. This has also been observed by Oughton and Frenz (2005), within the regional systems of innovation literature (Saxenian, 1994, Brusco, 1982, 1990, Cooke, 1998, Cooke and Morgan, 1994a, Oughton, Landabaso and Morgan, 2002, Howells, 2002, Asheim and Gertler, 2004) and the related literatures on industrial milieux (Crevoisier and Maillat, 1991, Cooke and Morgan, 1994b).

The innovation systems approach and the importance of knowledge and innovation to regional economic growth and the dynamics of development has captured the imagination of policy makers, particularly regional policy makers seeking to foster the development of an 'innovating region'. Etzkowitz and Kloftsen (2005) define an innovating region as one that has 'the capability to move across technological paradigms and periodically renew itself through new technologies and firms generated from its academic base'. Further, they have postulated that 'innovation policy is created 'bottom-up' as an outcome of 'collective entrepreneurship' through collaboration among business, government

and academic actors – the triple helix' and that 'the emergence of university-industry-government interactions - the triple helix – can also be identified as a key factor in regional development'. The role and contribution of universities to regional economic growth dynamics is a popular theme in contemporary regional economic strategies and is borne on a tide of confidence in theories of knowledge based economic development that have moved centre stage amidst globalisation and pressure on traditional factors of production in developed countries.

While the importance of human capital, knowledge and innovation is integral to notions or theories of knowledge-based development - now increasingly considered key to regional competitiveness - the empirical evidence that elevates the position of universities within regions as a key institution with knowledge spill-overs from these institutions supporting neighbouring firms (Jaffe, 1989), though less so with distant firms (Jaffe, Trajtenberg and Hendersen, 1993) is limited. The regard in which universities are held by policy makers owes perhaps more to the perception that they are a key repository of knowledge and, as such, in a global, 'knowledge-based' economy it is presumed that they have a key contribution to make.

Undoubtedly the profile Massachusetts Institute of Technology enjoys, lauded for its interaction with industry and thus its contribution to the region's economic growth and development, and has been influential in creating expectation as to the potential nature and level of contribution universities might make. The UK government, for example, was prompted to invest £65.1m of public money over a five-year period in the CMIT (Cambridge-Massachusetts Institute of Technology) a partnership between the University of Cambridge and MIT and created with the aim of bringing the entrepreneurial spirit of MIT to British universities and realise their potential contribution to national economic growth. Arguably, the results (economic impact) have been less than impressive, though both the University of Cambridge and MIT are said to have done well out of the arrangement.

Indeed, despite the much vaunted role and supposed contribution of universities espoused in the literature as part of the 'triple-helix', the Lambert

Review of Business-University Collaboration (2003) in the UK provides little, if any, evidential base for this proposition. While universities (in the UK) may be home to a great deal of scientific and technological investigation the degree and extent to which this is applied, successfully exploited or commercialised is uncertain. Moreover, there is little empirical evidence that supports the proposition that universities make a major contribution to the dynamics of regional economic growth (other than as a source of employment and as regards student expenditure in the local economy). Nevertheless, knowledge-based development theories and theories concerned with regional innovation systems hold that universities or rather the interface between universities (and other public infrastructure) and the private sector is increasingly influential in shaping the dynamics of regional economic growth. Indeed, a great many incubators have been established by universities (with the support of regional economic development agencies and other public authorities committed to fostering the development of the interface between universities and the private sector) as part of regional economic strategies and plans.

1.6 Summary

As is evident from the above, regional policy makers can draw upon a wealth of perspectives and propositions from the theoretical literature in formulating regional economic development strategies and plans. While a number of authors have tried to develop models integrating different economic theories, regional policy makers (supranational (EU), national and regional level) have perhaps been more adept, drawing liberally on the notions espoused in the literature, particularly at the conceptual level, in the development of rationales and policy frameworks for public interventions in the regional economy. Figure 1 (below) relates the practice of business incubation through the contemporary economic policy framework to relevant conceptual theory found in the literature.

In macro-economic policy terms, as illustrated in Figure 1, a concern for indigenous industry (industrial and enterprise policy, particularly SMEs) is bound up largely in notions of international competitiveness and interventions to address

market failures. Policy is, however, expressed in somewhat general terms while execution, particularly support for SMEs in the form of business incubation (as explored in Chapter 3) has hitherto been instrument of SME policy practised at the regional level. Increasingly this occurs within a 'fast policy' environment (Peck and Tickell, 2002) wherein new concepts are diffused and adopted (often in the absence of detailed or even compelling empirical evidence that would justify the nature or scale of public investment) by regional policy makers hungry for new solutions and an apparent boundless enthusiasm for new approaches. It is a feature of this 'fast-policy environment' that policy makers are seemingly quick to assume that a notion or concept observed or rather perceived as successful in a specific context may be transplanted and installed in a new environment irrespective of the different factors conditions that prevail therein

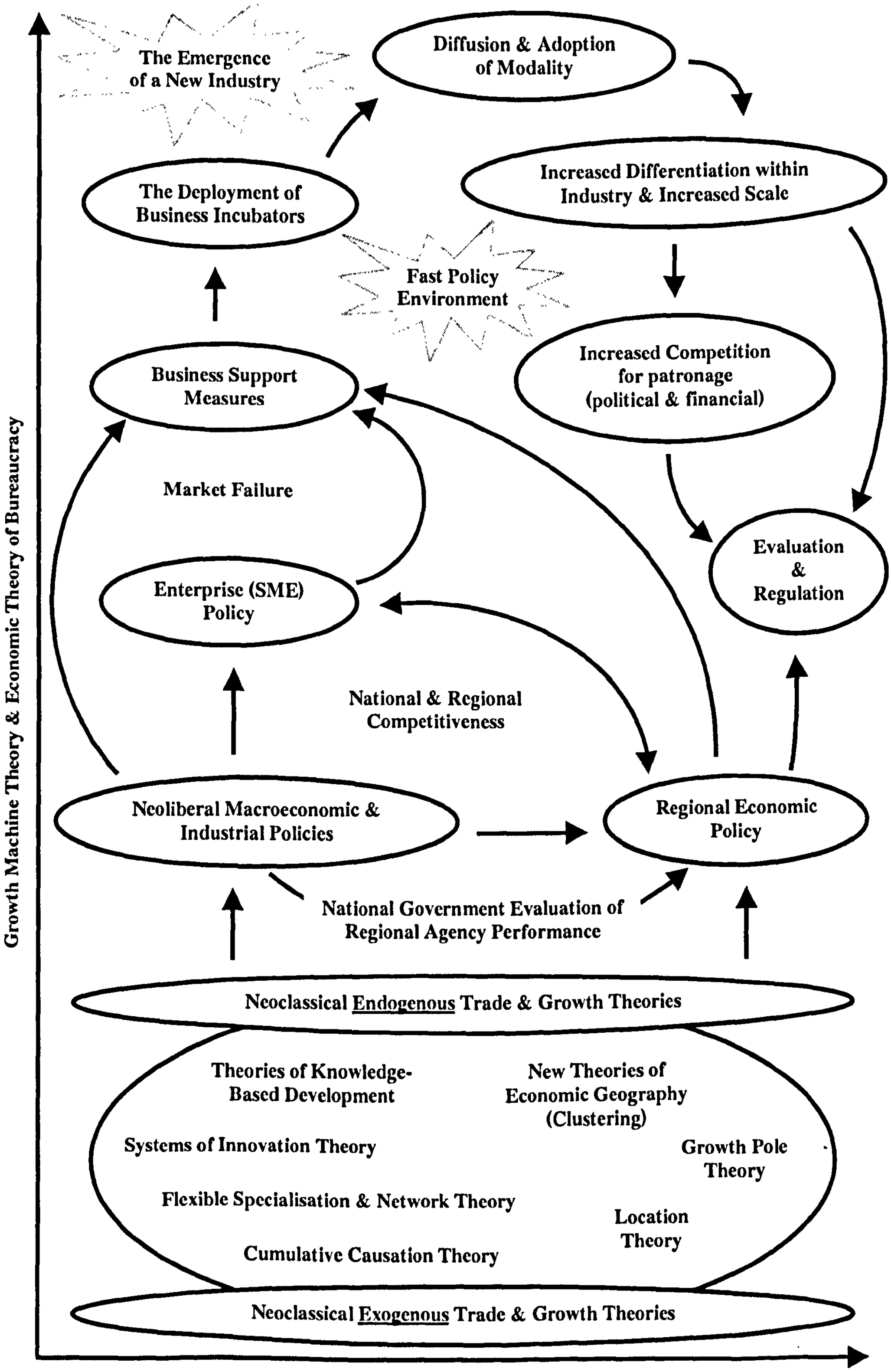
As illustrated in Figure 1, the rate of diffusion and adoption of the incubator modality by policy makers (largely driven in the early stages of the industry by regional policy makers and now increasingly endorsed by national government) and which accounts for increasing levels of public investment given the increased scale of the industry (increasing competition for patronage - political and financial) finds the industry and individual incubators under increasing pressure to produce more compelling rationales, definitions and performance metrics to attract and sustain public sector support. In an industry which is increasingly mature (as evidenced by the creation of national incubator associations, the establishment of business incubation as occupation with attendant professional standards and best practice frameworks) incubators are increasingly concerned to establish and present to stakeholders best practice and communicate achievement.

Irrespective of context, however, SME related policies including the current widespread support for the incubator modality have generally evolved via a process driven by local/regional crises (e.g. industrial restructuring) or underdevelopment, a lack of alternative development models, and as flowing from an expectation that regional and local authorities with direct responsibility for regional economic affairs i.e. regeneration, should be seen to implementing strategies and plans to arrest industrial decline and revitalise their communities.

Moreover, from a review of relevant literature, as illustrated in Figure 1 (below), the increased national scrutiny of regional economic development authorities and associated reporting requirements is likely, in turn, to prompt increased scrutiny of their agents (those executing regional economic, strategies, plans and their instruments). In the UK, for example, regional development agencies are increasingly evaluated against new metrics stipulated by the Department for Trade and Industry (dti), namely 'public service agreements'. In addition, 'best value' performance indicators are being adopted (or imposed) across the public sector – in particular, regional and local government – to assess the return on public investment. The bureaucratic imperative vis-à-vis evaluating the outcome of strategies and plans and, in particular, public investment is forecast below to intensify given the fiscal pressure that the incubator environment shall fall subject; public investment in business incubators is a finite commodity which with the decline of the structural funds and increased competition for such funds as remain (between new and existing incubators and competing approaches) will surely compel regional economic authorities and development agencies to be more rigorous in evaluating the return on their investment.

As illustrated in Figure 1, it is anticipated that evaluation and standardisation or regulation are a foreseeable response to the scope, scale and maturity of the industry and, moreover, the fiscal pressure that will escalate as the industry becomes more competitive and as public funding is stretched to continue to support the proliferation of incubators within the economy. As such, it is also in the interest of the incubator community to develop new and more persuasive metrics (over and above the largely qualitative and anecdotal evidence of achievement) as it competes for public funds and against other approaches as might evolve.

Figure 1: Conceptual Framework



At the time of writing, business incubators (particularly EU BICS) are generally credited with and/or claim a range of qualitative and quantitative effects. As regards an example of the former, BICs are said to have made a meaningful contribution to supporting a move from a top-down approach to regional development (largely characterised by public interventions designed to facilitate transfers of mobile capital and jobs from prosperous or prospering regions to underdeveloped or declining regions), to a bottom-up approach focused on maximising the indigenous potential for economic development (see chapter 4).

However, the literature that 'evaluates' the impact of business incubators, quantitative measures (as applied within or to the incubator community) are rarely properly or adequately descriptive. Indeed, most incubators (European and UK) and external or independent evaluations do not use sophisticated methods or highly quantifiable or comparable techniques to document and/or validate their impact and/or the degree and extent to which they have 'added-value' and rely more on publicising specific success stories. Surprisingly, given the level of public investment in the practise of business incubation in the US, EU and elsewhere in the world, there seems to have been (hitherto) little appetite within or outwith the incubation industry for a more systematic and exacting evaluation that would provide evidence that the level of commitment to business incubation is warranted.

This research has therefore endeavoured to investigate and establish evidence that would justify current levels of confidence and investment in the business incubator modality.

Chapter 2: The Contribution of SMEs to Economic Performance

2.1 Introduction

From a review of the policy literature it is evident that the importance and contribution of SMEs to the national, regional and local 'economic core' (Kirkhoff, 1996) and sustainable development is rooted in economic policy the world over. Governments (supranational, national, regional and local) around the world now actively seek to foster conditions for the growth and development of SMEs as these economic units are considered to enhance economic (country/regional) and industrial (at firm and aggregate level) competitiveness and entrepreneurship and produce external benefits such as 'knowledge spill-overs', economic efficiency, innovation, and aggregate productivity growth.

The political and cultural significance of SMEs has been noted by commentators throughout the world, notably in the US where enterprise is considered integral to the notion of 'the land of opportunity' and is largely symbolic of both political and economic democracy as illustrated by, for example, the US Small Business Administration (SBA) which has stated that: "They [SMEs] keep intact the heritage of ingenuity and enterprise and they help keep the "American Dream" within the reach of millions of Americans"[1].

The political and economic importance of SMEs to the 'American Dream' is acknowledged specifically in US Government policy and is summarised, for example, as follows:

> "Small firms make two indispensable contributions to the American economy. First, they are an integral part of the renewal process that pervades and defines market economies. New and small firms play a crucial role in experimentation and innovation that leads to technological change and productivity growth. Second, small firms are the essential mechanism by which millions enter the economic and

[1] US Small Business Administration retrieved from website: http://www.sba.gov/aboutsba/history/index.html retrieved on 20.06.04

social mainstream of American society. Small business is the vehicle by which millions access the American Dream by creating opportunities for women, minorities and immigrants. In this evolutionary process, community plays the crucial and indispensable role of providing the "social glue" and networking that binds small firms together in both "high tech" and "main street" activities. The crucial barometer for economic and social well being is the continued high level of creation of new and small firms in all sectors of the economy by all segments of society" (US SBA, 1998).

Indeed, Presidential support in the United States for small business is personally identified with the current incumbent:

> "Every new business starts with an idea for a better product or process. These ideas become reality only when confident entrepreneurs are willing to take economic risks. Small businesses are the heart of the American economy because they drive innovation – new firms are established on the very premise that they can do a better job. For innovative small businesses, adequate performance is never good enough and excellence is an endless pursuit. These dynamic companies also drive the job creation process. In fact, small and young companies create two thirds of the net new jobs in our economy, and they employ half of all private-sector workers. Entrepreneurship has become the path to prosperity for many Americans, including minorities and women" (The President's Small Business Agenda, 2005).

Elsewhere and across the world, as explored below, the contribution of SMEs to economic performance is widely acknowledged by nation states and is reflected in industrial policies and their instruments.

2.2 Europe

The contribution of SMEs to the social and economic fabric has been noted, for example, by the European Commission in a variety of EU policies and initiatives, notably the European Council's 2000 Lisbon Strategy wherein the Commission has stated:

> "Europe's competitiveness depends strongly on its small businesses, which are a key source of jobs, a breeding ground for business ideas and a main driver for entrepreneurship" (European Commission, 2003, p.2).

Similarly, the European Charter for Small Enterprises (of the same year), plus the Commission's 2003 Entrepreneurship Action Plan, the Innovation Action Plan, the Competitiveness & Innovation Programme (CIP) and the "SME strand" of the upcoming 7th Framework Programme for R&D (FP7) reflect the socio-economic and political priority accorded SMEs. Further, Enterprise Commissioner Erkki Liikanen (2003, p.1) has stated that:

> "Small and Medium Sized Enterprises form the backbone of the European economy. They are key to entrepreneurial spirit and innovation in the EU and thus crucial to ensure EU competitiveness".

More recently the European Commissioner for Science and Research, Janez Potočnik (2005) has stated:

> "High-tech, new technology-based SMEs are particularly important in terms of their impact and growth potential. They typically carry out their own research and are a key component of the innovation system, facilitating the emergence of new products and markets. Some can grow rapidly to become the large firms of tomorrow while others drive innovation in existing large firms".

These supranational policies, instruments and commitments are reflected in the policy of European nation states endeavouring to engineer or sustain economic growth and ensure economic competitiveness. In Ireland, for example, the National Competitiveness Council (NCC) established by the Government in May 1997 acknowledged (in 1998) that:

> "Apart from contributing to overall growth and employment, SMEs are an essential element of competitiveness. A well-developed and vibrant SME sector will be an important source of innovation. Most new firms begin in the SME sector and they can also be a breeding ground for new products and services. Secondly, the SME sector is a source of strength for the economy as a whole. Because it can offer a wide range of goods and services, larger firms will always have a choice of supplies and markets also. This means that the economy will have the necessary flexibility to cope with fluctuations. If the structure of the economy is a complex one, because of layers of firms that are interrelated, then shocks will lose some of their impact as they move through the economy".

In the UK, SMEs are similarly acknowledged as significant in economic terms by the Performance and Innovation Unit (2001):

> "The UK's 3.7 million SMEs account for approximately 40% of our GDP and have an annual turnover of one trillion pounds. Employing over 12 million people in the UK, they also account for 85% of the 2.3 million extra jobs created by new businesses in the private sector between 1995-99 and more than 50% of the 3.5 million jobs gained from expansion over the same period... [further, they are acknowledged as key to competitiveness insofar as they play] a vital role in the economy, providing new ideas, products, services and jobs".

In a similar vein, in Turkey, the Republic of Turkey Ministry of Industry and Trade's Small and Medium Industry Development Organization (KOSGEB, 2003) states:

> "The Small and Medium Industrial Enterprises (SMEs) form the backbone of any economy. Irrespective of whether one looks at the developed countries of the world, such as USA, Japan and Germany or developing countries such as Thailand, Malaysia and China, a dynamic and vibrant SME sector is playing a key role in the successful economic growth of these countries...a strong SME sector helps achieve many important socio-economic objectives of a country. For example: SMEs are the biggest source of low cost employment; SMEs help in regional and local development; SMEs respond to market fluctuations more easily; SMEs help achieve fair and equitable distribution of wealth; SMEs are key drivers for value-added exports; SMEs assist in fostering a self- help and entrepreneurial culture in the country; [and] SMEs support and complement large scale industries" (p.1).

2.3 Africa

In Africa (specifically, Egypt) "The development of Small and Medium Enterprises (SMEs) in Egypt is considered to be one of the most crucial components of the Government's social and economic development agenda for Egypt" while in South Africa their potential to alleviate poverty (which is now contested by Beck et al (2003) – see below), and the SME contribution to employment (particularly youth unemployment) and the empowerment of a whole demographic or ethnic group is highlighted by the Human Sciences Research Council for the SA Department for Labour (p.13):

> "The development of very small and micro enterprises (VSMEs – those with 10 or less employees) is an important policy priority for South Africa. This priority derives from a number of sources. First, such enterprises are seen as an important generator of employment

and, hence, of poverty alleviation in a country where increasing numbers are likely to find their future work in smaller and informal enterprises. Second, this is reinforced by the particular challenge of youth unemployment. It is estimated that approximately one-third of school leavers will not find formal sector employment or go on to further studies at present (Kraak, 2003). In this climate, the informal portion of the VSME segment of enterprises is seen as a vital vehicle for youth employment. Third, given the historical legacy of white advantage and black disadvantage in South Africa, VSMEs are also seen as a crucial tool for broad-based black economic empowerment. Fourth, given the widespread international claims about the economic importance of entrepreneurship, VSMEs are also considered an integral part of any attempt to construct a more vibrant entrepreneurial culture in South Africa".

2.4 Asia

In South Asia, the Small and Medium Enterprise Development Authority of Pakistan (2005, p.1) states:

> "In the industrial development of a country the importance of the SME sector cannot be overemphasized. SMEs constitute nearly 90% of all the enterprises in Pakistan; employ 80% of the non-agricultural labour force; and their share in the annual GDP is 40%, approximately" while in India, according to Kacker (2005) "small and medium industries play a vital role in the growth of the economy. Small industries have a 40% share in industrial output, producing over 8000 value-added products. They contribute nearly 35% in direct export and 45% in the overall export from the country. They are one of the biggest employment-providing sectors after agriculture, providing employment to 28.28 million people... [and] constitute more than 80% of total number of industrial enterprises and form the backbone of industrial development".

In Korea, the Small and Medium Business Administration (SMBA) highlights the SME contribution to national competitiveness and states that:

> "enhancing the competitiveness of all SMEs is vital to the objective of increasing national competitive power... [and are the] backbone of the Korean economy... SMEs represent 99.8% of entire enterprises (2.95 million SMEs), and 86.7% of total employment (13.09 million employees) in Korea".

Furthermore, they are acknowledged as the:

> "bedrock of Korean industry, because they produce special goods that are impractical for larger enterprises to produce, and because they supply various components for larger enterprises to produce finished goods [further] The speed and flexibility of operation unique to SMEs are behind virtually all production. SMEs are described as continually seeking to develop technological innovations, and to formulate new products for the market. Korea also recognises the role of SMEs in stabilising the social structure, as their presence prevents dramatic imbalances of economic power".

Elsewhere in Asia, specifically in Singapore, the Minister for Home Affairs Mr Wong Kan Seng (2004) stated that:

> "SMEs generate almost 30% of Singapore's gross domestic product and comprise 90% of the total establishments in Singapore. SMEs employ half of the workforce. During the economic recession in 2001 and 2002, the employment of our SMEs rose by 6.6%, in contrast to those of our MNCs which shrank by 1.7%. However, being relatively small, SMEs have inherent disadvantages such as limited bargaining power, market intelligence, economies of scale and resources. As a result, the productivity of our SMEs is generally low - about $48,000 value added per employee per annum as compared to the $149,000 value added per employee per annum among the MNCs".

Interestingly, Singapore's experience, vis-à-vis a 'dip' in the economic cycle mirrors, to an extent, the European recession of 1990-3 wherein, a decline in employment was observed (in Europe) which was found to be greater in large or medium-sized enterprises than in SMEs (suggesting that SMEs are less vulnerable to fluctuations in the business cycle). Indeed, whereas data from the European Observatory of European SMEs (2003) suggests that while employment generally remained more stable in SMEs than LSEs during periods of recession (and that in times of economic recovery, employment growth has tended to be concentrated in the larger enterprises), in Singapore's (albeit more recent) recession SMEs evidently thrived.

In Japan, the Japanese Government has recently legislated to promote the growth and development of SMEs and enhance the economic and social well-being of entrepreneurs, SMEs and their employees in The Small and Medium Enterprise Basic Law (1999). Furthermore, the Japanese Government's recent White Paper (2004) on Small and Medium Enterprises published by the Japanese Government which is entitled 'The Limitless Potential of the Diversity of Small and Medium Enterprises' is illustrative of the way in which SMEs have achieved prominence not only in socio-economic terms but also pre-eminence as a political policy panacea which may be said to have naturally given the social and economic context i.e. in Japan (2002), 99.7% businesses are classified as SMEs now employing 81 percent of the total Japanese workforce. Further, 51 percent of shipped manufacturing goods are produced by SMEs while in the wholesale industry; this figure is 62 percent and in retail represents 73 percent. Evidently, historical data cited in the White Paper illustrates that this picture has changed little in 35 years.

The 2004 White Paper is also particularly noteworthy as it highlights the way in which SMEs may lead a resurgence of Japan Inc and highlights the potentialities of SMEs vis-à-vis their capacity to create new business, lead technological innovation and in their diversity be "engines of economic development". The rationale for the SME focus is also explained by an examination of the rate of growth in total factor productivity in present-day Japanese manufacturing by size and the finding that growth is, on average, higher

in SMEs than large enterprises. This finding is reinforced with reference to the US experience 'In the United States, it has been reported that half of all technological innovation in manufacturing is produced by SMEs'[2] and is presented as part of the rationale for the new policy focus and rationale i.e. SMEs play an active and leading role in technological progress and other forms of technological innovation and are thus key to developing and sustaining national competitive and comparative advantages.

The White Paper is however interesting for other reasons which reveal that the SME contribution to innovation and economic growth is only part of the policy equation (in this way, and in the light of SMEs policies reviewed throughout Europe, the US and countries in transition, the SME policy rationale is strikingly consistent in its coherence and consideration of other social and economic issues.) For example, it notes the way in which SMEs support (and may be instrumental in) the creation of new lifestyles, providing employment opportunities for the elderly and women, supporting the development of new forms of work organization and new working arrangements, and their capacity to reshape (and be integral to) the delivery public services so that they are more attuned to local community needs. Furthermore, it indicates that SMEs are expected to provide solutions to a range of other societal and economic problems which include, for example:

- the need to address anticipated labour shortages (prompted by declining birth rates, the 'opportunity costs of childcare', changes in attitudes toward marriage and birth, female (social and economic) emancipation, and an aging population);
- their capacity to providing employment opportunities for women so that they are able to re-enter the workforce after marriage and childbirth and their potential to facilitate the personal fulfilment of older persons and their independence (financial) - evidently, in Japan, SMEs are more likely to engage older workers or offer older workers and women more flexible

---

[2] The State of Small Business: A Report of the [US] President (1996), which describes how in extremely innovative industries in 1982 (computer equipment and electronic components, etc.), SMEs created approximately the same proportion of technological innovation as large enterprises.

working arrangements, part-time and temporary employment or shorter working hours.

- provide community solutions to local problems that cannot be solved within the conventional framework of public administration (the public sector) and private-sector profit-making enterprises i.e. the role of social/community enterprises and their capacity to provide citizens with opportunities to make contributions to their localities social capital and in ways not readily quantified such as the "stimulation of exchange among local residents"; "improvement of convenience of life of local residents"; "source of local employment opportunities" and "create employment and avenues for personal fulfilment".

2.5 Australasia

In New Zealand SMEs are viewed by, for example, the Ministry of Economic Development (Industry and Regional Development Branch, 2002) as a source of flexibility and innovation, and make a significant contribution to economies, both in terms of the number of SMEs and the proportion of the labour force employed by these firms. The significance of the SME sector in New Zealand is increasing, with further opportunities presented by globalisation and technological development.

In Palestine, SMEs and their development has been highlighted by the United Nations Conference on Trade and Development (UNCTAD, 2004) as being critical in arresting the collapse of the economy to one of subsistence while in Israel the policy rationale highlights not only the SME contribution to economic growth and diversity and innovation but also other contextual and political priorities e.g. the social contribution SMEs can make as providers of employment in peripheral areas and for minorities, women, demobilised soldiers and new immigrants. As noted by Israel's Small and Medium Enterprise Authority:

> "Small and medium-sized business are considered, according to common perception in developed and developing states, an important source for the growth of the economy and for the creation of stable

and, from the economic point of view, healthy places of employment. In Israel, also, therefore, the Government view these businesses as one of the tools for achieving its economic targets and one of the central layers in the Israel economy and society. The chief advantages of small and medium-sized businesses are they are innovative, flexible, and quick to set up at a low cost and with dispersed risk. They are likely to provide an appropriate solution to problems of employment in peripheral areas, as well as among particular populations, such as minorities, women, demobilised soldiers and new immigrants".

2.6 Developing Countries and Countries in Transition

SMEs are considered vital to developing countries wherein "SMEs are the emerging private sector in poor countries, and thus form the base for private sector-led growth" (Hallberg, 2000, p.5) and as acknowledged in United Nations Industrial Development Organisation's (UNIDO) Millennium Development Goals (2004) and countries in 'transition' as explained by Miroslaw Marek, Director of the Department for Crafts, Small and Medium-sized Enterprises (Polish Ministry of Economy):

> "The far-reaching economic reforms that began in Poland in 1989, together with alterations to the political system and changes in the social structure have resulted in rapid development of small and medium size enterprises. Poland puts great importance on to the growth of small and medium size enterprises for several reasons. SMEs form the backbone of the market economy and, as in most other countries create a significant number of new jobs. In addition, support to small enterprises helps in demonopolization, as well as social stability, through the development of the middle class. SMEs development policy presently faces new challenges related to Poland's integration with EU".

The contribution of SMEs to the transformation of centrally planned economies to market economies is noted by Smallbone and Venesaar (1997).

Their contribution in social, economic and political terms has also been noted by the Centre for the Study of Democracy (CSD) an interdisciplinary public policy institute founded in 1989 and comprising a wide and diverse partnership which has declared (reviewing the Bulgarian economy) that:

> "The success of Bulgaria's SME sector is essential to the development of the economy as a whole. Foremost, SMEs are labour intensive and capable of creating many new jobs at low costs. These jobs will be necessary to absorb new unemployment created by restructuring former State Owned Enterprises ("SOEs"). Among other important SME contributions to the economy are:
>
> 1. SMEs service the needs of larger corporations and provide services that facilitate business. One role that SMEs can play is as suppliers to larger companies thus contributing to the external competitiveness of these firms.
> 2. SMEs are a source of innovation on the basis that they are more flexible, more dynamic and more sensitive to shifts in demand than larger firms.
> 3. SMEs contribute as "Seed-Beds" from which large companies can grow.
> 4. SMEs will provide an additional market for the purchase of second-hand equipment from SOEs.
> 5. SMEs train entrepreneurs needed to develop the private sector and foster private investment".
>
> As a result of these factors, the larger and more developed the SME sector, the greater the SME contribution to the growth of the economy. Therefore, it is imperative that during this time of concern, that the Bulgarian authorities take into consideration the role of SMEs in the economic development of the country".

In summary SMEs are, as part of a 'received wisdom', now regarded as integral to social and economic development policies across the globe (in both the

developed and developing world). For example, the OECD Istanbul Ministerial Declaration on Fostering the Growth of Innovative and Internationally Competitive SMEs (2004) acknowledges the importance of small and medium-sized enterprises (SMEs) insofar as they are now the dominant form of business organisation throughout the world, accounting for in excess of 95 per cent of the business population; constitute an important dynamic element in all economies as drivers of innovation, especially in knowledge-based industries; and "play a key role in driving sustainable economic growth and job creation while contributing to the social, cultural and environmental capital of nations".

2.7 The contribution of SMEs to economic performance

The importance of SMEs to the development of national, regional and local economic development, performance and, more generally, the general social fabric is erroneously understood as a modern phenomenon that arose within the last 60 years. Evidently, throughout Europe and the US, SMEs were the pre-eminent economic unit or form (until industrialisation) and were instrumental (in both social and economic terms) in the development of national and regional economies. As noted, for example, by Alexis De Tocqueville in 1835 in his writings on the US "What astonishes me in the United States is not so much the marvellous grandeur of some undertakings as the innumerable multitude of small ones".

Evidently, SMEs prevailed (particularly single unit enterprises generally staffed by and servicing the local communities in which they operated) as the dominant economic form or unit of production and distribution until the emergence of large enterprises in the mid 19th century a transition facilitated by the industrial revolution and the emergence of new technologies, mechanisation and [then] new forms of work organisation (factory production) engineered to achieve economies of scale. The concomitant impact on demographics e.g. urbanisation and the deployment of mechanisation and technology in rural and peripheral areas (in e.g. farming, textiles, fisheries) coupled with the rise of factory production in new industrial centres (the original technology poles) radically altered population

distributions, densities and concentrations of economic activity (and capital) as well as socio-political and socio-economic structures.

As larger enterprises and heavy industry became the significant economic unit or form, leading technological advances and exports, and became symbols of economic superiority neoclassical economists predicted the dominance of large firms, suggesting that they were inherently more profitable than small firms. A central tenet of their thought - economics of scale – an assumption that as the size of the firm increases, the cost of production per unit decreases and the proposition that size is a prerequisite to the achievement of economies of scale and enabled the exploitation of foreign markets and the ability to keep abreast of regulations and new opportunities in technology.

Neoclassical economics prevailed as the mainstream economic for over a century, particularly in the US. Kirchhoff (1994) has suggested that America's adoption of neoclassical theory and the domination of large firms after World War II prompted many Americans to believe that large enterprises would ever be the source of wealth creation and distribution. Indeed, the literature reviewed as part of this study has, historically, seemingly supported the view that SMEs were, in any event, less efficient than their larger counterparts. For example Weiss (1964 and 1976) concluded that SMEs produced at lower levels of efficiency, "On the average, about half of total shipments in the industries covered are from suboptimal plants. The majority of plants in most industries are suboptimal in scale, and a very large percentage of output is from suboptimal plants". As noted by Audretsch (2004) citing Pratten (1971) found similar evidence for the UK, where 'suboptimal' scale establishments accounted for 47.9 percent of industry shipments.

While many scholars were concerned to investigate e.g. (i) whether LSEs and/or SMEs possess advantages derived from their size; (ii) the welfare implications (in economic terms) of a market structure dominated by LSEs (iii) the efficiencies of large-scale production resulting in economic concentration and the public policy implications, others clearly sought to explain how this economic structure had come to pass. For example, William Whyte (1956) postulated that in

the US, this structure and belief or acceptance that this structure was the optimum structure was a product of the depression and military training in WWII which had created a behavioural norm of accepting employment within and obedience to large bureaucracies. Indeed the economic reality of what was the 1950s, 1960s and 1970s, wherein large companies dominated the US economy a period of 'scale and scope' (Chandler, 1990) arguably supported this analysis.

The belief in industrial behemoths exploiting market power, economies of scale and performing as engines of innovative activity was acknowledged by Schumpeter (1942) who stated that "What we have got to accept is that (the large-scale establishment) has come to be the most powerful engine of progress" while Galbraith (1956) stated "There is no more pleasant fiction than that technological change is the product of the matchless ingenuity of the small man forced by competition to employ his wits to better his neighbour. Unhappily, it is a fiction." Indeed, the belief in large corporations and the ability to mobilise and organise labour had become so predominant that John Kenneth Galbraith, in his 1967 book 'The New Industrial State' was prompted to express the hypothesis that large corporations working in coordination with big governments and large labour unions would run nations.

Clearly, the relative importance of SMEs (or perceptions thereof) had evidently declined over time in both North America and Europe. Indeed, in the post-war era, small firms and entrepreneurship were viewed as something of a luxury, perhaps needed by the West to ensure a decentralization of decision making, but in any case only at a cost to efficiency (Weiss, 1976). A range of work conducted in North America and Europe documents a sharp trend towards a decreased role of SMEs during the post-war period (Caves, 1982; Teece, 1993; and Brock and Evans, 1989). The proportion of the 'economically active' that might be classified as self-employed (and thus SMEs) decreased in most Western countries and until the mid to late 1970s, as observed by, for example, Blau (1987) who found that the proportions of both male and female self-employed in the non-agricultural U.S. labour force declined for the main part of the twentieth century (Blau notes however that this decline bottomed out in the early 1970s and started to rise until at least 1982). Indeed, conventional wisdom (post war) predicted that

increased 'globalization'[3] would present a more hostile environment to small business (Vernon, 1970) and that their ability to compete or thrive would be, in any event, naturally constrained. For example, Horst (1972) showed that the propensity to engage in foreign direct investment was a factor of firm size, while Caves (1982) argued that the additional costs of globalization incurred by small businesses would "constitute an important reason for expecting that foreign investment will be mainly an activity of large firms". As summarised by Gomes-Casseres (1997, p.33):

> "Students of international business have traditionally believed that success in foreign markets required large size. Small firms were thought to be at a disadvantage compared to larger firms, because of the fixed costs of learning about foreign environments, communicating at long distances, and negotiating with national governments".

The view that SMEs are intrinsically ill-equipped in the global economy is however put most succinctly by Chandler (1990) who states simply that "to compete globally you have to be big".

However, in the early part of 20th Century, some economists began to question neoclassical theory because it eliminated entrepreneurship from the economic process, effectively denying the role the entrepreneur in the creation and distribution of wealth and the production of new demand in the economic system. Joseph Schumpeter (1934), one of its early critics, considered innovation as key to the creation of new demand for goods and services and particularly entrepreneurs (the owner managers who started new, independent businesses to exploit innovation). To Schumpeter, the entrepreneur initiated the destruction of the

---

[3] Defined by the United Nations Conference on Trade and Development's Bangkok Declaration on 'Global Dialogue and Dynamic Engagement' (February, 2000) as "an ongoing process that presents opportunities; as well as risks and challenges. It has expanded the prospect for technological advances and for effective integration into the international economy... It has increased prosperity and the potential for countries to benefit. However, globalization also raises the risk of marginalization of countries, in particular the poorest countries, and the most vulnerable groups everywhere. Income gaps within and among countries remain wide, and the number of people living in poverty has increased. Asymmetries and imbalances in the international economy have intensified. Instability in the international financial system continues to be a serious problem and requires urgent attention"

existing economic order by introducing new products and services, by creating new forms of organization, or by exploiting new raw materials. Thus entrepreneurs, by exploiting innovations, destroyed the structure of existing markets and caused established firms with older products or services to decline. Schumpeter's dynamic concept of 'creative destruction' recognized that innovation created new demand and that entrepreneurs bring these innovations to the market. Schumpeter considered entrepreneurs to be major mechanisms of wealth creation and distribution in capitalism.

While Schumpeter's analysis had its critics (and admirers) it has gained a greater currency in the last twenty years as economies throughout the world have become increasingly less characterized by the dominance of industrial 'behemoths' or 'monoliths'. Schumpeter's critique of neoclassical theory with its strong belief in market equilibrium and economies of scale and, in particular, its lack of recognition of the impact of entrepreneurship on economic development became more persuasive towards the end of the 20th Century as in the mid-1970s a new economic reality began to undermine the neo-classical interpretation of economics. In the USA, as noted by Brock and Evans (1989), in 1987 the average real GDP per firm which had increased by nearly two thirds between 1947 and 1980 from $150,000 to $245,000 had been largely attributable to the dominance of larger enterprises had fallen by around 14 percent to $210,000, which they observed reflected the re-emergence of SMEs. Similarly, Acs and Audretsch (1990) found that SMEs accounted for one-fifth of manufacturing sales in the USA in 1976, but the small firm share of sales had risen to over one-quarter by 1986. Similarly, in the OECD countries there occurred a structural shift (over time) in these economies from large companies competing through mass production and economies of scale towards smaller companies relying on knowledge, initiative and flexibility.

This new economic reality has promoted ever-greater scrutiny of neo-classical theory and a revived interest in Schumpeter's earlier work. In general, however, a number and/or combination of variables are assumed to have caused this transition, eroding the traditional view of SMEs and their limited potentialities - among them, increased global competition, changes in demand and

demographics, intensified uncertainty and new and radical changes in technology, creating new market opportunities. For example, globalisation increased competitive pressure on manufacturing firms in high-cost locations, which led not only to a shift in production capacity to low cost countries, but also to increasing productivity by using technological inputs. Large firms, as reported by Audretsch (2002), rationalised by restructuring, outsourcing or downsizing and the number of business owners in OECD countries increased from 29 million to 45 million between 1972 and 1998. Meanwhile 'Information and Communication Technologies' (ICTs) gave rise to new markets, such as personal computers, software and ICT-based services, which revolutionised production processes in many industries and led to growth of the service sector.

The transition from the era of Fordist mass production to what has been described variously as a transition to an "information economy" in which the accumulation and exploitation of knowledge is now more important than investment in physical assets (Acs, undated) and/or from a "managed economy" to an "entrepreneurial economy" which is variously characterised by 'turbulence', 'uncertainty' and a larger role for small firms (Audretsch and Thurik, 2001) appears to have taken place between the mid-1970s and the early 1990s. This transition which Jensen (1993, p.835) describes as the "Third Industrial Revolution" reflected structural changes in the economies of Europe which shifted the region's comparative advantage towards knowledge-based activities are noted in Acs (1996 and 1999); Acs and Audretsch, (2001); Audretsch and Thurik, (1997, 2000 and 2001); Audretsch et al., (2000 and 2001); Carree and Thurik, (1997); Carree et al., (1999 and 2000); Thurik, (1995); and Verheul et al. (2001). Further, the economics of this transitional period have prompted a range of explanations. Various aspects and explanations are discussed in Acs (1996), Acs and Audretsch (2001), Acs, Carlsson and Karlsson (1999), Acs, Morck and Yeung (1999), Audretsch and Thurik (2000), Brock and Evans (1989), Carlsson (1992, 1996 and 1999), Carree and Thurik (1997), Carree et al. (2000), Eliasson (1994), Glancey and McQuaid (2000), Loveman and Sengenberger (1991) and Piore and Sable (1984).

Audretsch and Thurik (2001), for example, have postulated that the re-emergence of SMEs and specifically entrepreneurship (in North America and Europe) is derived specifically from increased globalization, which shifted the comparative advantage towards knowledge based economic activity and have characterised managed economies as a natural political, social and economic response to an economy dictated by the forces of large-scale production, reflecting the predominance of the production factors of capital and (unskilled) labour as the sources of competitive advantage and 'entrepreneurial economies' as a political, social and economic response to an economy dictated not just by the dominance of the production factor of knowledge (which Romer (1990, and 1994) and Lucas (1988) identified as replacing more traditional factors as the source of competitive advantage) but also by a very different, but complementary, factor previously overlooked: entrepreneurship capital, or the capacity to engage in and generate entrepreneurial activity, while Brock and Evans (1989) evolved six hypotheses to explain the 'return of the SME':

- Technological change had reduced the extent of scale economies in manufacturing. *It is postulated that new technologies reduced the importance of scale economies in many sectors enabling technology-based SMEs to challenge LSEs reliant on mass production techniques for their competitive advantage (Carlsson, 1989).*
- Increased globalization had rendered markets more volatile as a result of competition from a greater number of foreign rivals.
- The changing composition of the labour force, moving towards a greater participation of females, immigrants, and young and old workers, may be more conducive to smaller rather than larger enterprises, due to the greater premium placed on work flexibility.
- A proliferation of consumer tastes away from standardized, mass-produced goods towards stylized and personalized products creates a niche for small producers.
- Deregulation and privatization facilitate the entry of new and small firms into markets that were previously protected and inaccessible.

- The increased importance of innovation in high-wage countries has reduced the relative importance of large-scale production and instead fostered the importance of entrepreneurial activity.

Elsewhere Traù (2002), who also acknowledges 'the rise of the SME' sector as a global phenomenon, identifies a number of factors that have been instrumental in the development of a new global economic structure which include:

- The need for product differentiation brought about by rising income levels which acts against mass standardization in numerous industries.
- Technological changes that have increased flexibility and made it possible for smaller operations to be competitive. *Jovanovic contends that "recent advances in information technology have made market-based coordination cheaper relative to internal coordination and have partially caused the recent decline in firm size and diversification" (Jovanovic 1993, p. 221) while Meredith (1987) argues that small firms are just as well, or better, equipped to implement technological advances and predicts the factory of the future to be a small factory.*
- Labour unionisation which enhanced the incentive to decentralize operations. *SME creation was fed by the tendency of large firms to concentrate on 'core competences' (Carlsson 1989) and, specifically in the 1980s, corporate spin-offs and divestment (Jovanovic, 1993).*
- Career paths have become much more complex, marked by an increased desire for control over lifestyle choices. *This is said to reflect broader societal changes wherein self-employment (or entrepreneurship) is more highly valued as an occupational choice than before. For example, Kirchhoff (1996) postulates that self-employment is no longer characterized as under-employment or a best or only alternative to employment but a way to achieve a variety of personal goals (not only basic human needs (e.g. physical needs) but also self-realization (Maslow 1970). Indeed, according to Schiller and Crewson (1997) approximately one in four young U.S. workers pursue self-employment as a career choice.*

- The influence of the 1970s oil shocks which made large-scale energy intensive production less sustainable.
- Market deregulation through the gradual dismantling of protectionist regimes which enhanced foreign competition and removed the uncontested position of the large conglomerates of the 1950s and 1960s.
- Increased market uncertainty that worked against huge long-term investments in very large operations.
- Although difficult to document, it is likely the case that the pace of product obsolescence has accelerated and, in the process, fed the forces of creative destruction.
- Public policy has become much more aligned towards stimulating small business and accelerating the pace of business formation over time, particularly in the past decade and right up to the most recent federal government's budget.

While the influence of the 'oil shocks' and 'increased market uncertainty' were not necessarily specific to the large-scale enterprise (LSE) sector, there is otherwise much in Trau's analysis with which to agree.

In summary, and notwithstanding a range of scholarship that has sought to investigate and account for the pre-eminence of SMEs in political, fiscal and policy terms, the commitment to SMEs has generally evolved as a regional response to regional crises (albeit in a 'fast policy' environment – see Chapter 1). In contrast however, it should be noted that the impetus for Japanese policy has seemingly evolved rapidly as part of a national response to the perceived failure of indigenous LSEs (see Chapter 3). Suffice as to say, as noted in Chapter 1 (Figure 1), SME policy and instruments are integral to regional economic development strategies and plans.

2.8 The SME contribution to economic performance in Europe

In Europe, an understanding of the importance of SMEs in social and economic policy terms has evolved slowly, as SMEs have become more prevalent within the demographics of the economic structure - "A political priority in favour of SMEs has gradually developed within the European Union as a result of the job creation potential of SMEs" (European Commission, 1998). As the role of SMEs (see below) has become better understood it has now become integral to European (particularly EU) policy and supranational actions and socio-economic instruments concerned with generating employment, economic growth and securing international competitiveness in a global economy.

As economic units and in demographic terms, prima facie and as illustrated below, SMEs are now the dominant economic unit or form in Europe with micro enterprises accounting for the majority of the SME stock in Europe.

Table 2.1: EU Profile of Enterprise (Data)

Enterprise size class	Number of Enterprises	Relative %
Micro (0-9 employees)	19042000	93.10
Small (10-49 employees)	1202000	5.88
Medium (50-249 employees)	169000	0.83
SME Total	20413000	99.80
LSE (249+ employees)	40000	0.20
Total	20453000	100

Source Data: European Observatory (2003)[4]

Similarly, in the US, the micro enterprise is the most prevalent economic unit, although less so (proportionately) than in the EU. The relative proportion of small firms in the US is however markedly higher.

Table 2.2 US Profile of Enterprise (Data)

Enterprise size class	Number of Enterprises	Relative %
Micro (0-9 employees)	4476451	78.565
Small (10-49 employees)	1001961	17.585
Medium (50-299 employees)	190519	3.343
SME	5668931	99.494
LSE (299+)	28828	0.5059
Total	5697759	100

Source Data: US SBA[5]

Throughout Europe (as illustrated overleaf), particularly in many of the 'less favoured regions' of Europe (which are defined herein as those countries with a GDP less than the EU average) SMEs are clearly significant within the demographics of the economic structure[6].

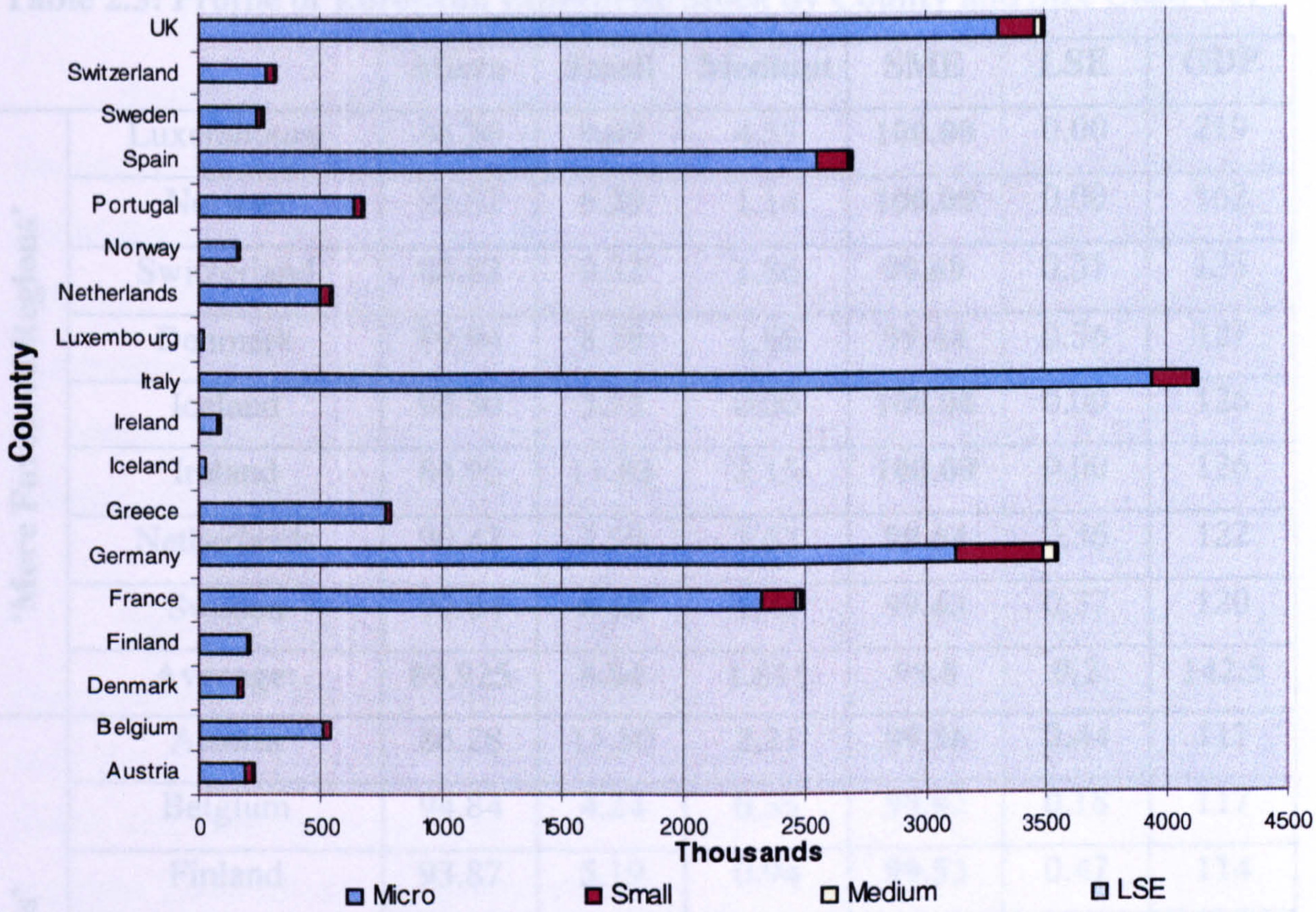
---

[4] Source Data: 'European Commission Observatory of European SMEs (Statistics)' retrieved on 29.11.04 from website: http://www.eim.nl/observatory_7_and_8/en/stats/2001/var1/1cou_size.html

[5] Source Data retrieved on 02.12.04 from US Small Business Administration website: http://www.sba.gov/advo/stats/us_02ss.pdf

[6] GDP per capita was selected as the basis of comparison as this is the principal measure by which a region's economic prosperity is judged by the European Commission vis-à-vis regional policy and the allocation of the EU Structural Funds. For example, regions qualifying as "Objective 1" regions, (covering 22% of the EU population) are so classified because they have less than 75% of the average EU GDP per capita. As this only includes Portugal, Greece and Spain, for the purposes of this research this definition of 'less-favoured region' has been expanded to include those European countries with a GDP per capita less than the EU average.

Figure 2.1: National Stock of Enterprises by Size Class



Source data: European Observatory (2003)[7]

As presented in the table overleaf there are, however, notable differences between the composition of the enterprise stock in 'less favoured' regions from EU regions with a GDP higher than the EU average. Evidently less favoured regions have, on average, a notably higher proportion of Micro sized firms (93.19% of their total enterprise stock compared to 89.92% of more favoured regions).

As regards, small enterprises, these represent 5.77% of the enterprise stock in less favoured regions as compared to 8.04% in regions with a GDP higher than the EU average, while 0.876% of their enterprise stock are medium sized firms compared to 1.81% in 'more favoured regions'.

[7] Source Data: 'European Commission Observatory of European SMEs (Statistics)' retrieved on 29.11.04 from website: http://www.eim.nl/observatory_7_and_8/en/stats/2001/var1/1cou_size.html

Table 2.3: Profile of European Enterprise Stock by County and Size Class (%)[8]

		Micro	Small	Medium	SME	LSE	GDP
'More Favoured Regions'	Luxembourg	86.36	9.09	4.55	**100.00**	0.00	219
	Norway	92.57	6.29	1.14	**100.00**	0.00	162
	Switzerland	88.82	9.32	1.86	**99.69**	0.31	135
	Denmark	89.94	8.38	1.68	**99.44**	0.56	127
	Iceland	96.30	3.70	0.00	**100.00**	0.00	126
	Ireland	84.95	11.83	2.15	**100.00**	0.00	126
	Netherlands	90.42	7.59	1.63	**99.64**	0.36	122
	Sweden	90.04	8.12	1.48	**99.63**	0.37	120
	Average:	**89.925**	**8.04**	**1.811**	**99.8**	**0.2**	**142.5**
'Less Favoured Regions'	Austria	86.28	11.50	2.21	**99.56**	0.44	117
	Belgium	94.84	4.24	0.55	**99.82**	0.18	117
	Finland	93.87	5.19	0.94	**99.53**	0.47	114
	France	93.13	5.71	0.96	**99.80**	0.20	114
	UK	94.58	4.53	0.72	**99.80**	0.20	114
	Germany	88.13	10.23	1.27	**99.63**	0.37	112
	Italy	95.47	4.07	0.39	**99.93**	0.07	111
	Spain	94.70	4.60	0.59	**99.89**	0.11	92
	Greece	97.49	2.13	0.25	**99.87**	0.00	72
	Portugal	93.41	5.56	0.88	**99.85**	0.15	46
	Average	**93.19**	**5.776**	**0.876**	**99.768**	**0.219**	**100.9**

SMEs are therefore, as illustrated above, a significant demographic vis-à-vis the economic structure of both 'less favoured' and 'more favoured' regions. They are therefore naturally accorded attention by policy makers not least because, as explored below, they account for so much of a nation's and region's employment providing a vital contribution to both the social and economic fabric.

[8] Source Data: European Commission Observatory of European SMEs (Statistics)' retrieved on 29.11.04 from website: http://www.eim.nl/observatory_7_and_8/en/stats/2001/var1/1cou_size.html

2.9 SME contribution to Employment

SMEs are lauded across the globe for their potential to make a contribution (social and economic) to the wealth (and more equitable distributions thereof) and health (including political) of nation states and regions, i.e. social and economic cohesion. Consequently, a range of policy instruments have now been developed and deployed by governments world wide to support the SME sector, not only to be competitive in economic terms, but also to achieve a range of social and political objectives as explored in Chapters 3ff.

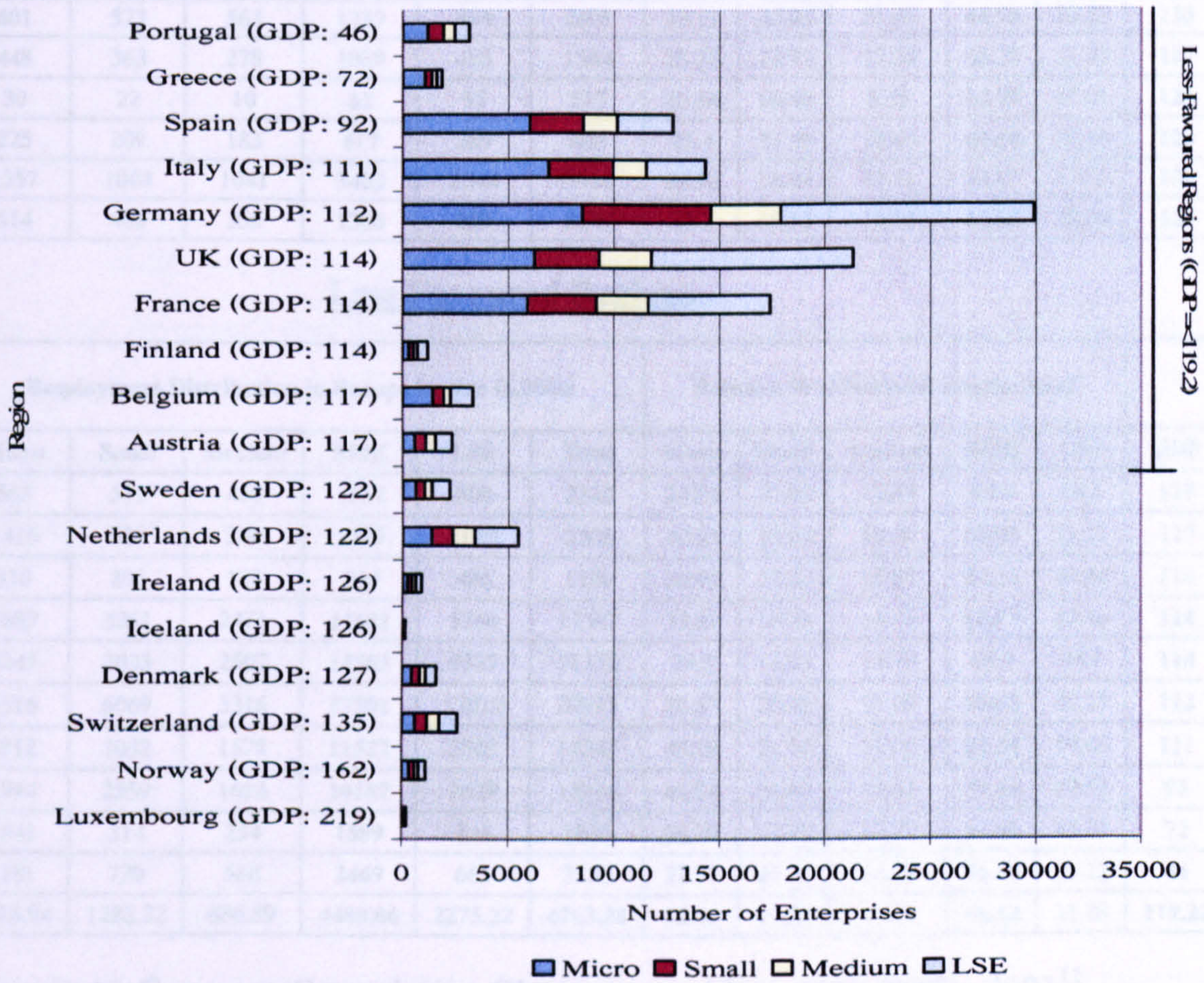
The new policy rationale is not simply a nod to or recognition of the demographics of the economic structure but owes much to the SME share of employment. Systematic international studies examining the re-emergence of SMEs and entrepreneurship in North America and Europe conducted by, for example, Loveman and Sengenberger (1991), and Acs and Audretsch (1993) have found that the relative role of SMEs varies systematically across countries, and secondly, in most European countries and in North America, SMEs began increasing their relative importance as of the mid-1970s and evidently account for a significant share of the active workforce in OECD countries.

For example, in Europe SMEs account for approximately 99.9 percent of all organizations and provide 72 percent of total employment (European Commission, European Network for SME Research, 1997), although some employment share disparities can be observed among European countries (Albors and Kingham, 1998) and as illustrated below. More specifically, in the US, for example, micro enterprises account for 10.976% of employment, while small firms account for 17.71%. Further, as illustrated below, Medium sized enterprises (50-299 employees) account for 17.39% and LSEs 53.91% (US Small Business Administration[9]). In Europe, however, micro enterprises account for significantly higher proportion of employment than the US (34.29% of all employment), small enterprises 18.96% (again higher than the US) while medium sized enterprises (50-249 employees) 13.11% (less than US – although the latter might be explained in

[9] Source Data: US Small Business Administration retrieved on 04.12.04 from website: http://www.sba.gov/advo/stats/us_02ss.pdf

part by difference in classification of Medium sized and LSE). As illustrated below, SMEs (Micro, Small and Medium-sized enterprises combined) account for 66.36% of all employment in the EU and LSEs 33.64%. What is immediately striking from the chart below is the relative concentration of enterprises (SMEs and LSEs) in 5 countries with a GDP less than the EU average (i.e. 'less-favoured' regions) and their relative share of total employment in the EU, as illustrated above, by all size classes of enterprise.

Figure 2.2: Profile of employment in Europe by size class and national GDP



Source Data: European Commission Observatory of European SMEs, 2001[10]

Further, is evident from the data presented below, as regards the demographics of employment 'less favoured' regions have (i) a significantly higher average proportion of total employment in Micro sized firms than 'more favoured' regions (37.41% as compared to 26.27%); (ii) a lesser proportion of employment [average] in small firms (18.92% as compared to 21.11%); (iii) a lesser proportion of employment [average] in medium sized firms (13.76%

[10] Source Data: European Commission Observatory of European SMEs (Statistics)' retrieved on 29.11.04 from website: http://www.eim.nl/observatory_7_and_8/en/stats/2001/var1/1cou_size.html

compared to 18.29%; and (iv) a lower proportion of employment [average] in LSEs (29.91% as compared to 34.33%).

Table 2.4: European SME stock by country, size class and region

More Favoured Regions

	Employment Distribution in Europe by size (1,000s)						Relative % of National Employment					
	Micro	Small	Medium	SME	LSE	Total	Micro	Small	Medium	SME	LSE	GDP
Luxembourg	49	50	52	151	57	208	23.56	24.04	25.00	72.6	27.40	219
Norway	350	230	196	776	321	1097	31.91	20.97	17.87	70.74	29.26	162
Switzerland	601	573	563	1737	864	2601	23.11	22.03	21.65	66.78	33.22	135
Denmark	448	363	278	1089	495	1584	28.28	22.92	17.55	68.75	31.25	127
Iceland	30	22	10	62	55	117	25.64	18.80	8.55	52.99	47.01	126
Ireland	225	209	183	617	269	886	25.4	23.59	20.65	69.64	30.36	126
Netherlands	1357	1004	1041	3402	2044	5446	24.92	18.44	19.11	62.47	37.53	122
Sweden	614	408	358	1380	869	2249	27.3	18.14	15.92	61.36	38.64	120

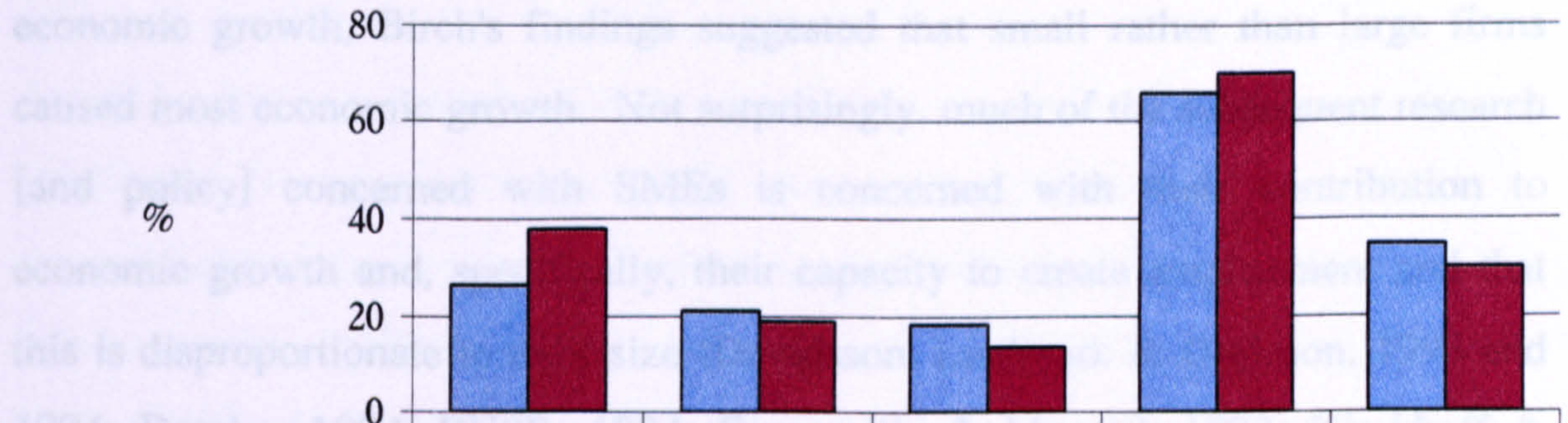
Less Favoured Regions

	Employment Distribution in Europe by size (1,000s)						Relative % of National Employment					
	Micro	Small	Medium	SME	LSE	Total	Micro	Small	Medium	SME	LSE	GDP
Austria	563	511	460	1534	808	2342	24.04	21.82	19.64	65.5	34.5	117
Belgium	1416	517	346	2279	1029	3308	42.81	15.63	10.46	68.89	31.11	117
Finland	310	205	189	704	486	1190	26.05	17.23	15.88	59.16	40.84	114
France	5889	3261	2471	11621	5766	17387	33.87	18.76	14.21	66.84	33.16	114
UK	6245	3033	2507	11785	9527	21312	29.3	14.23	11.76	55.3	44.7	114
Germany	8516	6069	3316	17901	12010	29911	28.47	20.29	11.09	59.85	40.15	112
Italy	6912	3032	1578	11522	2820	14342	48.19	21.14	11.00	80.34	19.66	111
Spain	5994	2559	1614	10167	2629	12796	46.84	20.00	12.61	79.45	20.55	92
Greece	1041	314	234	1589	244	1833	56.79	17.13	12.77	86.69	13.31	72
Portugal	1181	720	568	2469	661	3130	37.73	23.00	18.15	78.88	21.12	46
Average	2318.94	1282.22	886.89	4488.06	2275.22	6763.28	32.46	19.90	15.77	68.12	31.88	119.22

Source Data: European Commission Observatory of European SMEs, 2001[11]

Evidently, SME across Europe account for the dominant share of employment (particularly in less favoured regions) while LSEs account for a higher share of employment in More Favoured Regions than Less Favoured Regions (illustrated below):

Figure 2.3: Average % of Total Employment in the EU (2000) by size class



	Micro	Small	Medium	SME	LSE
More Favoured Regions	26.265	21.11625	18.2875	65.66625	34.33375
Less Favoured Regions	37.409	18.923	13.757	70.09	29.91

Source Data: European Commission Observatory of European SMEs, 2001[12]

SMEs are clearly a significant demographic in social and economic terms (in 'less favoured' and 'more favoured' regions), however, the policy concern to support the SME sector owes much also to the perception that they make a significant contribution to regional economic dynamics - not least their perceived contribution to job creation.

2.10 SME contribution to job creation

The policy focus as regards SMEs and their economic contribution is not rooted simply in the current demographics of employment but also the capacity of SMEs to create employment a fact that was perhaps not particularly well appreciated and understood until the 1980s wherein Birch (1981, p. 8) confounding the conventional wisdom prevailing at the time, found that, 'Whatever else they are doing, large enterprises are no longer the major providers of new jobs for Americans'. Birch's study of all US firms from 1969 through 1976 (1987) discovered that small firms, (firms with 100 or fewer employees) created 81% of the net new jobs in the United States.

---

[11] Source Data: 'European Commission Observatory of European SMEs (Statistics)' retrieved on 29.11.04 from website: http://www.eim.nl/observatory_7_and_8/en/stats/2001/var1/1cou_size.html

As economists generally regard net new job creation as a measure of economic growth, Birch's findings suggested that small rather than large firms caused most economic growth. Not surprisingly, much of the subsequent research [and policy] concerned with SMEs is concerned with their contribution to economic growth and, specifically, their capacity to create employment and that this is disproportionate to their size (Davidsson, Lindmark & Olofsson, 1993 and 1994; Drucker 1994; ENSR, 1994; Fumagellia & Mussati, 1993; Kirchhoff & Phillips, 1998; and Aiginger & Tichy, 1991).

As is evident, however, from a review of both the academic, political, economic and industrial literature, Birch's findings provoked considerable controversy and his data, methodology and application of data has been challenged as have his conclusions (see below). However, while the academic rigour of Birch's work was challenged, his work nevertheless underpinned a reorientation of industrial and regional policies in which SMEs were accorded a central role. Birch's findings had an additional resonance, given the persistent and relatively high unemployment rates observed in most OECD countries in the early 1990s which elevated employment and policy approaches to developing employment opportunities at the heart of public policy (OECD, 1997; Schreyer, 1996). According to Burrows (1991), Birch's 1979 findings were instrumental in persuading the Thatcher administration to create an 'enterprise culture' in the UK (see Bridge *et al*, 1998). Further, a subsequent analysis of SBA data from 1969 through 1990 demonstrated that firms with 100 or fewer employees were the primary creators of net new jobs in the United States[13] thus cementing the SME as a central concern for industrial policy and further undermining the completeness of neoclassical theory and giving added credibility to Schumpeterian economic interpretations i.e. that small firms through innovation rather than large firms through economies of scale cause economic growth.

In Europe, methodologies similar to Birch's were applied which evidently not only supported a reorientation of industrial policy in the EU nation states (e.g.

---

[12] Source Data: 'European Commission Observatory of European SMEs website (Statistics)' retrieved on 29.11.04 from website:
http://www.eim.nl/observatory_7_and_8/en/stats/2001/var2/1cou_size.html

the UK) but reinforced and seemingly validated the new approach to industrial policy in the US insofar as SMEs became not just as an added or peripheral dimension but as a central policy concern[14]. For example, Gallagher and Stewart (1986) and Storey and Johnson (1987) found that small enterprises (in the UK) created most of the new jobs. Further, Storey (1994) reviewing US and UK job creation studies by Birch, (1979); Armington, et al (1982); Gallagher et al (1986); Birch (1987); Gallagher et al (1987), and Gallagher et al (1991) concluded that while the SME contribution to job creation may have been overstated in Birch's original 1979 study, SMEs were nevertheless a significant source of job creation. Subsequent research by Konings (1995) found that that the gross job creation rate was highest in small establishments and lowest in large establishments and, by contrast, that the gross job destruction rate was lowest in small establishments and highest in large establishments while an OECD review of the contribution of SMEs (Schreyer, 1996) also concurred as the importance of the SME contribution to job creation.

However, the nature and precise extent of the SME contribution to employment and economic performance has and is still the subject of 'debate' (Harrison (1995); Acs, (1995); Storey, (1995); Davis, et al, (1996); Davidsson et al (1996) and has formed the subject of a 1996 OECD review). In general there is, however, (and notwithstanding significant levels of dissent – see below) a wealth of empirical evidence from the literature that seemingly supports the small business generator thesis: job creation rates fall with firm size in Australia (Williams, 1989), Canada (Picot *et al.*, 1994; Baldwin and Picot, 1995), Denmark (Leth-Sorensen and Boegh-Nielson, 1995), Finland (Lumme, 1996), Germany (Wagner, 1995), the Netherlands (Broersma and Gautier, 1997), Sweden (Davidson, 1995), the United Kingdom (Doi and Cowling, 1998; Gallagher *et al.*,

---

[13] Handbook of Small Business Data, 1994 edition, U.S. Small Business Administration

[14] Just as it is argued that Birch's work energised policy and a change in the focus of industrial policy in the US, Owen argues that a study carried out by the American management consultants, Arthur D. Little was particularly instrumental in the UK in changing industrial policy and which highlighted the dearth of fast-growing, technology-based firms in Britain compared to the US. In 'New Technology-Based Firms In The UK And The Federal Republic Of Germany, A Report For The Anglo-German Foundation For The Study Of Industrial Society' (1977) is was reported that the number of new technology-based firms set up in Britain since 1950 and still in existence in the mid-1970s was estimated at about 200, compared to several thousand in the US.

1990), and the United States (Davis *et al.*, 1994; Birch *et al.*, 1993); so do net job rates, according to most of these studies as explored and reviewed by Schreyer:

Table 2.5: SME contribution to Job Creation

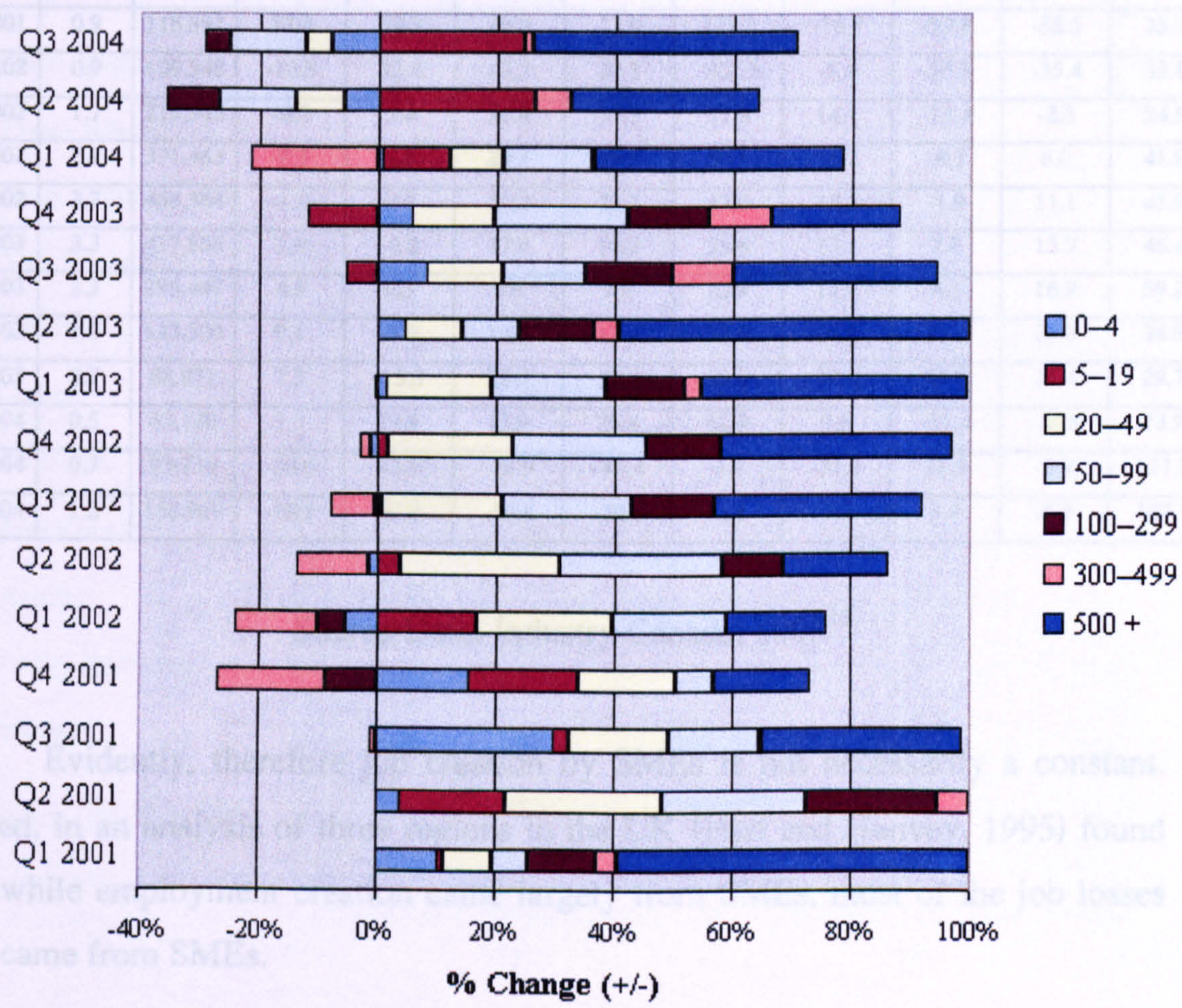
Country/Author	*Gross* job creation rates	*Net* job creation rates
Canada: Picot, Baldwin, Dupuy (1994)	fall with [increased] firm size	fall with [increased] firm size
United States: Haltiwanger (1995)	fall with [increased] firm size	fall with [increased] firm size
United States: Dennis et al.	fall with [increased] firm size	fall with [increased] firm size
United States: OECD (1995)	fall with [increased] firm size	fall with [increased] firm size
Japan: OECD (1995)	fall with [increased] firm size	no systematic relationship
Denmark: Leth-Sorensen, Boegh-Nielsen (1995)	fall with [increased] firm size	only micro-firms show high net job creation rates - no systematic relationship for other size classes
Germany: Wagner (1995)	fall with [increased] firm size	highest net job creation rate in 20-49 size class
Netherlands: Broersma and Gautier (1995)	fall with [increased] firm size	job creation rates in firm with less than 100 employees exceed job change rates of firms with more than 100 employees
Sweden: Davidsson (1995)	fall with [increased] firm size	smallest firms show largest net creation and destruction rates
United Kingdom: Gallagher et al.	fall with [increased] firm size	highest net job creation rates for micro enterprises, weaker performance of 20-49 size class

Adapted from Source: Schreyer, P., (1996)

This research might be contrasted, however, with data recently produced on the other side of the Atlantic in Canada. While between the second quarter of 1996 and the second quarter of 1997, Canadian firms created 580,000 net new jobs and SMEs accounted for 81 percent of this net job growth (Industry Canada, 1998) an examination of data concerning the number of jobs created between the fourth quarter 2003 and the fourth quarter of 2004 wherein approximately 161 000 net

jobs (payroll jobs) were created reveals this growth in employment in the period was largely generated by large firms (those with 500 employees and over), which accounted for 101 percent of net job creation, while SMEs both lost jobs.

Figure 2.4: % Contribution to Total Net Change by Size of Firm (Number of Employees), Canada 2001-2004



Source Data: Industry Canada, 2005

It is evident, from the data (below), that only small businesses with 5–19 employees contributed to net job creation (59 percent) but these gains were offset by the employment decrease in the other categories of small business.

Table 2.6: Quarterly Net Change in Payroll Employment by Firm Size, Canada, Q1 2001 to Q3 2004

	Total Net Change		% Contribution to Total Net Change by Size of Firm (Number of Employees)								
	%, y/y	Jobs, y/y	0–4	5–19	20–49	50–99	0–99	100–299	300–499	100–499	500 +
Q1 2001	3.7	445,716	10.2	1.3	8.2	6.1	25.8	11.4	3.6	15.0	59.2
Q2 2001	2.8	344,534	2.0	8.8	13.3	12.1	36.1	11.0	2.7	13.7	50.1
Q3 2001	1.8	220,349	30.4	2.6	17.3	15.8	66.1	0.1	-1.0	-0.9	34.8
Q4 2001	0.9	118,891	33.4	39.9	36.0	13.9	123.2	-18.7	-39.8	-58.5	35.3
Q1 2002	0.9	109,548	-10.5	32.4	43.3	37.1	102.3	-8.6	-26.8	-35.4	33.1
Q2 2002	1.7	219,942	-2.2	5.4	36.8	37.7	77.8	14.1	-16.4	-2.3	24.5
Q3 2002	2.9	371,463	-0.5	1.0	24.1	25.5	50.1	16.7	-8.7	8.0	41.9
Q4 2002	3.7	468,364	-1.0	2.0	22.3	23.7	47.0	13.1	-1.9	11.1	41.9
Q1 2003	3.3	417,855	1.6	-0.2	17.6	19.7	38.6	13.1	2.8	15.9	45.4
Q2 2003	2.3	295,447	4.5	0.3	9.6	9.5	23.9	12.4	4.5	16.9	59.2
Q3 2003	1.0	133,500	9.1	-5.9	14.3	15.7	33.1	16.6	11.4	28.0	38.9
Q4 2003	0.7	88,971	7.3	-15.3	18.5	29.4	39.9	17.6	13.8	31.4	28.7
Q1 2004	0.5	63,120	1.3	19.9	15.9	25.8	62.9	0.6	-37.4	-36.8	73.9
Q2 2004	0.7	93,736	-20.0	92.5	-28.9	-45.4	-1.7	-31.3	21.3	-9.9	111.7
Q3 2004	1.2	158,969	-18.7	59.0	-10.6	-30.6	-0.8	-9.7	3.4	-6.3	107.1

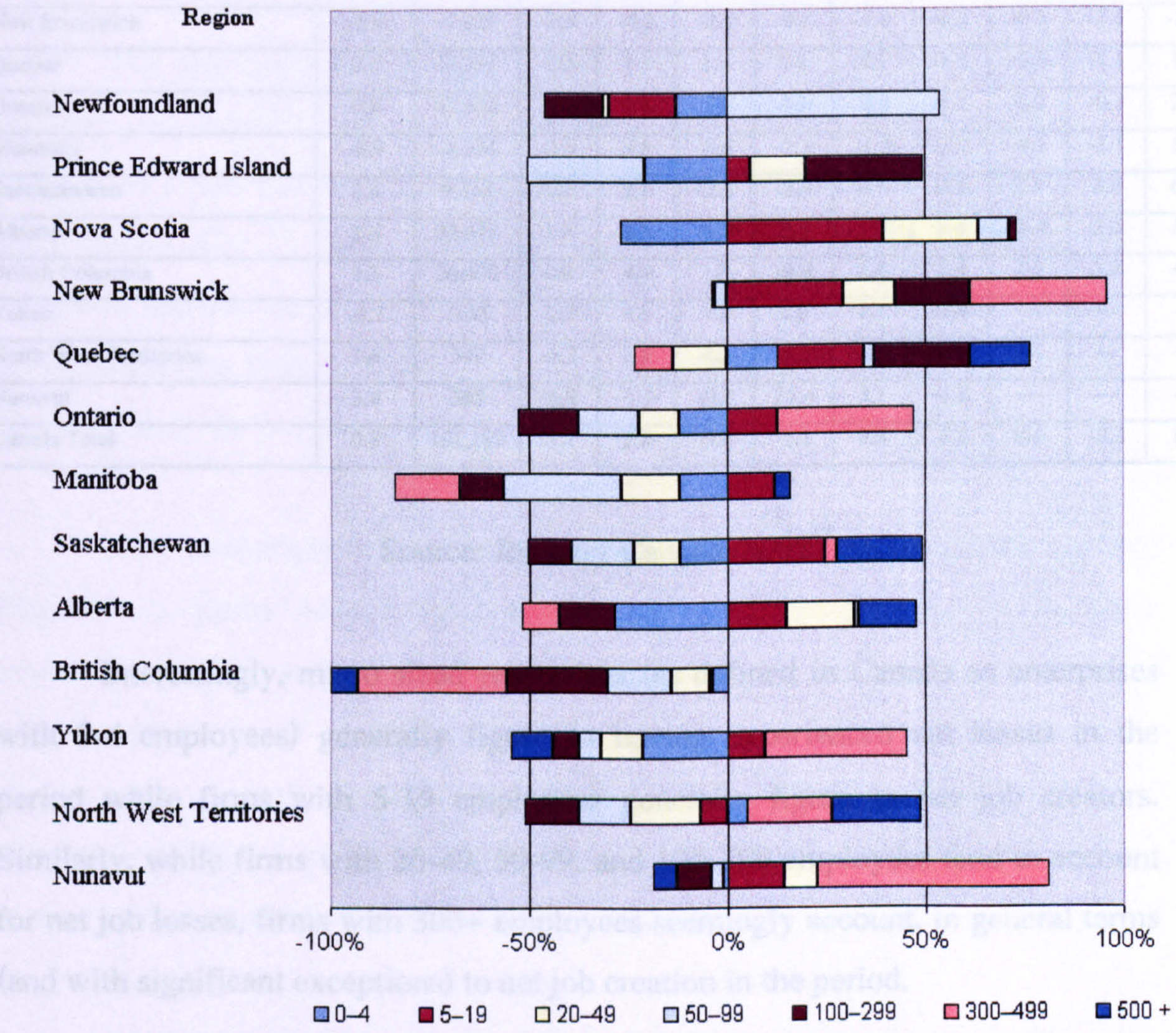
Source Data: Industry Canada, 2005[15]

Evidently, therefore job creation by SMEs is not necessarily a constant. Indeed, in an analysis of three regions in the UK (Hart and Hanvey, 1995) found that while employment creation came largely from SMEs, most of the job losses also came from SMEs.

[15] Source Data: Industry Canada retrieved on 28.01.05 from Statistics Canada website: Survey of Employment, Payrolls and Hours, December, 2004. http://strategis.ic.gc.ca/epic/internet/insbrp-rppe.nsf/en/rd01030e.html

Moreover, significant degrees of variation have also been noted between countries and regions (Keeble and Walker, 1994; Kidd and Gallagher, 1994; Hart and Hanvey, 1994; and Storey, 1994) and as illustrated below by the Canadian data:

Figure 2.5: % Contribution to Total Net Change by Size of Firm (Number of Employees) by region (Canada, 2001-2004)



Source: Industry Canada, 2005[16]

As is evident from the data table and illustration above, there are significant degrees of variation between regions.

---

[16] Source Data: Industry Canada retrieved on 28.01.05 from Statistics Canada website: Survey of Employment, Payrolls and Hours, December, 2004. http://strategis.ic.gc.ca/epic/internet/insbrp-rppe.nsf/en/rd01030e.html

Table 2.7: % Contribution to Total Net Change by Size of Firm (Number of Employees) by region (Canada, 2001-2004)

Year-over-year Annual Net Change in Payroll Employment by Province and Territory and Firm Size, Four-quarter Averages, Q4 2002 to Q3 2004	Total Net Change		Growth Rates (%) by Size of Firm (Number of Employees)								
	%, y/y	Jobs, y/y	0–4	5–19	20–49	50–99	0–99	100–299	300–499	100–499	500 +
Newfoundland	0.2	441	-0.4	5.8	3.2	-1.2	2.7	-3.6	23.6	3.8	-2.3
Prince Edward Island	0.9	574	1.0	-1.4	-3.5	-2.7	-1.8	-2.7	4.3	-0.7	4.6
Nova Scotia	-0.8	-3,170	-3.0	1.3	-1.5	-0.8	-0.7	-0.9	5.1	0.6	-1.5
New Brunswick	-2.4	-7,227	-0.9	-0.2	-2.4	-4.0	-1.6	-6.2	-9.3	-7.1	-1.7
Quebec	0.6	17,311	-2.5	1.3	1.5	0.1	0.5	-1.2	-0.8	-1.1	1.3
Ontario	0.9	43,582	-1.2	2.5	-1.2	-1.6	-0.1	-1.1	0.3	-0.7	2.2
Manitoba	-0.9	-4,456	-3.0	3.0	-3.6	-7.3	-2.2	-2.7	-4.1	-3.1	1.0
Saskatchewan	2.4	9,396	-2.7	2.8	-2.2	-3.4	-0.7	-3.3	7.7	0.0	6.4
Alberta	1.6	23,672	1.8	3.1	-1.9	0.4	1.0	3.4	-1.4	2.0	2.2
British Columbia	1.3	20,470	0.0	4.0	1.8	-0.4	1.8	2.6	4.8	3.2	-0.1
Yukon	-0.7	-105	-2.7	4.0	2.4	0.8	1.7	0.2	—	—	—
North West Territories	1.6	347	-6.3	1.8	4.3	-9.1	-0.7	9.1	—	—	—
Nunavut	3.4	365	-6.0	-7.9	-0.8	25.4	3.1	-6.8	—	—	—
Canada Total	0.8	101,199	-1.1	2.4	-0.3	-1.1	0.3	-0.5	0.6	-0.2	1.5

Source: Industry Canada, 2005[17]

Interestingly, micro sized enterprises (as defined in Canada as enterprises with 0-4 employees) generally figure as having experienced net losses in the period while firms with 5-19 employees generally figure as net job creators. Similarly, while firms with 20-49, 50-99, and 100-299 employees tend to account for net job losses, firms with 300+ employees seemingly account, in general terms (and with significant exceptions) to net job creation in the period.

In a similar vein, the UK's Trade Union Congress (TUC) economic report 'Small firms – myths and realities' (2003) has challenged research that has given rise to the presumption the small firms are responsible for job creation and that a large SME sector is now critical for a successful economy on the grounds that the facts of these matters have been obscured until relatively recently by "a lack of hard statistical data" (page 1) and a failure to properly account for the SME

[17] Source Data: Industry Canada retrieved on 28.01.05 from Statistics Canada website: Survey of Employment, Payrolls and Hours, December, 2004. http://strategis.ic.gc.ca/epic/internet/insbrp-rppe.nsf/en/rd01030e.html

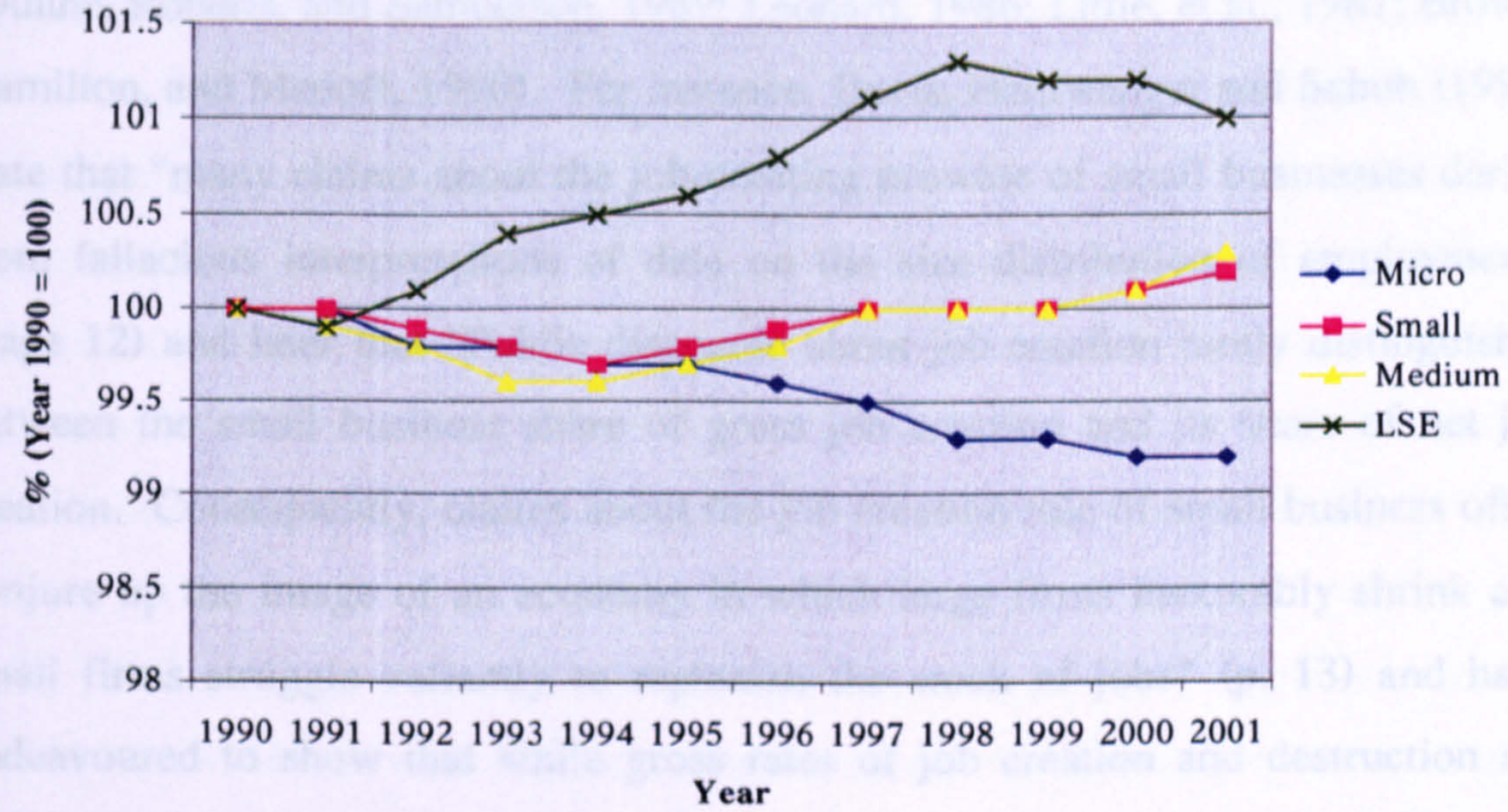
contribution to 'job destruction'. Comparing the figures for total employment (averages) for 1994-1996 and 1999-2001, the authors of the report found that "over this period total employment in SMEs had changed little, increasing by less than 2 per cent. In contrast, almost all the increase in total private sector employment has been in large firms, with an increase of 17 per cent. The share of total private sector employment in SMEs has fallen from 52.3 per cent in 1994-1996 to 47.7 per cent in 1999-2001".

The presumption that SMEs make the most significant contribution as regards job creation (and an acknowledgement of their contribution to 'job destruction') has also been explored in the EU Observatory of European SMEs 2003 Report (No. 7 - SMEs in Europe 2003), which found that during the 1990-3 recession, the decline in employment was found to be greater in large or medium-sized companies than in SMEs, thus suggesting that SMEs are less vulnerable to fluctuations in the business cycle.

This seemingly mirrors Singapore's experience as explained by the Minister for Home Affairs Mr Wong Kan Seng (2004) "During the economic recession in 2001 and 2002, the employment of our SMEs rose by 6.6%, in contrast to those of our MNCs which shrank by 1.7%". Evidently, while employment generally has remained more stable in SMEs during periods of recession, in times of economic recovery, however, employment growth has tended to be concentrated in the larger enterprises.

As may be observed, for example, from European data for the period 1990-2001 (as illustrated below) and during and following the recession of 1990-1993, LSEs were seemingly getting bigger while the average size of micro-firms declined:

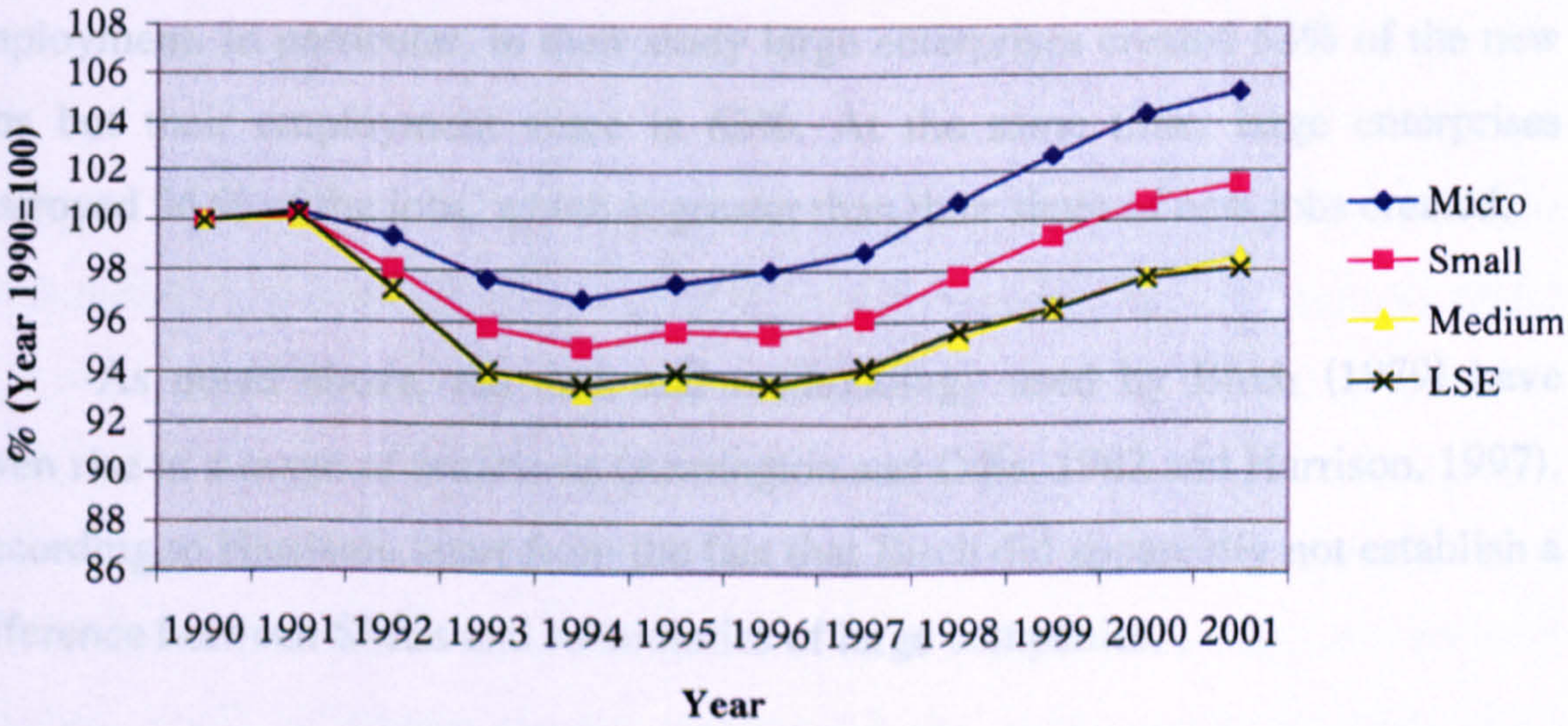
Figure 2.6: Profile of % Change in Employment/Enterprise in EU 19 (by Enterprise Size Class) 1990-2001



Source Data: European Commission Observatory of European SMEs, 2001[18]

However it should be acknowledged that in Europe while the average size of micro-sized firms decreased, their number nevertheless increased during this period.

Figure 2.7: Profile of Employment in EU 19 by Enterprise Size Class, 1990-2001



Source Data: European Commission Observatory of European SMEs, 2001[19]

[18] Source Data: 'European Commission Observatory of European SMEs (Statistics)' retrieved on 29.11.04 from website: http://www.eim.nl/observatory_7_and_8/en/stats/2001/var4/4e19.html

There is in fact an array of scholarship that contests and rejects the view that small firms are the engines of job formation - or that their role is over-stated - (Dunne, Roberts, and Samuelson, 1989; Leonard, 1986; Little, et al., 1987; Brown, Hamilton, and Medoff, 1990). For instance, Davis, Haltiwanger and Schuh (1993) state that "many claims about the job-creating prowess of small businesses derive from fallacious interpretations of data on the size distribution of employment" (page 12) and later that "Public discourse about job creation rarely distinguishes between the small business share of gross job creation and its share of net job creation. Consequently, claims about the job creation role of small business often conjure up the image of an economy in which large firms inexorably shrink and small firms struggle valiantly to replenish the stock of jobs" (p. 13) and have endeavoured to show that while gross rates of job creation and destruction are higher in small firms, there is no systematic relationship between *net* job creation and firm size.

Davis, Haltiwanger and Schuh's critique of Birch's original work has itself however attracted its own share of criticism from e.g. Davidsson, P. (1995). More recently, however, Davis, Haltiwanger and Schuh (1996) having "corrected for the regression to the mean fallacy" they claim is inherent in Birch's results in estimating employment generation for the U.S between 1972-1988 nevertheless conclude that SMEs do in fact account for more than their share of new employment. In particular, in their study large enterprises created 53% of the new jobs but their employment share is 65%. At the same time, large enterprises destroyed 56 % of the jobs, which is greater than their share of new jobs created.

As noted above, the data and methodology used by Birch (1979) have given rise to a range of criticisms (Armington and Odle, 1982 and Harrison, 1997). According to Harrison, apart from the fact that Birch did apparently not establish a difference between SMEs and subsidiaries of large companies,

---

[19] Source Data: 'European Commission Observatory of European SMEs (Statistics)' retrieved on 29.11.04 from website: http://www.eim.nl/observatory_7_and_8/en/stats/2001/var2/4e19.html

Harrison also criticised Birch for failing to illuminate the fact that most employment was created by only a small proportion of firms, i.e. fast growing firms (which Birch subsequently 'corrected' in 1987 wherein he coined the term for such firms - "gazelles"). Evidently several studies, both European and American have seemingly confirmed this phenomenon i.e. that job creation is not uniform across or within the size classes of enterprise. In a study on the European Economic Community, Storey and Johnson (1987) observed that over a period of 12 years, less than 10% of firms created at the start of the period had grown beyond 20 workers and less than 1% of them had surpassed 100 workers.

Furthermore, an OECD study (1999) illustrated that within the reference period job creation was not a constant across regions and that significant disparities vis-à-vis the contribution of SMEs to employment existed across Europe. For example, the number of SMEs with between 20 and 500 employees that had doubled their employment only represented between 2% and 10% of the surviving firms, but had generated between 48% and 88% of new employment created by this type of firm in France, Italy, the Netherlands, Spain and Quebec. Indeed, a review of the literature reveals that number of studies in Germany, Greece and Sweden (Julien, 2000), Ireland (O'Farrel, 1984), the United States (Dunkelberg and Cooper, 1982), Canada (McMullan and Vesper, 1987) and some regions in the United Kingdom (Gallagher and Miller, 1991) have seemingly confirmed these observations.

In summary, there has been and continues to be forthright criticism of the scholarship and policy rationale for SME support based on their capacity to create jobs which some have dismissed as a 'myth'. For example, as according to Postrel (1994, p.1) "Small business is, apparently, the opposite of the weather: Everybody praises it, and everybody does something about it. But all this posturing is based on bad economics and worse politics. Contrary to endlessly repeated conventional wisdom, small companies do *not* account for the vast majority of new jobs". Moreover, the policy rationale for SME support based on their social and economic contribution as regards their ability to create employment has also been critiqued at a qualitative level i.e. in terms of job quality. There is, for example, microeconomic evidence that does not support the pro-SME view that small firms

create better quality jobs than large firms. Research undertaken in the US and Europe has found a systematic and positive relationship between employee compensation and firm size (Brown and Medoff, 1989; Brown et al 1990). Indeed, an array of empirical evidence would seem to indicate that LSEs offer more stable employment, higher wages and more non-wage benefits than SMEs in developed and developing countries, even after controlling for differences in education, experience and industry (Brown, Medoff and Hamilton, 1990; and Rosenzweig, 1988).

Notwithstanding such dissent, vis-à-vis the SME contribution to job creation and/or the quality of jobs created, the political commitment to SMEs – perhaps surprisingly - remains undimmed and they remain central to economic strategies and plans the world over. Unshakeable in their conviction, policy makers continue to accord SMEs a pivotal role in economic development and regeneration policy still very much predicated on their capacity to create employment. Moreover, another 'front' has opened up in the SME debate vis-à-vis their relative contribution to economic development and competitiveness, namely their capability and capacity to innovate.

2.11 SMEs and innovation

It has been postulated that big businesses, profiting from "economies of scale," are more naturally efficient and, by their nature, are more innovatory (more naturally equipped to be so), i.e. innovation is a factor of size (see Pagano and Schivardi (2001) reviewing innovatory activity in Europe). Indeed, until relatively recently, the conventional wisdom (e.g. Chandler (1990) who concluded, 'to compete globally you have to be big') has stipulated that SMEs are inherently disadvantaged insofar as they have a deficit of knowledge assets which constrains their ability to generate innovative outputs and be as competitive as LSEs. Schumpeter, for example, has suggested in *Capitalism, Socialism and Democracy* (1942, p.101) that it is in fact "The monopolist firm [that] will generate a larger supply of innovations because there are advantages which, though not strictly unattainable on the competitive level of enterprise, are as a matter of fact secured only on the monopoly level". Similarly, Galbraith (1956) has argued "Because

development is costly, it follows that it can be carried on only by a firm that has the resources which are associated with considerable size" while Nelson (1959) submits that larger firms are more likely find an economic application for their innovation. Similarly, Scherer (1991) notes that larger firms are endowed with economies of scale vis-à-vis promotion and in distribution, facilitating the penetration of new products and the achievement of greater returns on investment in innovation.

There are those, however, that have questioned what has, prevailed, until relatively as 'received' or 'conventional wisdom' and would now assert the contrary. For example, Scherer (1988, pp. 4-5) submits:

> "Smaller enterprises make their impressive contributions to innovation because of several advantages they possess compared to large-size corporations. One important strength is that they are less bureaucratic, without layers of 'abominable no-men' who block daring ventures in a more highly structured organization. Second, and something that is often overlooked, many advances in technology accumulate upon a myriad of detailed inventions involving individual components, materials, and fabrication techniques. The sales possibilities for making such narrow, detailed advances are often too modest to interest giant corporations. An individual entrepreneur's juices will flow over a new product or process with sales prospects in the millions of dollars per year, whereas few large corporations can work up much excitement over such small fish, nor can they accommodate small ventures easily into their organizational structures. Third, it is easier to sustain a fever pitch of excitement in small organization, where the links between challenges, staff, and potential rewards are tight. 'All-nighters' through which tough technical problems are solved expeditiously are common".

Indeed, more recent research has postulated that the size of an enterprise (smaller enterprise) enables innovation to flourish free from bureaucratic constraints (Link and Bozeman, 1991). Similarly, Acs and Audretsch (1987)

provide empirical evidence that small firms have a relative innovative advantage over their larger counterparts in highly innovative industries. Further evidence for the comparative advantage of small firms in inventing radically new products is also given in Prusa and Schmitz (1991), and Rothwell (1983 and 1984).

From a review of recent scholarship, it is increasingly acknowledged that SMEs do make a significant contribution to innovation and/or that the nature and level of their contribution may be variable given:

(i) The industry sector (and the nature thereof). Acs and Audretsch (1987), reviewing the performance of US firms found that small firms have higher innovation rates in "high technology" skill-intensive industries and larger firms have the innovative edge in "lower technology," capital–intensive industries. In their subsequent research, investigating the relative innovation intensity amongst LSEs and SMEs in the manufacturing sector, Acs and Audretsch, (1988) and (1990) found that the innovation rate (calculated with reference to the number of personnel employed) was higher in SMEs than LSEs. Acs (1996) measuring innovation (defined as the total number of innovations per 1000 employees in different industry sectors) found that that small firms (<500 employees) produced more innovations in the fields of electronic computing equipment, process control instruments, electronic components, engineering and scientific instruments and plastics products. Subsequent research conducted by Acs and Audretsch (2001) investigating innovatory activity amongst small firms and across sectors found significant variations. For example, they found SMEs as making particularly significant contributions vis-à-vis innovation activity in a number of industries including computers and process control instruments as industries. Acs and Audretsch's findings complement and extend the work of Baldwin and Johnson (1999), who have observed the importance of small firms vis-à-vis electronics, instruments, medical equipment, steel, and biotechnology.

(ii) The country and its state of industrial development. Pavitt et al. (1987) and Rothwell, (1988) Acs and Preston (1997) contend that SMEs are responsible for a disproportionately large number of technological

innovations in industrialized nations (and in newly industrialized countries such as Korea (Lee, 1995) while in 'less' or 'least favoured regions', specifically developing countries larger (and exporting) firms have been revealed as the mainstay of innovation and typically the primary mechanism through which technologies are adapted from abroad to local circumstances (See Biggs, Shah, and Srivastava, 1996; Pack, 1992, and Pack and Westphal, 1986). Elsewhere, research undertaken by Harhoff and Licht (1996) indicated that fewer SMEs in the five new German Länder (previously East Germany) were innovative compared with West German counterparts (more than two-thirds of the smallest SMEs in East Germany were not considered innovative and were found to be less than half as likely to undertake R&D, as are their West German counterparts).

(iii) The economic or market structure. Acs and Audretsch (1987, 1988, and 1990) have also observed that market structure influences the total amount of innovative activity as does the relative innovative advantage between large and small enterprises.

(iv) Location (specifically proximity to universities and resultant 'knowledge spill-overs'). Acs *et al* (1994) in an econometric study and analysis of the pattern of innovations in the U.S. (in 1982) concluded that the innovative output of small firms was higher in the vicinity of universities. A study conducted by Audretsch and Vivarelli (1996), covering 15 Italian regions over nine years, arrived at the same conclusion.

Other research has sought to advance our understanding of the relative contribution of LSEs and SMEs as regards innovation by investigating (a) the nature and relative levels of patenting activity amongst LSEs and SMEs (e.g. Scherer, 1983; Bound et al., 1984; and/or (b) relative levels of expenditure by LSEs and SMEs on research and development; and/or (c) innovatory activities as reported by SMEs and LSE.

As regards (a), LSEs in the US have been found to the most innovatory economic form/unit of production (Acs and Audretsch (1990) found (analysing data for the US (SBA Innovation data) that the most innovative U.S. enterprises (those registering patents) were, in fact, LSEs - a finding explained as a

consequence of the fact that LSEs tended to have large R&D laboratories and be more naturally R&D resource intensive). Rothwell and Zegveld (1982) in a study of 380 innovations made between 1953 and 1973, in the U.S., UK, B.R.D., Japan, and France found that small firms contributed 31 % and large firms 54 % of all innovations. In estimating how radical the innovations were they also concluded that the entire output of small firms in UK consisted of radical breakthroughs. (The U.S. small firms produced 27 % of the "radical breakthroughs" made in the country as well as 30 % of the "major technological shifts" and 37 % of the "improvement-type innovations").

In West Germany SMEs have evidently demonstrated a higher propensity to patent than LSEs (Schwalbach and Zimmermann (1991)) and elsewhere research undertaken by Gellman (1976 and 1982) indicated that SMEs were contributing 2.45 times more innovations per employee than large firms while Acs and Audretsch (1990) found that small firms introduce 2.38 more innovations per employee than their larger counterparts.

It must be noted, however, that research based on patents as a measure of innovatory activity, should be treated with caution. As noted by Scherer (1983), "The quantity and quality of industry patenting may depend upon chance, how readily a technology lends itself to patent protection, and business decision-makers' varying perceptions of how much advantage they will derive from patent rights. Not much of a systematic nature is known about these phenomena, which can be characterized as differences in the propensity to patent". Furthermore, as observed by Mansfield (1984), "The value and cost of individual patents vary enormously within and across industries... Many inventions are not patented. And in some industries, like electronics, there is considerable speculation that the patent system is being bypassed to a greater extent than in the past. Some types of technologies are more likely to be patented than others". In addition, most SMEs producing innovations (as observed in the course of the surveys and interviews undertaken in the course of this research) do not necessarily avail themselves of patent or other formal protections but consider themselves no less innovative or less concerned with innovatory outputs.

Results from research comparing propensity to innovate based on patent data may, however, be skewed by the selection of industries or technologies sampled. For example, in specific studies of the semiconductor industry and patent data between 1977-89, Almeida and Kogut (1997) and Almeida (1999) argue that small firms tend to innovate in relatively unexplored fields of technology while larger enterprises seem to concentrate their research, measured as patents, in more established fields. Indeed, as observed by Jovanovic (2001) "The new economy is one in which technologies and products become obsolete at a much faster rate than a few decades ago" and so the propensity to patent may also be reduced as the state of the art is much more fluid. In addition, it should also be remembered that patents, of themselves, may contribute little to the knowledge stock or economics of a locality, region or nation if they are not commercially exploited or are exploited but elsewhere.

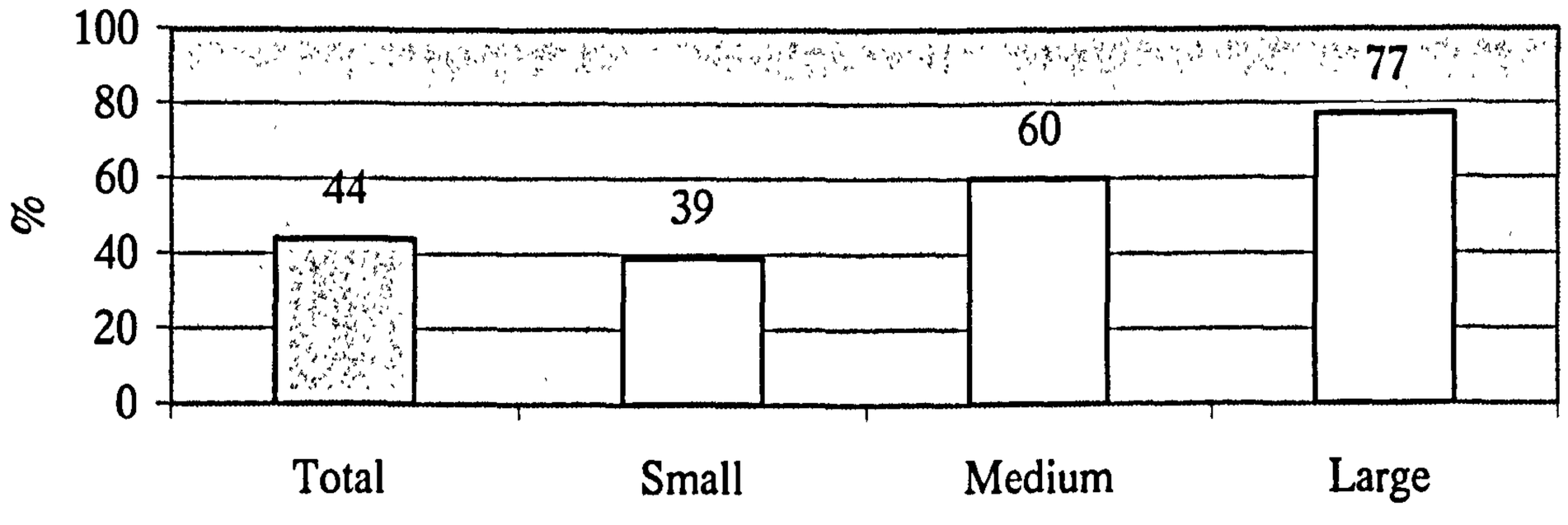
As regards (b), Harhoff and Licht (1996) determined that SMEs (defined in their study as having fewer than 500 employees) accounted for only 12% of the research and development expenditures in (West) Germany. However, again expenditure on R&D as an indicator of innovatory activity should also be treated with caution as this is in fact only a measure of activity (specifically, factor inputs and not outputs), and as such may not be particularly illuminating or evidential as a measure of the innovativeness and impact of innovations.

Furthermore, while LSEs may report higher levels of expenditure on R&D this may in fact be explained as a consequence of the fact that they are more able to disaggregate support or identify such costs with reference to e.g. dedicated R&D personnel whereas as noted in the course of this research relatively few SMEs reported that they had a dedicated R&D budget or could differentiate between expenditure on R&D from general expenditure which might therefore distort research results predicated on this indicator. Indeed, many of the SMEs interviewed in the course of this research indicated that they considered themselves innovatory or regarded themselves as innovating in product, process or administrative terms but did so without formal arrangements or measures (to disaggregate expenditure or staff time dedicated to R&D or innovation) a point also observed by Santarelli and Sterlachinni (1990 and 1994). Interestingly,

Harhoff and Licht (above) did observe that only 3% of the largest corporations in Germany that did not undertake formal R&D were considered innovative while, 25% enterprises with fewer than 50 employees without formal R&D could be considered innovative.

As regards (c), Harhoff and Licht's observation that the propensity to innovate seemingly decreases as the size of the enterprise decrease, these results were later echoed in the European Commission's Community Innovation Survey 'Innovation in Europe Results for the EU, Iceland and Norway' (2004) which also found that the propensity to innovate generally increases with the average size of an enterprise:

Figure 2.8: Proportion of EU enterprise with Innovatory Activity (1998-2000)

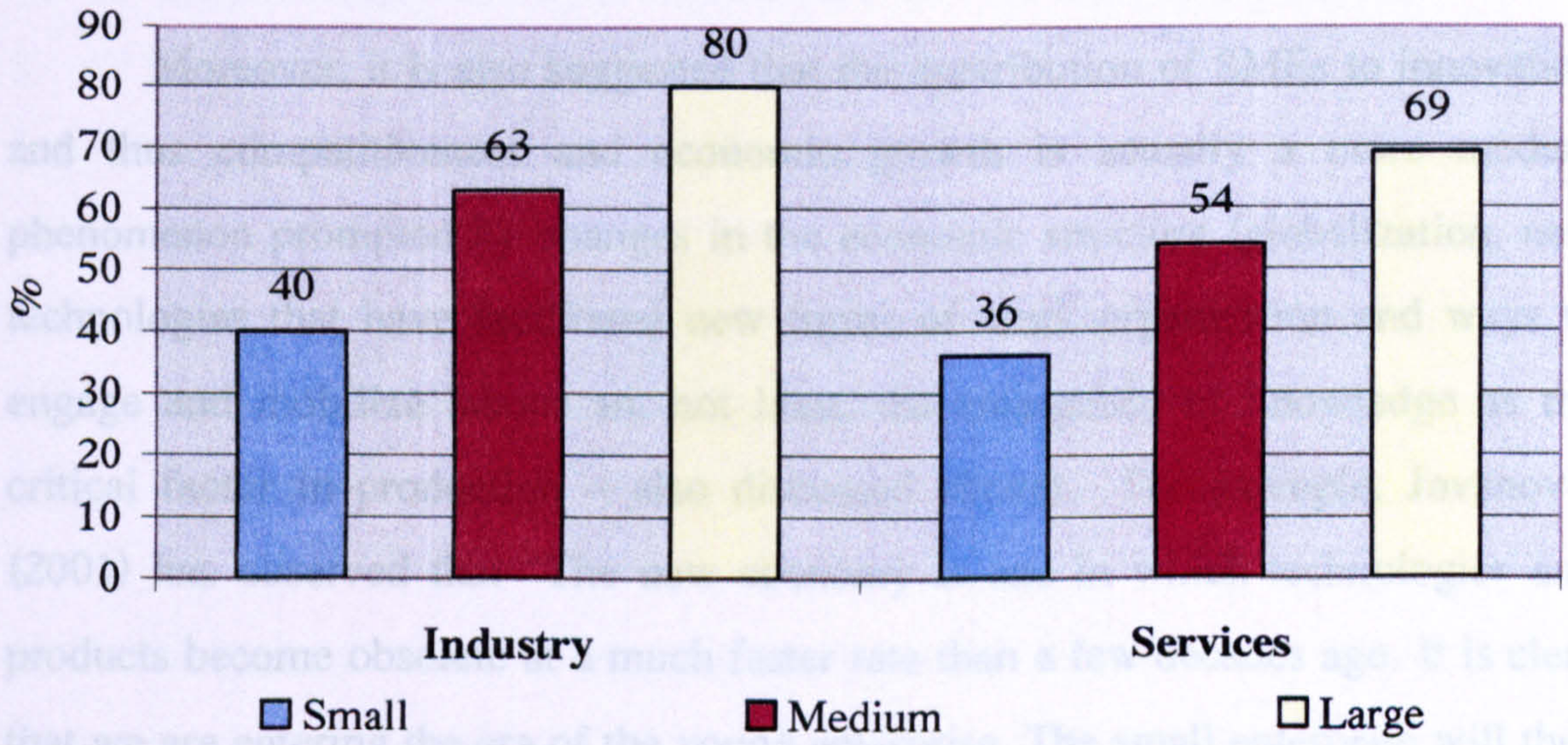


Source Data: European Commission's Community Innovation Survey (CIS), 2004

The CIS data illustrates that a higher proportion of large or medium-sized enterprises reported innovative activities than small firms during the period 1998-2000. Similarly, Harhoff and Licht's (1996) data (extracted from the Mannheim Innovation Data Base measuring the extent of innovative activity in German enterprises between 1990 and 1992) also indicated that propensity to innovate seemingly decreased as the size of the enterprise decreased i.e. 52% of enterprises with fewer than 50 employees were not innovative while only 15% of the enterprises with at least 1 000 employees were not innovative.

The EU survey also noted that there were proportionally more enterprises in the EU with innovation activity in industry than in services for each of the size-classes (illustrated overleaf) and that the 'gap' between these two sectors increased as a function of the size-class. Evidently, while the proportion of enterprises with innovation activity among small enterprises in the industrial sector and the services sector was relatively similar (40% and 36%, respectively), the degree of difference increased from 4% to 9% among medium-sized enterprises and to 11% among large enterprises.

Figure 2.9: Proportion of EU Enterprises reporting innovative activity by sector (1998-2000)



Source Data: European Commission's Community Innovation Survey, 2004

Evidently, however, a significant proportion of the enterprise stock LSE and, more particularly SME are innovating in a myriad of technologies and sectors although Pack and Westphal, 1986) and Pagano and Schivardi (2001) have observed, analysing a sample of European industrial sectors, that a larger average firm size is associated with faster innovation rates, while Acs and Audretsch (1987), examining innovation in the US have suggested that small firms tend to have higher innovation rates in "high technology" skill-intensive industries and larger firms have the innovative edge in "lower technology," capital –intensive industries.

In summary, relative innovation intensities notwithstanding, it is now generally accepted, as observed by the OECD, that "SMEs are a heterogeneous population of firms whose contributions to the innovation system are wide ranging and include not only R&D based new products and services, but also improved designs and processes and the adoption of new technologies". It is postulated that the contribution of entrepreneurial small firms to innovation and technological change has not been particularly well understood as traditional measures of innovatory activity have been inherently inadequate or ill-suited to the (e.g. patent or BERD discussed above) and that historically SMEs have been contributing to the innovation stock and the competitiveness of international, national, regional and local economies howsoever unobserved by policy makers and academics.

Moreover, it is also suggested that the contribution of SMEs to innovation and thus competitiveness and economic growth is actually a more modern phenomenon prompted by changes in the economic structure (globalization, new technologies that have facilitated new forms of work organisation and ways to engage and mobilize labour an, not least, the emergence of knowledge as the critical factor in production – also discussed above). For example, Jovanovic (2001) has observed that "The new economy is one in which technologies and products become obsolete at a much faster rate than a few decades ago. It is clear that we are entering the era of the young enterprise. The small enterprise will thus resume a role that, in its importance, is greater than it has been at any time in the last seventy years or so". In fact, there is a probably a grain of truth in both hypotheses and that the answer lies somewhere between the two.

The increased recognition and interest in the nature and level of innovation as occurring within SMEs has also prompted interest in the relative economic or commercial value of innovatory activity as occurring in SMEs and a range of work investigating the specific contribution of 'innovatory' SMEs to the creation of employment (itself an indicator of economic value). While the former is seemingly beset with methodological difficulties it is generally accepted, as regards the latter, that innovation has a positive effect on employment creation, an effect it is suggested, that may be more pronounced in small and medium sized enterprises than in large scale enterprises, and more so in the manufacturing as

well as the service sectors (see for example, Cesaratto et al., 1996; Kleinknecht et al., 1990; Klomp and Pronk, 1998). Generally, the analysis of employment creation by small innovative enterprises points to four key findings summarised in Tether (2000, p. 110):

1. Innovative or technology based new and small firms are more likely to create employment than similar firms in the general population.
2. The average rate of employment creation in an individual innovative or technology based new or small firm tends to be modest. In general the average rate of employment creation amongst such firms is much less than ten jobs per firm per year (Storey and Tether (1998)). This is not a recurrent finding for the UK, but also for continental Europe.
3. Growth amongst innovative and technology based new and small firms tends to be concentrated in a few firms (Storey et al., 1987; and North et al. 1994).
4. Even amongst the fastest growing innovative and technology based new and small firms the absolute number of jobs created over a decade tends to be modest.

In general terms, it is evident from the literature that innovation at aggregate as well as at firm level is said to have a positive effect on employment. As noted in European Commission, DG Enterprise's Report 'Innovative Small and Medium Sized Enterprises and the Creation of Employment' (2001), "there seems to be a consistently negative relationship between firm size and the rate of employment creation in innovative enterprises. However, although the average growth rate of employment appears to be higher in SMEs than in large scale enterprises, growth in innovative small firms is very variable with some small innovative enterprises showing very high and others very low growth rates. This underlines the higher risk small innovative enterprises face and may result in a comparatively low number of jobs created in these firms".

Additionally, a range of work has also been undertaken that has endeavoured to explore whether the nature and or the level of innovation produces different effects on employment. Specifically, as regards the different effects of product and process innovation on employment creation Lettmayr et. al (1997), for example, found that in Austrian SMEs reporting product and process innovation posted the highest increase in turnover followed by enterprises with only product innovation.

Notably, enterprises reporting only process innovations seemingly performed worse than non-innovative enterprises with regard to turnover growth. Further, with regard to employment growth only those SMEs that reported, product as well as process innovation posted a notable increase, results seeming confirmed by the EU's Second Community Innovation Survey (CIS II) and in the work of Ludsteck and Steiner (2000) who, in an analysis of the European manufacturing sector, found that innovation has a significant effect on employment only if product as well as process innovation is conducted jointly. As regards studies as to the impact of organisational innovations, (e.g. Coriat, 1995) it is postulated that they too may be an important source for increased productivity and competitiveness and that they may well have a major impact on the creation of employment, productivity and growth.

SME contributions to innovation and/or R&D (howsoever measured and reported) have attracted interest by policy makers who have (worldwide) programmed initiatives and instruments to support SME innovators via, for example:

- Business Incubators/Innovation Centres and other business services; and
- R&D grants (e.g. in Europe via the European Commission's Framework Programmes (now in their sixth incarnation) while in the US as reported by the US SBA, the US Departments of Agriculture; Commerce; Defence; Education; Energy; Health and Human Services; Transportation; the Environmental Protection Agency; the National Aeronautics and Space Administration and the National Science Foundation are required by Small

Business Innovation Research Program (SBIR) to reserve a portion of their R&D funds for award to small business and similarly the Small Business Technology Transfer Program (STTR) again requires the Departments of Defence; Energy; Health and Human Services; the National Aeronautics and Space Administration and the National Science Foundation to reserve a portion of their R&D funds for award to small business

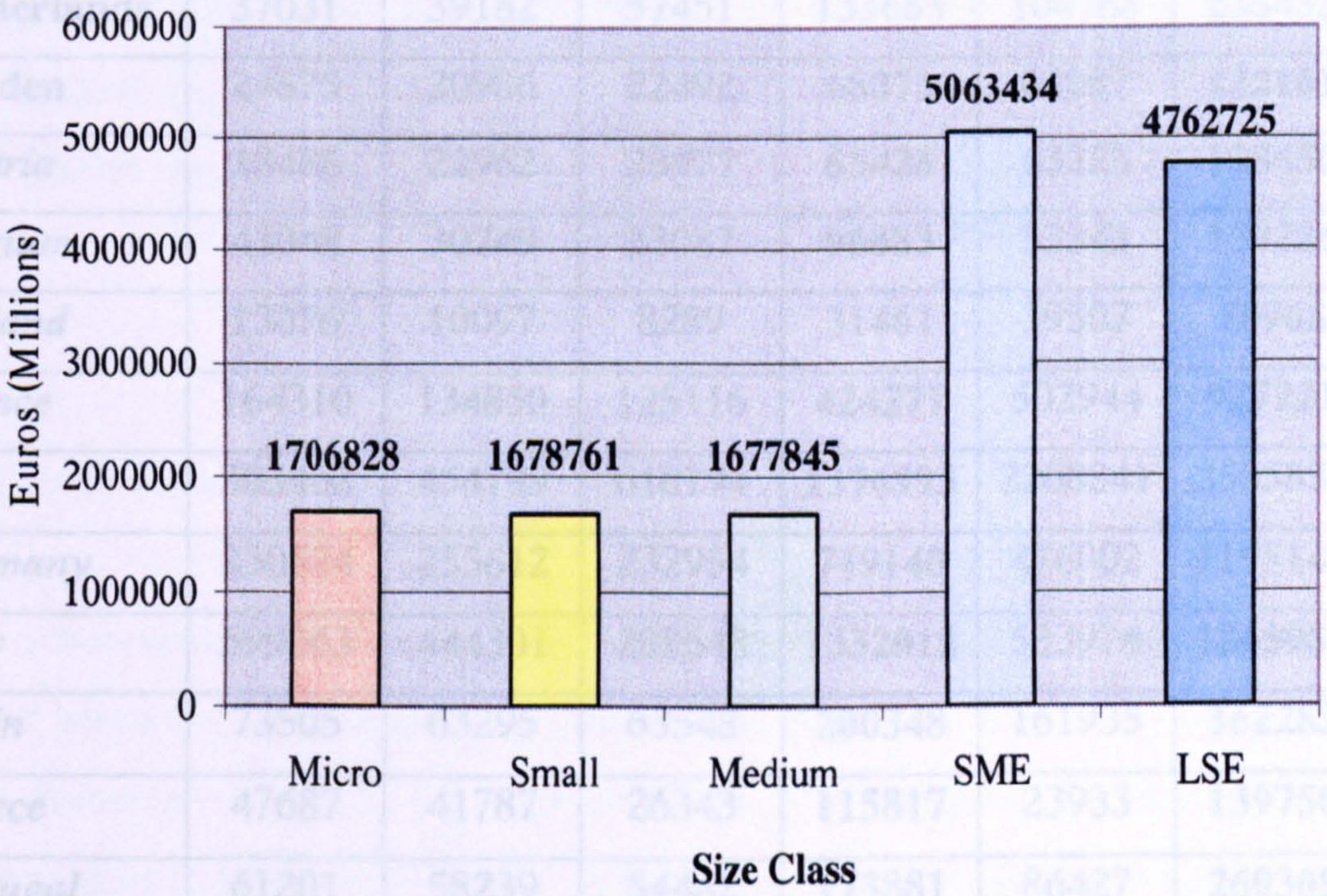
Notwithstanding the level and array of support devoted to supporting SME innovators, the economic value of innovations is difficult to quantify empirically. For example, there are difficulties in disaggregating the economic performance of an enterprise and attributing parts thereof to a product(s), process (es) or indeed administrative innovation(s) to say nothing of adequately acknowledging the contribution of other factors. Indeed, Gold (1976) postulates that argued that the objective of determining the economic effects of innovation is generally unattainable.

Therefore and in concluding this review of the contribution of SMEs to regional economic performance and specifically in 'less favoured' regions a review of GVA (the difference between the value of goods and services produced and the cost of raw materials and other inputs which are used up in production) data by country and size class across Europe is thus perhaps more informative as perhaps it is the degree and extent to which SMEs create and add economic value that is perhaps more descriptive and revealing in economic terms (especially given the inherent difficulties in quantifying the contribution of SME innovations to economic performance). Indeed, it is perhaps the truest measure of entrepreneurship i.e. the capacity to manipulate factor inputs (whatever they may be) and add value for a commercial return.

2.12 SMEs and GVA

Evidently, not only do SMEs account for a significant proportion of GVA as generated in the EU (illustrated below) to which micro, small and medium sized enterprises play a part, in fact their collective contribution to total GVA exceeds that of LSEs. This latter finding is perhaps not surprising given the demographics of the EU's economic structure and the preponderance of SMEs therein.

Figure 2.10: Total EU GVA (2000) by size class



Source Data: European Commission Observatory of European SMEs, 2001[20]

Furthermore, as is evident from the data (set out in the table below) the 'less-favoured regions' (italics) of the EU account for 88.4% of total EU GVA. Furthermore, the SME stock of the EU's less favoured regions accounts for 46.16% of the total while their LSE stock accounts for 42.24%.

[20] Source Data derived from Eurostat's SME Database for 1993/1997, as updated by EIM Business & Policy Research retrieved on 12.04.05 from European Commission Observatory of European SMEs (Statistics)' from website: http://www.eim.nl/observatory_7_and_8/en/stats/2001/var3/1cou_size.html (12.04.05

Table 2.8: Value added by country and size class (million Euros), 2000[21]

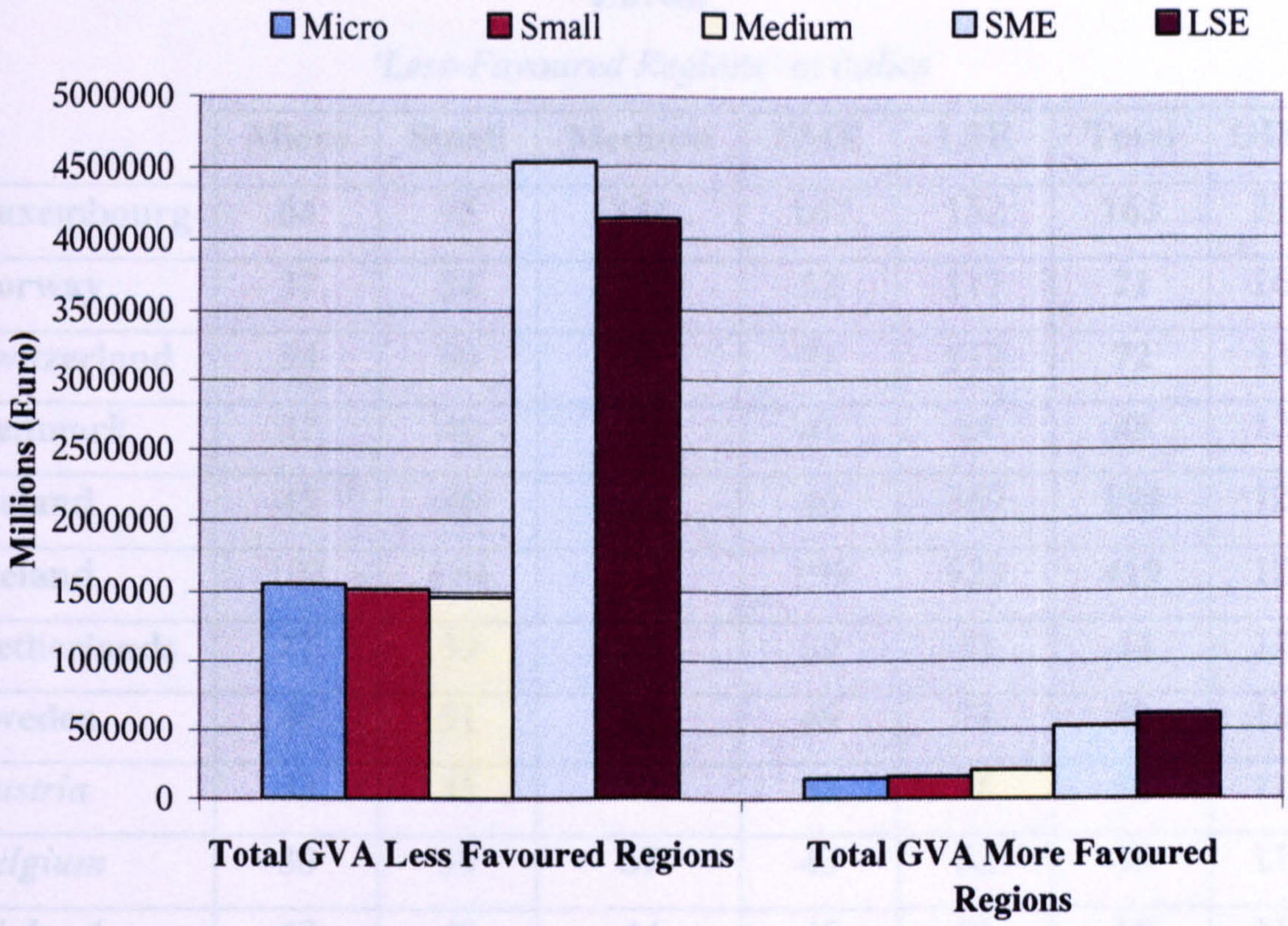
'Less-Favoured Regions' in italics

	Micro	Small	Medium	SME	LSE	Total	GDP
Luxembourg	3110	4707	17231	**25048**	8712	**33760**	219
Norway	13059	12485	15215	**40759**	37651	**78410**	162
Switzerland	32224	28568	28376	**89168**	96884	**186052**	135
Denmark	16729	14678	13639	**45046**	31624	**76670**	127
Iceland	1340	994	511	**2845**	20221	**23067**	126
Ireland	24308	40550	57732	**122590**	248647	**371236**	126
Netherlands	37031	39182	57451	**133665**	104768	**238433**	122
Sweden	24675	20906	22492	**68073**	64087	**132161**	120
Austria	18486	22962	23977	**65426**	63225	**128650**	117
Belgium	43048	30749	23087	**96883**	53343	**150226**	117
Finland	13076	10097	8289	**31461**	39507	**70968**	114
France	164310	134850	125116	**424277**	502944	**927221**	114
UK	303402	454799	618794	**1376995**	2208841	**3585836**	114
Germany	230574	255612	232954	**719140**	476002	**1195142**	112
Italy	599063	444301	288648	**1332012**	533974	**1865986**	111
Spain	73505	63295	63548	**200348**	161935	**362283**	92
Greece	47687	41787	26343	**115817**	23933	**139750**	72
Portugal	61201	58239	54442	**173881**	86427	**260308**	46
Total	1706828	1678761	1677845	**5063434**	4762725	**9826159**	

In addition, as illustrated below, the average GVA per enterprise in 'less favoured regions' greatly exceeds that of their counterparts in 'more favoured' regions:

[21] Source Data: 'European Commission Observatory of European SMEs (Statistics)' retrieved on 29.11.04 from website: http://www.eim.nl/observatory_7_and_8/en/stats/2001/var4/4e19.html

Figure 2.11: Total EU GVA (2000) by size class and 'Region'



Source Data: European Commission Observatory of European SMEs, 2001

Interestingly, while the collective GVA of 'less favoured' regions exceeds that of 'more favoured' regions (a factor of the volume of EU enterprise located in 'less favoured regions'), the average GVA per enterprise in 'more favoured regions' does in fact exceed that of 'less favoured' regions (see table below).

Table 2.9: Value added/enterprise by country and size class – 2000 (1000 Euros)

'Less-Favoured Regions' in italics

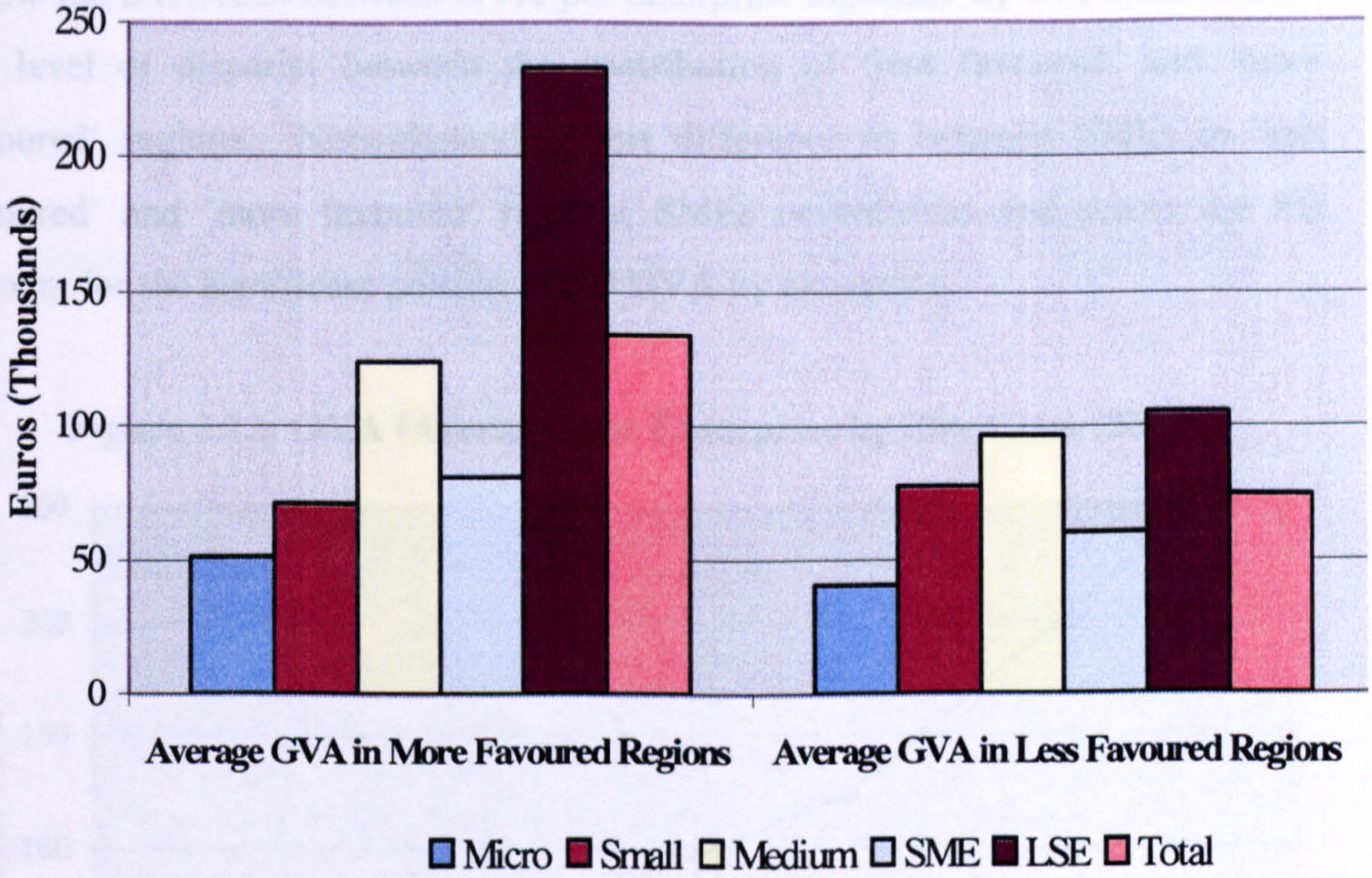
	Micro	Small	Medium	SME	LSE	Total	GDP
Luxembourg	64	95	332	167	152	**163**	219
Norway	37	54	78	52	117	**71**	162
Switzerland	54	50	50	51	112	**72**	135
Denmark	37	40	49	41	64	**48**	127
Iceland	45	46	51	46	369	**198**	126
Ireland	108	194	316	199	923	**419**	126
Netherlands	27	39	55	39	51	**44**	122
Sweden	40	51	63	49	74	**59**	120
Austria	33	45	52	43	78	**55**	117
Belgium	30	59	67	43	52	**45**	117
Finland	42	49	44	45	81	**60**	114
France	28	41	51	36	87	**53**	114
UK	49	150	247	117	232	**168**	114
Germany	27	42	70	40	40	**40**	112
Italy	87	147	183	116	189	**130**	111
Spain	12	25	39	20	62	**28**	92
Greece	46	133	113	73	98	**76**	72
Portugal	52	81	96	70	131	**83**	46

Source Data: European Commission Observatory of European SMEs, 2001[22]

As may be observed from the data above and chart below, the difference between the average value of goods and services produced and the cost of raw materials and other inputs which are used up in production is greater in 'more favoured' regions and 'less favoured' is higher in 'more-favoured' regions for each size class of enterprise other than 'Small' (illustrated below).

[22] Source Data: 'European Commission Observatory of European SMEs (Statistics)' retrieved on 30.11.04 from website: http://www.eim.nl/observatory_7_and_8/en/stats/2001/var6/1cou_size.html

Figure 2.12: Average GVA per EU Enterprise (2000)



Source Data: European Commission Observatory of European SMEs, 2001

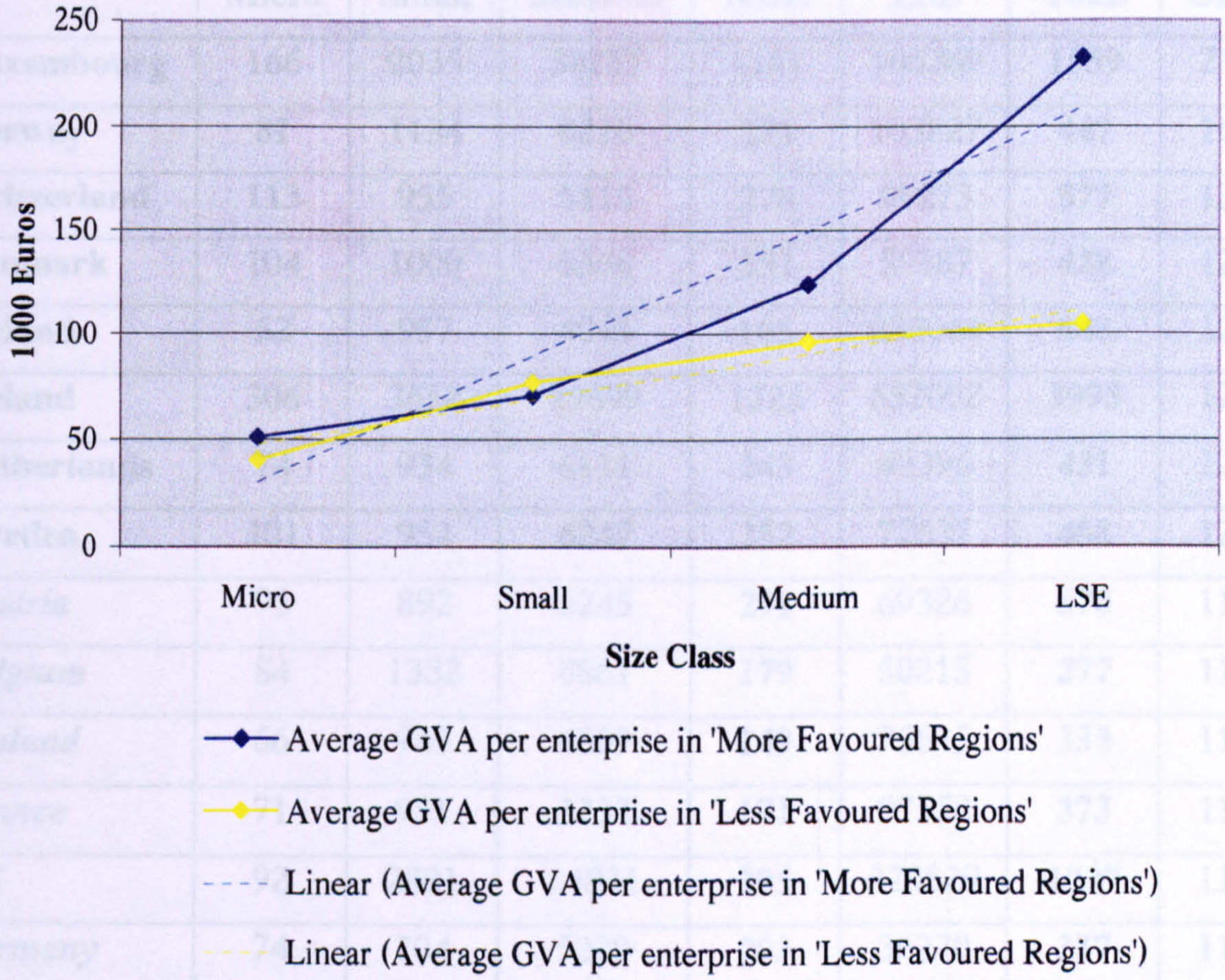
Table 2.10: Value added/enterprise by country and size class (2000) (1000 Euros) by 'Region'

	Micro	Small	Medium	SME	LSE	Total
Average GVA per enterprise in 'More Favoured Regions'	51.5	71.13	124.25	80.5	232.75	134.25
Average GVA per enterprise in 'Less Favoured Regions'	40.6	77.2	96.2	60.3	105	73.8

Source Data: European Commission Observatory of European SMEs, 2001

Furthermore, as may also be observed from the trend lines in the chart below the difference between GVA per enterprise increases by size class as does the level of disparity between the contribution of 'less favoured' and 'more favoured' regions. Notwithstanding this difference as between SMEs in 'less favoured' and 'more favoured' regions, SMEs nevertheless and across the EU account for the significant portion of EU GVA by enterprise.

Figure 2.13: GVA (Average) per Enterprise by Size Class (2000)



Source Data: European Commission Observatory of European SMEs, 2001

As regards Value added/employment in enterprises (by size class) and across the EU (less favoured and more favoured regions) there are again significant variations vis-à-vis the contribution by size of firm and by country and by region (less/more favoured).

Table 2.11: Value added/employment by country and size class – 2000 (1000 Euros) by region

'Less-Favoured Regions' in italics

	Micro	Small	Medium	SME	LSE	Total	GDP
Luxembourg	166	2035	34257	**1161**	106369	**1559**	219
Norway	81	1134	8220	**233**	103827	**447**	162
Switzerland	113	955	5116	**278**	99273	**577**	135
Denmark	104	1000	5368	**252**	59187	**428**	127
Iceland	52	957	4013	**105**	230064	**848**	126
Ireland	306	3652	29699	**1325**	652002	**3995**	126
Netherlands	74	934	6111	**243**	43396	**431**	122
Sweden	101	954	6247	**252**	72537	**488**	120
Austria	95	892	5245	**291**	69326	**570**	117
Belgium	84	1332	6861	**179**	50215	**277**	117
Finland	66	945	4509	**149**	75635	**335**	114
France	71	951	5233	**171**	97558	**373**	114
UK	92	2881	24831	**395**	320529	**1027**	114
Germany	74	704	5229	**203**	36270	**337**	112
Italy	152	2648	18110	**323**	203873	**452**	111
Spain	29	511	3937	**74**	54785	**134**	92
Greece	61	2524	11175	**145**	64047	**175**	72
Portugal	96	1549	9186	**255**	99843	**381**	46
Total	1817	23677	193347	**6034**	2438736	12834	

Source Data: European Commission Observatory of European SMEs, 2001[23]

[23] Source Data: 'European Commission Observatory of European SMEs (Statistics)' retrieved on 29.11.04 from website: http://www.eim.nl/observatory_7_and_8/en/stats/2001/var5/1cou_size.html

However, and most notably, as regards GVA/employment by size-class of enterprise, the average as calculated for 'More Favoured' and 'Less Favoured' regions is vastly superior in the former:

Table 2.12: Average GVA/employment (1000 Euros)

Regions	Micro	Small	Medium	SME	LSE	Total
'More Favoured'	124	1452	12378	**481**	170831	**1096**
'Less Favoured'	72	1050	8513	**193**	97223	**368**

Source Data: European Commission Observatory of European SMEs, 2001

2.13 Summary: The contribution of SMEs to regional economic performance

In policy terms, SMEs are now seemingly central to economic policy worldwide and, as explored above, are accorded a pivotal role in for example, Europe, the US and Asia in securing national competitiveness, embedding the entrepreneurial spirit, securing economic growth and mass employment. Furthermore, they are considered to be one of the principal driving forces in economic development and are said to form the backbone of the market economy for, as illustrated above, SMEs account for 99%+ the enterprise stock of EU Member States of which 93.1% are Micro firms (0-9 employees), 5.88% are Small Firms (10-49 employees) and 0.83% are Medium-sized firms (50-249 employees).

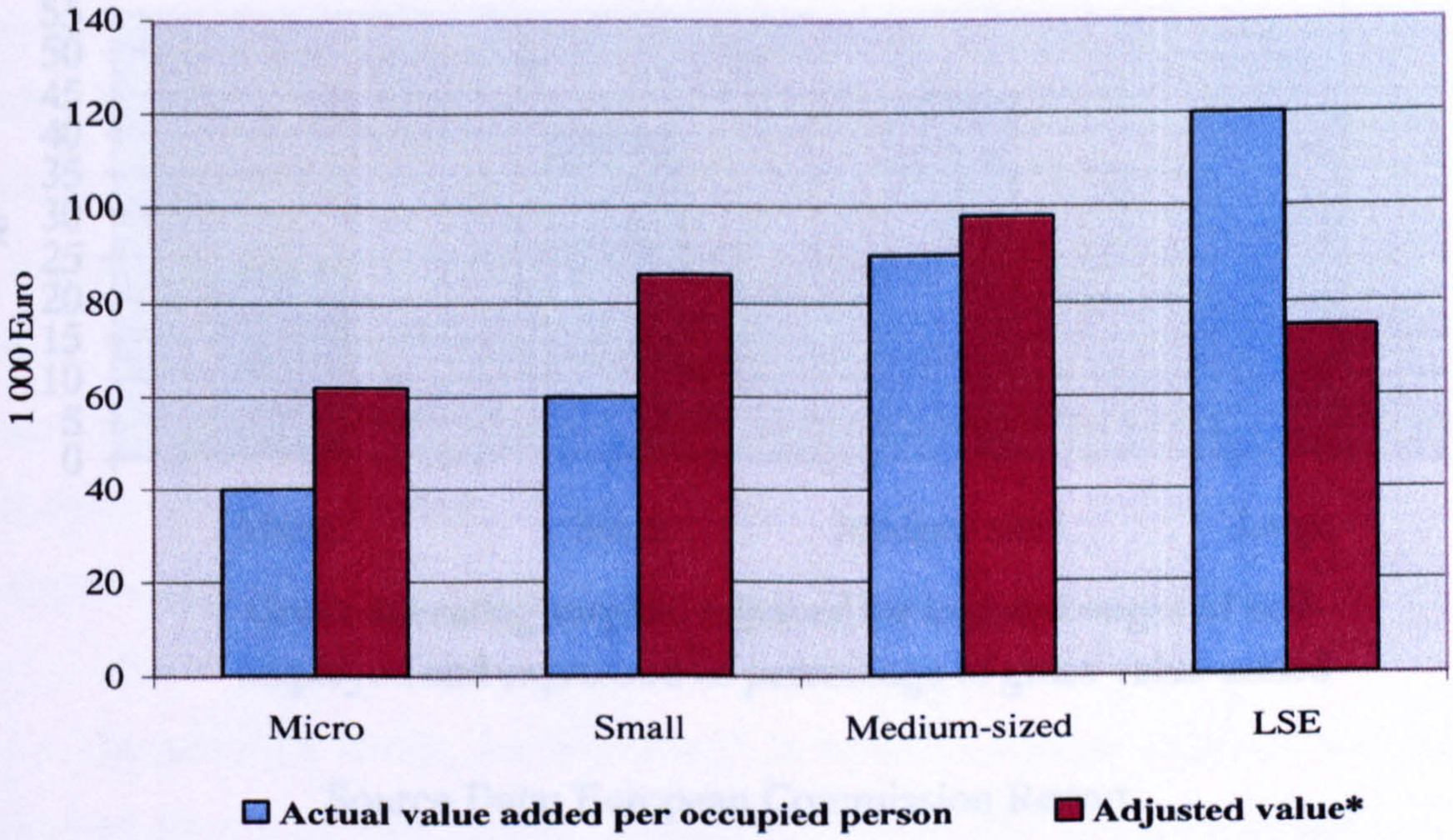
In 'less-favoured' regions of Europe SMEs account for 88.88% of the EU's total stock of Micro Firms, 88.87% of Small Firms, 84.21% of Medium Sized Firms and 87.5% of Europe's total stock of LSEs. From the data presented above, it may also be observed that 'less-favoured' regions in Europe have, on average, a notably higher proportion of Micro sized firms (93.19% of their total enterprise stock compared to 89.92% of more favoured regions). As regards, small enterprises, these represent 5.77% of the enterprise stock in less favoured regions as compared to 8.04% in regions with a GDP higher than the EU average, while

0.876% of their enterprise stock are medium sized firms compared to 1.81% in 'more favoured regions'.

Perhaps the most significant contribution to the socio-economic fabric is however the SME contribution to employment. However, as regards their contribution to employment in 'less-favoured' regions and 'more favoured regions', there is evidently significantly higher average proportion of total employment in Micro sized firms in 'less favoured' regions than 'more favoured' regions (37.41% as compared to 26.27%); lesser proportion of employment [average] in small firms in 'less favoured' as compared to 'more favoured' regions (18.92% as compared to 21.11%); lesser proportion of employment [average] in medium sized firms in 'less favoured' as compared to 'more favoured' (13.76% compared to 18.29%; and lower proportion of employment [average] in LSEs 'less favoured' as compared to 'more favoured' (29.91% as compared to 34.33%).

Notwithstanding, the industrial structure of 'less-favoured' and 'more-favoured' regions and debates as to the contribution of SMEs to job creation, specifically 'net job creation' and/or 'job destruction' a subject that seems to occupy scholars more so than policy makers, a competitive SME sector is heralded as key to sustainable development, innovation and productivity within and outwith 'less favoured' regions. Productivity amongst SMEs (and LSEs) is notably higher in 'more-favoured' regions that 'less-favoured' regions as measured by GVA. Furthermore, productivity increases by size class of enterprise which would appear to suggest that size still matters or rather confers competitive advantages. However as illustrated below, in the European Commission's 2003 SME Observatory Report, as regards 'Value Added as per occupied person' in Europe, while the actual value as per size class of enterprise increases with firm size and is ultimately higher in LSEs than SMEs (see above), the adjusted value added per employee (adjusted for differences in the economic structure) is higher in SMEs (in all size classes of SME except Micro-sized firms) than LSEs.

Figure 2.14: Value added per occupied person, Europe (19), 2003



* Assuming the same industry structure for all size-classes.

Source Data: European Commission's SME Observatory Report, 2003[24]

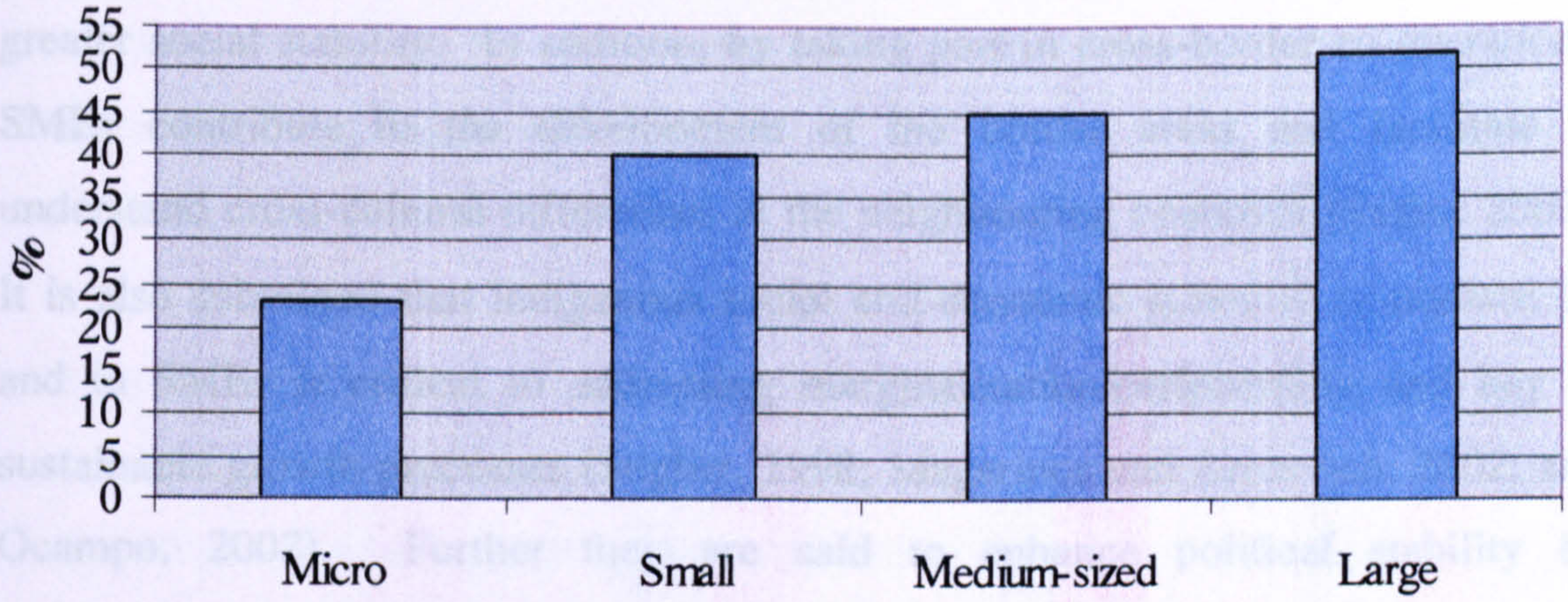
The EU Commission's SME Observatory Report also illustrates that while LSEs may have been the dominant economic unit and considered the optimum form of business organization and inherently more efficient and profitable and while this still may be the case, using a proxy measure of profitability (which is the gross operating surplus, and is defined as the difference between gross value added and labour costs and adjusted for imputed wage costs and expressed as a percentage of gross value-added) profitability ranges between 40-52 % in small, medium-sized and large enterprises, while for micro enterprises, it is significantly lower at almost 25%.

Furthermore, according to the EU Commission Report the difference between small, medium-sized and large enterprises all but disappears when adjusted for sectoral effects although micro enterprises consistently lag behind the other size-classes whether or not sectoral effects are taken into account.

---

[24] Source Data: European Commission Report Observatory of European SMEs 2003, No. 7 'SMEs in Europe 2003', page 27 citing EIM Business & Policy Research, estimates based on Eurostat's Structural Business Statistics and Eurostat's SME Database, also based on European Economy, Supplement A, May 2003, and OECD: Economic Outlook, No. 71, June 2003 (assuming the same industry structure by size class).

Figure 2.15: Profitability by size-class, Europe (19), 2003



Gross operating surplus, adjusted for imputed wages of self-employed and expressed as percentage of gross value-added

Source Data: European Commission Report
Observatory of European SMEs 2003[25]

In any event, notwithstanding debates as regards job creation and destruction, economic efficiency, profitability and innovativeness (and the various measures cited for the proposition that SMEs are significant), SMEs are lauded throughout 'less favoured' and 'more favoured' regions of Europe, the US and Asia, for their ability to provide employment, support economic growth and thus economic and political emancipation of minorities, contribute to the alleviation of poverty and assure more equitable distributions of wealth and democratic power throughout society and support economic growth (as explored variously by, for example, Jovanovic (1982, 2001); Ericson and Pakes (1995); Audretsch (1995); Hopenhayn (1992); Lambson (1991) and Klepper (1996) to mention but a few.

It is also clear that, in fostering conditions to support and enhance the SME contribution, economic developers and planners aim also to derive a range of other social benefits that are frequently attributed as products of a vibrant SME sector. For example, it is submitted that SMEs can be instrumental in countering regional disparities, providing opportunities for indigenous economic activity that reduce

---

[25] European Commission Report Observatory of European SMEs 2003, No. 7 'SMEs in Europe 2003', page 28 citing EIM Business & Policy Research, estimates based on Eurostat's Structural Business Statistics and Eurostat's SME Database, also based on European Economy, Supplement A, May 2003, and OECD: Economic Outlook, No. 71, June 2003.

pressures to migrate from rural to urban areas and thus ultimately contribute to greater social stability. In addition, by taking part in cross-border co-operations, SMEs contribute to the development of the border areas and facilitate to understand cross-cultural differences in the neighbouring countries (Szabo, 2003). It is also submitted that indigenous social and economic potential as realised by and in SMEs is critical to addressing marginalisation/peripherality and key to sustainable growth processes (Stiglitz, 1998; Magarinos and Sercovich, 2002; and Ocampo, 2002). Further they are said to enhance political stability by strengthening middle-class influence and distributing prosperity (Vosloo, 1994).

In addition, SMEs are considered to endow national, regional and local economic structures with resilient industrial systems. For example, Jacobs (1969) and M. Porter (1990) note that concentrations or intensities of enterprises in e.g. a particular sector or region endow that sector or region with competitive advantages (re competition for knowledge and new ideas) while Rothwell (1983 and 1984) emphasises that large and small firms complement and succeed each other in the innovation and diffusion process.

Further, SMEs are lauded for their flexibility and ability to adapt quickly to changing market demand and supply situations. Cohen and Levinthal (1989) suggest that small firms are particularly adept at developing the capacity to adapt new technology and ideas developed in other firms and are therefore able to appropriate some of the returns accruing to investments in new knowledge made externally, while Luetkenhorst (2004) and others explain that as compared to larger firms SMEs are more naturally flexible, enjoy a closer proximity to customers and a therefore more responsive to customer needs and are not encumbered by layers of management and bureaucracy (see also Scherer above) which enable them to make decisions more quickly.

It also generally asserted (and accepted by policy makers) that SMEs provide positive externalities to their surrounding (local or national) economy, complementing scale-intensive large firms, and that they make input factors available at higher quality or lower prices, or create innovations on which consumers or other producers in the value chain (upstream or downstream) may

build. Indeed, according to for example Audretsch (1995) and others (see above) small firms account for a disproportionate share of new product innovations, given their low R&D expenditures.

It is also asserted that the ability of SMEs to innovate and generate and diffuse knowledge within the enterprise stock is also crucial to economic competitiveness - see European Commission Competitiveness Report (2004) which contends that knowledge generated by SMEs is not only applied by the originating company but may also be adopted, adapted and applied by other businesses with minimal investment (cost is largely borne by the originator); thus supporting endogenous growth (see also Romer, 1986; Lucas, 1988 and 1993 and Grossman and Helpman, 1991). It is also postulated that within concentrations or intensities of enterprises, complementary inputs and services are likely to be more readily available within such an industrial structure than one dominated by large, vertically integrated producers.

Aside however from the social and economic value accorded SMEs in both the scholarly and policy literature, the evidence that supports many of these propositions is less than overwhelming and certainly not beyond contestation. Indeed, the current policy conviction may be as readily undermined as fortified by the literature. A concern to support the SME sector (notwithstanding dissent e.g. Postrel, 1994) nevertheless remains which while perhaps a product of economic growth and development theories might also be explained in part by a fusion of growth machine theory and the economic theory of bureaucracy and regeneration theory (see Figure 1). Moreover, the fact that the number of small businesses and self-employed people has increased significantly since the end of the Second World War, a concern to provide support measures for the SME sector and thus those employed therein may also rest as much on the fact that it represents a significant 'block' in the demographics of economic activity and in the social fabric and in electoral terms. It is perhaps more true to say that the current commitment to the SME sector and public support for the business incubator industry may stand on this basis as opposed to any compelling evidential foundation for the modality. This is explored in the remainder of this thesis.

Chapter 3: Public Support for Indigenous Businesses and Business Incubation

3.1 Introduction

The contribution of SMEs to social, economic, political development and democracy has been the subject of a wealth of academic and policy research. Despite the multiplicity of claims vis-à-vis their contribution to national competitiveness, innovation, and job creation the nature and level of these contributions is, arguably, still not particularly well understood or easily/satisfactorily verified empirically (see chapter 2). While the veracity of such claims is disputed and might reasonably be expected to have undermined the current policy consensus, research that questions the fundamental assumptions underlying public support is remains largely unlooked-for and a political and bureaucratic/technocratic policy concern to foster conditions conducive to SME development and support the business services sector particularly business incubation (as illustrated in Figure 1) continues to prevail the world over.

On the basis of desk research and unstructured interviews with incubator managers and stakeholders at for example, North East Business and Innovation Centre (Sunderland), Entrust (Newcastle), ATMEL/Cenamps (Newcastle), The Digital Factory (Newton Aycliffe), Loughborough Innovation Centre, DeMontfort Innovation Centre, UNIEI (Nottingham) BioCity (Nottingham), The Hive (Nottingham), Mansfield I-Centre, Midlands Innovation Relay Centre (Coventry), this chapter provides a brief overview of some of the chief instruments of industrial policy and business support measures (in Europe) designed to support indigenous businesses, before exploring the development of business incubation (including definitions and models thereof) and the deployment of business incubators in Europe.

3.2 Support for indigenous SMEs

SMEs have recently emerged as a central policy concern not only within the European Union, the US, Japan at al but also European countries in transition moving from centrally planned to market economies. In the EU, the European

Community's legal basis for reinforcing the business services sector was established in 1989 with the introduction of regional policy measures to assist local or endogenous development. Since that time, a number of policy documents adopted by the Commission have given a strong impetus to this type of measure. The White Paper on Competitiveness, Growth and Employment (1994) recognised that business services were "one of the key components" of SME competitiveness and emphasised that "non-physical (i.e. knowledge-based) investment" must in future be accorded at least the same priority as physical investment.

Subsequently, the Green Paper on Innovation (1995) emphasised the organisational factors which were essential in order to facilitate SME access to innovation services (and it designates BICs as one the instruments capable of fulfilling this role – see below and case studies). Further, in 1999, the European Commission Communication on the competitiveness of European enterprises in the face of globalisation stressed the importance of non-physical services to businesses.

In Europe and outwith the EU a raft of policy instruments and legislation, as reported by UNECE (2003), has emerged in the last five years:

- Albania: (Law on SMEs, 2002);
- Bulgaria (National Economic Development Plan for 2000-2006; Law on Small and Medium-sized Enterprises, adopted in September 1999 and National Strategy on the Development of Small and Medium-sized Enterprises in Bulgaria for the period 2002-2006);
- Czech Republic (Industrial Policy of the Czech Republic – 2000, Act No47/2002 on Support of Small and Medium-sized Activities);
- Hungary (Law on SMEs – 1999);
- Poland (Government Program on Capital for Entrepreneurs, September 2002);
- Romania (Law No 133/1999 on "Stimulation of Private Entrepreneurs for the Establishment and the Development of Small and Medium Sized

Enterprises with subsequent Amendments and Government Decision No. 1211/2001 on "Establishing the National Credit Guarantee Fund for SMEs and Measures for Simulating, the Starting up and Developing SMEs", 2002);

- Slovakia (The Government Resolution No 779/2000 of 27 September 2000 on "Government Ratification of the State Support Programmes for the period of 2000 – 2005");

A concern for SMEs has also exercised legislators in the former USSR where comparable policy measures and legislation to support SMEs has been enacted in recent years in:

- Armenia (State Support of SME, December 2000);
- Azerbaijan (Law on State Support for Small Entrepreneurship, June 1999);
- Estonia (Enterprising Estonia. National Policy for the Development of Small- and Medium-sized Enterprises in Estonia in 2001-2006);
- Georgia (Law on Small and Medium Enterprise Support, 1999);
- Kazakhstan (Government Resolution on "Measures of Support of Women Entrepreneurship, June 2000);
- Kyrgyzstan (Presidential Decree on "Measures on Improvement of Conditions for Development of Business in the Kyrgyz Republic, September 2001 and Government Resolution on "Ratification of the State Program on Entrepreneurship Development in Kyrgyz Republic in 2001-2003, August 2001);
- Latvia (Guideline for the Industrial Development in Latvia – 2001 and National Programme for the Development of SMEs 1997-2001);
- Lithuania (New SME strategy – September 2000),
- Uzbekistan (Law on Guarantees for the Freedom of Entrepreneurial Activities, May 2002).

Similarly, the dissolution of Yugoslavia has been followed by comparable initiatives in:

- Croatia (Law on Small Business Development Encouragement, prepared by Ministry for Crafts and SMEs, accepted in 2002);
- Macedonia (National SME Strategy, 2002);

Historically, as rehearsed below, industrial policy has, since the end of the Second World War and until relatively recently, been concerned with the promotion of particular industries and larger enterprises therein. However, changes in the industrial structure (again, the world over) in the last 30 years (as rehearsed in the previous chapter) and thus the competitive advantage of nations (prompted by the development of economic capability and capacity across the globe and the consequent globalisation of trade), economic restructuring and the erosion of the large company as the dominant economic form has been paralleled by the rise (or rather the return) of the SME and an appreciation of the contribution of this 'economic unit' (and their potentialities) to supranational, national, regional and local economic performance.

This chapter proceeds to provide a brief overview of support for indigenous businesses (industrial policy) and the emergence of business incubation in Europe and its application in 'less-favoured regions' thereof. The chapter then proceeds to consider the range of business support measures supporting SME development in Europe and specifically business incubation.

From a review of the literature (policy and scholarship), it is evident that national and regional industrial policies (in the US, Western Europe (including 'less favoured' regions) and Asia may be said to have been largely concerned (until relatively recently) with the promotion of successful (large) businesses, specific sectors (e.g. manufacturing, agriculture and such other industries which figure prominently in international trade between nations) characterised by large vertically integrated OEMs and more recently emergent technologies (again at the behest of large multinational corporations who have tended to lead R&TD in such areas). There is little to suggest that SMEs have figured as a pre-eminent concern

in national, regional or indeed supranational industrial policies anywhere in the world until relatively recently. Indeed, as noted by the Government of South Africa (undated) "Monetary, foreign-exchange and industrial strategies were formulated to support the specialisation of larger firms in capital-intensive production, feeding the higher end of the market, and small-scale producers were left to produce inferior goods, commonly catering for the lower end of the market, and using labour-intensive means of production".

Some of the most notable or main instruments of industrial policy may be generally said to have included:

- Protectionist measures (tariffs and artificial barriers including regulatory policies);
- Promotion of Mergers and Acquisitions;
- Subsidies for indigenous enterprises and subsidies to attract FDI;
- Systems of national, regional and local grant aid; and
- The development of business support services and latterly 'business incubation'.

3.3 Protectionist measures

Policy support for indigenous industry has a long history and one which arguably began with protectionism. Alexander Hamilton, in his 'Report on Manufactures' communicated to the House of Representatives on December 5, advocated support and aid as critical for indigenous infant industries as long ago as 1791. He wrote "The superiority antecedently enjoyed by nations who have preoccupied and perfected a branch of industry, constitutes a more formidable obstacle...to the introduction of the same branch into a country in which it did not before exist. To maintain, between the recent establishments of one country, and the long-matured establishments of another country, a competition upon equal terms, both as to quality and price, is, in most cases, impracticable. The disparity ...must necessarily be so considerable, as to forbid a successful rival ship, without the extraordinary aid and protection of government".

One of, if not the most significant, instruments developed and deployed across the globe to support indigenous industry have been protectionist measures (i.e. tariffs on imported goods) and regulations designed to inhibit imports that compete with indigenous product/producers which, as instruments of industrial policy, have been variously lauded or disparaged. Writing on tariffs in the 19th century, economist Taussig (1931) nevertheless concluded that they did little or nothing to promote domestic industry: "Little, if anything, was gained by the protection which the United States maintained...The intrinsic soundness of the argument for protection to young industries therefore may not be touched by the conclusions drawn from the history of its trial in the United States, which shows only that the intentional protection of the tariffs of 1816, 1824, and 1828 had little effect".

Taussig's analysis might be contrasted with work elsewhere within and outwith the US. In Britain, for example, Kitson and Solomou (1990) have postulated that the General Tariff of 1932 provided a substantial stimulus to the domestic economy in the 1930s, making domestic products more competitive, encouraging import substitution and macroeconomic expansion while Buchanan (1998) writing on the history of U.S. protectionism has submitted that "Behind a tariff wall built by Washington, Hamilton, Clay, Lincoln, and the Republican presidents who followed, the United States had gone from an agrarian coastal republic to become the greatest industrial power the world had ever seen - in a single century. Such was the success of the policy called protectionism that is so disparaged today".

Buchanan's analysis is nevertheless highly disputed and diametrically opposed for as much as he attributes the growth and prosperity of America to protectionism do others contend that this was achieved in spite of import restrictions and not because of them.

In summary, however, protectionism appears largely to have been a product of economic conditions and not merely theoretical perspectives and the degree and extent to which such measures form part of the policy fabric supporting indigenous SMEs evidently recedes, in general terms, with increased prosperity as

economies seek markets for their wares, only to make a return in times of economic strife and when imported goods prevail or threaten to prevail over indigenous product. For example, in Britain, as noted by Paul Kennedy (1987): "Between 1760 and 1830, the United Kingdom was responsible for around two-thirds of Europe's industrial growth of output...With 2 percent of the world's population and 10 percent of Europe's, the United Kingdom would seem to have had a capacity in modern industries equal to 40-45 percent of the world's potential and 55-60 percent of that in Europe... It alone was responsible for one-fifth of the world's commerce, but for two-thirds of the trade in manufactured goods". It is alleged that it was against a backdrop of economic prosperity, that Adam Smith's 'The Wealth of Nations' led and seemingly won the intellectual battle in favour of Free Trade (Fay, 1931; Chalk, 1954) defeating the doctrine of mercantilism (1820) and marked by the repeal of the Corn Laws in 1846 (Thomas, 1929) and the Navigation Acts in 1849 (Clapham, 1910) and later the Anglo-French Commercial Treaty of 1860 (Dunham, 1930). The move to free trade and away from protectionist policies was, however, subsequently reversed, in response to the introduction of protectionist policies in Germany in 1879 (at the behest of large enterprises (Bohme, 1967) and elsewhere in Europe (Bairoch, 1989) and in light of other political imperatives, which included for example, a change in the largely laissez-faire policy approach to colonization, commerce, industry and agriculture which was replaced (1886-1914) by more interventionist approaches designed to foster trade within the British Empire and so extend Britain's influence around the world (Knowles, 1926).

While protectionist measures still featured in the armoury of industrial policies designed to support and promote indigenous industry throughout the 18th, 19th and 20th century, they are now increasingly difficult to sustain against the tide of globalisation and in light of a range of successive multi-national agreements which might be traced to October 1947, when the General Agreement on Tariffs and Trade (GATT) was agreed between 23 countries in Geneva, Switzerland. Later, in November 1947 delegates from 56 countries met in Havana, Cuba, to negotiate the charter of a proposed International Trade Organisation which was agreed in March 1948 by some 50+ countries but rejected by the US Congress. Nevertheless, in subsequent, years 1949 (Annecy, France) and 1950 (Torquay,

England), the GATT countries exchanged approximately 13,700 tariff concessions reducing 1948 tariff levels by an estimated 25%. Between 1955 and 1979 a further 4 rounds of talks produced agreements resulting in a combined $347 billion in tariff reductions. The period is also notable for the fact the 1960-62 GATT round involved negotiations related to the creation of the European Economic Community, while the 1973-79 produced an agreement not only on the reduction of tariffs but also trade barriers. More recently, the 1986-93 trade round was notable for major reductions in agricultural subsidies, an agreement to allow full access for textiles and clothing from developing countries, and an extension of intellectual property rights.

With the liberalisation of trade established (arguably) as a general point of principle (political and economic) the World Trade Organisation was created in Geneva in 1995, marking a move towards a global framework of free trade and (at best or worst) a new basis upon which trade and economic relations could be conducted. As is evident from the above, notwithstanding an increased global commitment to free trade, support measures (tariff and non-tariff) for indigenous enterprise remain an integral element of industrial policy as nation states seek to compete for economic power within industries and technologies. Consequently, this political and economic accord is something of an uneasy alliance and is evidently fractious as members continue to seek to find ways (tariff and non-tariff) of protecting and promoting indigenous businesses with subsidies and equivalent protective measures as illustrated by numerous disputes and WTO rulings which include, for example:

- having introduced tax breaks for US exporters, the EU's decision by way of response to introduce $4billion sanctions against the US, was approved in August 2002 by the WTO;
- duties imposed by the US on steel imports were ruled illegal by the WTO in December 2003;
- WTO talks in September 2003 collapsed following disagreements on farm subsidies;

- the EU was authorised in February 2004 to introduce sanctions, again against the US for refusing to repeal an 88 year old statute allowing US firms to sue low-price importers;
- in April 2004 and in March 2005, the WTO ruled US subsidies in favour of cotton farmers were unfair and illegal; and
- in August 2005 the WTO declared a European Union tariff on imported bananas illegal backing a claim brought by Latin American countries that the new tariff which purportedly aimed to safeguard exports from countries in the African, Caribbean and Pacific (ACP) group (mainly former EU colonies which had, historically received preferential treatment within the EU for their crop) would have a "devastating effect" on their economies and exports.

Most recently, and at the time of writing, the EU is currently locked in row with China vis-à-vis textile imports, following the abolition of a quota system which has historically protected EU textile producers. The quota system has been abolished as part of the process of liberalising trade with China and China's admission to the WTO.

In summary, while business incubation may now be 'flavour of the month' the world over and seemingly attracts more 'column inches' within and outwith the scholarship, it is evident from the above that protectionist measures (e.g. quotas) to support indigenous enterprises remain part of the policy 'mix'.

3.4 Promotion of Mergers & Acquisitions

Protectionism is not the only medium that has been deployed by developers to support indigenous industry and engineer both competitive and comparative advantage. Mergers and acquisitions were promoted throughout the 1960s, 70s and 80s (particularly, in the UK and Europe) on the presumption that the integration of businesses and their operations would facilitate further economies of scale and enhance competitiveness against for example America's corporate giants, Japan's Keiretsus and Korea's Chaebols.

Specifically, the European rationale might be illustrated with reference to the work of Servan-Schreiber (1968) who warned of the "American Challenge" in the form of the "dynamism, organization, innovation, and boldness that characterize the giant American corporations" (p.153). As America's LSEs were largely considered to be the engine of growth and innovation, Servan-Schreiber (who was by no means alone) advocated the "creation of large industrial units which are able both in size and management to compete with the American giants" (p.159). According to Servan-Schreiber (p. 159): the problem for industrial policy makers in Europe was [then] "choosing 50 to 100 firms which, once they are large enough, would be the most likely to become world leaders of modern technology in their fields. At the moment we are simply letting industry be gradually destroyed by the superior power of American corporations".

Subsequently, a new economic reality (see Chapter 2) which prompted a policy shift and new focus and concern for small and medium sized enterprises, particularly a change in industrial dynamics where industrial restructuring produced high levels of unemployment and a belief (amongst academics and policy makers) that small firms would be the principal source of new jobs, offsetting the contraction that was taking place in larger industrial enterprises (Birch, 1987). Furthermore, in UK for example, within the automotive and IT sector - two sectors which had been reorganised at government behest into larger groups - several of the groups or 'giants' created by the state-sponsored mergers performed poorly (Owen, 2004). Indeed, many of the industrial behemoths that had very much dominated world economies and policy concerns came under increasing pressure through the globalisation of trade (specifically increased/internationalisation of supply without a concomitant increase in demand). In short, large, vertically integrated corporations were increasingly perceived as being less than an optimum form of business organisation, inherently unwieldy, bureaucratic, inflexible, ponderous and seemingly out of step with the new economic reality (Langlois, 2003), prompting many to re-evaluate and differentiate between what were and were not core business(es) and hive off unwanted businesses, sometimes through management buy-outs. Further, deregulation and privatization of nationalized industries in for example the UK, Australia, Finland, Italy and Sweden (OECD, 1995) began to undo many of the

great and vertically integrated and publicly owned industries and in so doing, it is argued, fuelled increases in the SME stock.

3.5 Subsidies for indigenous enterprise and/or attract foreign direct investment (FDI) and/or inward investment

Within and outwith the free trade framework(s), direct investment in or subsidy for indigenous businesses (new and/or existing businesses) proceeded largely unfettered until tempered by international trade agreements concerning competition (free trade-see above) and, in Europe by European State aid rules agreed as part of the treaty that founded the European Community Article 88(3) which aim to ensure fair competition and, in Europe, a single common market (and comparable international reciprocal agreements). The degree to which subsidies, and in particular approaches or subsidies designed to attract inward investment (e.g. FDI), have fallen out of favour might perhaps be best illustrated with reference to the European Commission - DG Regional Policy (Landabaso and Mouton, 2002, page 2):

> "Generally a large number of jobs are created overnight, usually with a statement from the leading public figure in the field making the front page of the regional or national press. This is, of course, much more spectacular but considerably less significant economically than, for example, creating one or two extra jobs in some of the hundreds or thousands of regional SMEs by stimulating internal capacities and local synergies, which is what an effective industrial/regional policy can realistically achieve"

This point might also be illustrated with reference to the experience of FDI as observed in the North East of England (one of Europe's 'less favoured' or indeed 'least favoured' regions) where the modality has been deployed with 'mixed' fortunes. By way of example, Nissan Motor Manufacturing (UK) Ltd is heralded as a major policy success (and in its own right), employing 5,000 at the Sunderland plant (with an estimated 12,000 people now working in the automotive sector in the City of Sunderland) and setting productivity records (most productive

car plant in Europe for the last seven years) and said to produce a fifth of all cars produced in the UK, export 75% of production to 45 countries including Japan (in 2004 the figure reached 79.5%[1]) and is estimated to contribute around £400 million to the local economy each year, with 240 suppliers within the region[2]. The Nissan plant is credited as enabling the region to develop a reputation in automotive manufacturing, triggering or supporting the development of other indigenous and globally competitive automotive and supplier businesses (Unipres UK Ltd. (Japan); TRW Systems Ltd. (USA); Magna Kansei Ltd. (Japan / Canada); S P Tyres UK Ltd. (USA); Johnson Controls UK Ltd. (USA); Calsonic Kansei (Japan); and R-Tek Ltd. (Japan / USA)) and an automotive cluster.

This might be contrasted with the fortunes of the microchip factory established by the German engineering group Siemens at Silverlink, North Tyneside in 1999. According to Liddle and Corcoran (1996) the grant package to support the FDI amounted to £30million (Regional Selective Assistance), a combined £15 million from the North Tyneside City Challenge fund and the Tyneside Training and Enterprise Council (TEC) towards infrastructure development and training, respectively, £15million from English Partnerships for site preparation and an additional £150,000 from North Tyneside Council.

Further, in addition to the financial commitments of central government and the local agencies, there was, according to Liddle and Corcoran, a comprehensive set of non-financial commitments to support Siemens' investment e.g. zero-rating for the majority of the site and a change in the direction of North Tyneside's City Challenge programme to support the company's needs. Trumpeted, initially, as a major national and regional coup (politically and economically as the company was also contemplating making its investment in Austria), and forecasted to generate 1,800 jobs and said to comprise £1.1 billion of investment, the plant ceased operations in advance of achieving full operative

---

[1] BBC (2005) 'New Nissan car will secure jobs', Wednesday, 2 February, 2005, 06:23 GMT retrieved on 14.05.05 from website: http://news.bbc.co.uk/1/hi/england/wear/4225291.stm

[2] Sunderland City Council (2005) retrieved on 14.05.05 from website: http://www.sunderland.gov.uk/Public/Editable/Themes/Business/Invest-in-Sunderland/automotive-manufacturing.asp reported

capacity within 18 months of opening and is often cited to highlight weaknesses in approaches geared to FDI.

Subsidies and policy approaches concerned to attract FDI have also been the target of additional criticisms insofar as they generally fail to attract the high value added processes and functions such as R&TD and strategic functions (Headquarters) which are generally retained in the region/country of origin (and where they are often incentivised to maintain this capability) and where the strategic decisions, not least on the location and delocation of business activities and investment are taken and on the basis of criteria outside the control or influence of the region receiving the investments. According to Mikel Landabaso and Bénédicte Mouton (2002) citing Tidd et al, (1997) "Less than 10% of innovative activities of the world's largest 500 companies are located outside their countries of origin... production activities are internationalised at about 25% and marketing is much higher"(COTEC, 1998).

Indeed, regardless of their perceived success or failure, such high profile projects have had, and continue to attract, their share of criticism insofar, as for example:

(a) A region (or part thereof) may become too dependent on a particular employer in social, economic and political terms. Thus political stakeholders (national, regional and local) are beholden to continue to support such enterprises by creating e.g. favourable tax and planning regimes and subsidise investment as a failure to do so may prompt the FDI to look elsewhere for more favourable treatment and/or supportive conditions. It is reported, for example, that "Nissan has received £170m of government grants or regional selective assistance to subsidise the plant since it began car production two decades ago"[3]. However, against a back-drop of increased competition, talk of plans to relocate production in Sunderland to the euro-zone (in advance of the UK general election of the

[3] The Journal (2004), 'Every Nissan job drives two more on the outside', Oct 22, 2004, retrieved on 15.05.05 from website:

7th of June 2001[4]) evidently concerned the UK national government so much that Nissan was awarded a £40 million UK Government Grant (approved by the European Commission in January 2001[5]) to enable the plant to secure a £203 million contract for the Nissan Micra and despite the fact the it was reported that even with the grant there was up to a 17% reduction in components sourced from UK manufacturers[6]. The political context (nee imperative) for the subsidy was notable (as was the political pressure levered locally and regionally). Indeed, the company may be said to have timed its approach to local, regional and the national government perfectly i.e. the political consequences of a collapse of a whole sector of a regional economy (and such a significant sector – as measured in employment terms) or rather the prospect thereof) on the cusp of a general election, particularly in the heartland of the ruling government party (combined with the fact that the relocation of production to France threatened was explained (to the public) as a consequence of the government's stance on joining the euro was, no doubt, telling[7]).

(b) Businesses supported through subsidy, especially subsidised FDIs, may be impacted by other influences such as geo-political concerns (for example, the recession that hit Japan circa 1990 which according to Sakakibara (2001) persisted until 2002), prompting government and public pressure to persuade leading Japanese businesses to invest in their country of origin as opposed to making FDI and relocate operations in the home country); and/or broader concerns within, for example, a group. As regards Nissan in Sunderland, the fortunes of the largely state owned Renault, which acquired a 36% stake in Nissan in March 1999 and in the face of global competition for its own products prompted the company (Renault) to rationalize production and raise the spectre that production in Sunderland

---

http://icteesside.icnetwork.co.uk/0400business/teesvalley/tm_objectid=14981439&method=full&siteid=50081&headline=every-nissan-job-drives-two-more-on-the-outside-name_page.html

[4] BBC (2000) 'Blair in talks over Nissan jobs', Monday, 31 July, 2000, 11:51 GMT 12:51 UK retrieved on 16.05.05 from website: http://news.bbc.co.uk/1/hi/business/858265.stm

[5] BBC (2001) 'From Datsun to Nissan' Thursday, 25 January, 2001, 17:18 GMT retrieved on 16.05.05 from website: http://news.bbc.co.uk/1/hi/business/1136490.stm

[6] BBC (2001) 'Q&A: Why Nissan chose the UK' Thursday, 25 January, 2001, 12:54 GMT retrieved on 16.05.05 from website: http://news.bbc.co.uk/1/hi/business/1136312.stm

[7] On the eve of the UK's 2005 general election, again an automotive producer approached the UK government for assistance (MG Rover) but on this occasion (and albeit in different circumstances) without comparable success.

of Nissan cars might be relocated to France and mainland Europe to prop up manufacturing plants there.

(c) Indigenous supplier businesses (within e.g. a cluster) may not be sufficiently diverse and/or may be financially beholden/dependent on the larger business for example Unipress (noted above), which employs 890 reportedly relies on Nissan for 75% of all its business[8]. Where employment opportunities outside e.g. the cluster may limited, when confronted by employer demands (e.g. changes in working conditions, the indigenous population (whether labour is unionized or not) may be largely beholden to accept e.g. working conditions and create/maintain conditions that upskill labour while keeping wages and employee rights/protection low, regulation to a minimum and specialisation.

Notwithstanding the wealth of criticism they continue to attract, subsidies like protectionist measures, remain part of the policy mix. However, they now seemingly occupy in regional economic and political terms a lesser role as compared to strategies and approaches concerned with the development of indigenous capability (initiatives to develop indigenous human capital, entrepreneurialism and ultimately business incubation).

3.6 Systems of supranational, national, regional and local grant aid

In the US, at for example State level, and within and outwith the 'Less-Favoured' regions of Europe (nations and regions thereof) government authorities and agencies (national, regional and local) operate or support a raft grant schemes and initiatives to support indigenous industry (i.e. Innovation and R&TD, training, etc) including SMEs (and for which many incubators act as brokers/provide services in support of grant applications- i.e. preparation of grant applications, partner search/brokerage, project management, etc - see below and case studies).

---

[8] The Journal (2004) 'Every Nissan job drives two more on the outside' Oct 22 retrieved on 16.05.05 from website: http://icteesside.icnetwork.co.uk/0400business/teesvalley/tm_objectid=14981439&method=full&siteid=50081&headline=every-nissan-job-drives-two-more-on-the-outside-name_page.html

In the EU, for example, R&D grants for indigenous industry via the European Commission's Framework Programmes will soon enter their seventh incarnation while in the US (at the Federal level) the US Departments of Agriculture; Commerce; Defense; Education; Energy; Health and Human Services; Transportation; the Environmental Protection Agency; the National Aeronautics and Space Administration and the National Science Foundation are required by US Office of Technology Small Business Innovation Research Program (SBIR) to reserve a portion of their R&D funds for award to small businesses and similarly the Small Business Technology Transfer Program (STTR) again requires the Departments of Defence; Energy; Health and Human Services; the National Aeronautics and Space Administration and the National Science Foundation to reserve a portion of their R&D funds for award to small business.

In the US, the SBA and NBIA promote a range of grant programmes and initiatives to support, for example, R&TD, training, business start-up, special loans, etc, while in the EU, as may be observed from the case studies below, Coventry BIC for example promotes EU Framework Programmes, providing indigenous SMEs with a range of support to access this particular grant regime that includes information, assistance in the preparation of grant applications, partner/project/technology searches, contract negotiation, etc.

Elsewhere in Europe, a pan-european network of BICs including in their number: 'Innotek' and 'Socran' (Belgium); 'BIC Brno', 'BIC Ostrava' and 'BIC Plzen' (Czech Republic); 'Culminatum' and 'Hermia Yrityskehitys' (Finland); 'Cicom' and 'Thesame' (France); 'BIC Frankfurt' and 'Wista Management' (Germany); 'BIC of Attika' (Greece); 'Innostart' (Hungary); 'BIC Dublin' and 'SE BIC' (Ireland); 'BIC Lazio', 'EUROBIC Abruzzo e Molise', 'Promofirenze', 'Tecnopolis CSATA' (Italy); 'BIC Twente' (Netherlands); 'NET' (Portugal); 'BIC Bratislava' and 'BIC Cassovia' (Slovakia); 'BIC Euronova', 'CEEI Ciudad Real', 'CEEi Valencia'; 'Cimtec' (Switzerland); 'Birmingham BIC', 'Kent Technology Transfer' (UK) support SMEs to access this and other EU Commission grant regime. Notwithstanding their support however, the EU Commission has yet to achieve its target of 15% of EU research funds reaching SMEs i.e. 85%+ is currently absorbed by Europe's LSEs.

At a national and regional level in, for example, the UK a number of government departments (e.g. DTI, SBS) offer business grants or 'research awards and/or commissions' for indigenous firms to support innovation, research and technological development that include:

- Knowledge Transfer Partnerships wherein business are part funded to pursue projects of between 1 and 3 years duration with a university, college or research organisation with expertise to e.g. support R&TD and this improve profitability;

- SMART Grant Awards offering a grant of up to 75% of the cost of carrying out a technical and commercial feasibility study lasting between 6 and 18 months and up to £50,000;

- SPUR Grant Awards supporting SMEs to develop new products and processes involving a significant technological advance for the UK industry or their sector and up to pre-production prototype stage (A fixed grant level of 35% of eligible costs, up to a maximum grant of £150,000 may be offered to projects of between 6 months and 3 years in duration, which involve eligible projects costs of at least £75,000); and

- SpurPlus Grant Awards which provide grant awards of unto £500,000 at 35% of eligible costs to support the development of leading edge technologies in areas such as telecommunications and biotechnology up to pre-production prototype stage.

At a regional level a range of aid instruments have proliferated to attract and/or support local firms. For example, in the environs of the North East of England Business and Innovation Centre in Sunderland (see Case Study below) a range of instruments are available via the local authority that includes:

- 'Selective Finance for Investment' (SFI) from the UK Government at a rate of up to 20% of the value of a project;

- Discretionary grants offered to manufacturing businesses and service industries supplying to e.g. national/international markets and making local investments that involve capital expenditure on fixed assets that, creates and/or safeguards jobs and provides net benefits to the UK economy, contributing to increased productivity and skills (Grant awards have been/are often scaled to the level of private sector capital expenditure, number of jobs created and level of additionality, etc), e.g. Nissan UK was, according to the Automotive Unit of the DTI (2003) awarded (in 2003) £3.26 million Government support (as part of a £95 million investment by Nissan) for production of a new model securing 250 jobs[9]; £5 million UK Government grant (Regional Selective Assistance) as part of £223 million investment creating (according to the City of Sunderland and BBC news reports) 200 jobs and safeguarding another 1,000[10].

- Rent relief grants equivalent to e.g. 25-50% of the rent payable for up to one year to eligible businesses creating new jobs, occupying new or larger privately-owned industrial premises and taking up leases of at least 3 years.

- Basic Services Grant supporting e.g. 50% of eligible costs in securing essential basic services to industrial premises, covering such items as a new electricity or gas supply, drainage works (including toilets) and canteen facilities, as well as the preparation of land for the construction of industrial premises.

- Interest Relief Grants e.g. equivalent to 5% per annum of the value of loans used to purchase machinery or buildings for industrial use, awarded for up to half the duration of the loan and a maximum of 2 years.

---

[9] Automotive Unit of the Department of Trade and Industry (2003) retrieved on 20.07.05 from website: http://www.autoindustry.co.uk/news/press_releases/04-12-03_1

[10] Sunderland City Council (2005) retrieved on 12.05.05 from website: 19.07.05http://www.investinsunderland.co.uk/support-grants.asp retrieved from for Business and Investment; and BBC(2005) 'New Nissan car 'will secure jobs', Wednesday, 2 February, 2005, 06:23 GMT, retrieved on 14.05.05 from website:http://news.bbc.co.uk/1/hi/england/wear/4225291.stm

- Removal Grants covering up to e.g. 50% of eligible costs for companies moving into industrial premises in the region, whether they are relocating from outside the area or they are moving from one property within the City to another.

- Business Marketing Grants to firms employing e.g. less than 50 people that are undertaking a promotional campaign as part of an overall marketing plan, covering up to 50% of the cost of items such as the design and print of brochures and other promotional material, up to a maximum of £1,500.

In summary, a raft of instruments has evolved over time to support indigenous industries and firms. While much of industrial policy has historically been reactive by nature i.e. a policy response designed to support indigenous industry in the face of increased competition from abroad (protectionism and government sponsored mergers and acquisitions) this has given way (largely as a consequence of free-trade and the emergence of SMEs as a significant unit in the economic structure) to policy approaches designed to build indigenous capability and capacity.

Notwithstanding free-trade agreements a range of governmental initiatives and instruments offering grant or financial aid to indigenous firms under an R&D banner now proliferate throughout the US and Europe. Similarly, grants to attract foreign direct investment or inward investment are a significant part of national and regional government armouries to support economic development and growth. While LSEs still seem to be the greatest beneficiaries and that such systems of aid do not always sit comfortably within the scope of free-trade principles, it is nevertheless accepted as one of the chief means through which governments may support indigenous firms (LSEs and SMEs).

3.7 Business Support for Small Businesses & Business Incubation

More recently, however, with the advent of globalisation and radical changes to the economic structure which have borne witness to the emergence of SMEs as critical to the innovation system, the demographics of employment and national and regional GVA (and an appreciation thereof), new approaches to support SME development have emerged.

In the US, the move to support small firms was founded on a political concern that large enterprises had achieved a level of pre-eminence, nee dominance, that was unhealthy at best, a sentiment that found its first expression in the first US antitrust legislation - the Sherman Act of 1890. Notwithstanding this sentiment, however, there is little to suggest that this dampened the consolidation of US industry (achieved through vertical and horizontal integrations – mergers and acquisitions – which were subsequently aped in Europe). Indeed, not until some sixty years later did the United States establish the Small Business Service in 1953 (consolidating a range of work developed and executed by a number of predecessor agencies which were created largely as a response to the Great Depression, namely the Reconstruction Finance Corporation (RFC) established by President Hoover in 1932 and the Second World War wherein Congress created the Smaller War Plants Corporation (SWPC) in 1942 to support small business to participate in war production (which was then dominated by larger firms) and provide them a level of financial viability (via direct and encouraging large financial institutions to make credit available to small enterprises, and advocating small business interests to federal procurement agencies and big businesses).

Dissolved after the war, the SWPC's lending and contract powers were transferred to the RFC while the Office of Small Business (OSB) in the Department of Commerce also assumed some responsibilities (largely concerned with education, provision of information and management counselling for individual entrepreneurs). Abolished in 1952, the RFC was replaced by the Small Business Administration, established by the US Congress in the Small Business Act of July, 1953 to preserve what was considered to be inefficient enterprises, which, if left unprotected, might otherwise become extinct and specifically to "aid,

counsel, assist and protect, insofar as is possible, the interests of small business concerns".

The charter also stipulated that the SBA would ensure small businesses a "fair proportion" of government contracts and sales of surplus property. In addition, the SBA provided direct loans to business and to victims of natural disasters, guaranteed bank loans to small firms, and provided management and technical assistance and business training. The SBA's remit was later extended in 1958, prompted by a Federal Reserve study which had found that small businesses could not obtain credit to support technological advancement, with the introduction of the Small Business Investment Company scheme (Investment Company Act of 1958), through which the SBA licensed, regulated and helped provide funds for privately owned and operated venture capital investment firms and long-term debt and equity investments to high-risk small businesses.

Similarly, in the UK just as in the US, the preservation of SMEs also began to occupy policy makers, most notably after WWII. Just as the US SBA evolved a concern as to the impediments to entrepreneurship in, for example, the financial system, the Macmillan Committee arrived at a similar conclusion (in 1931) and recommended that a new type of capital-raising agency, specialising in small business support be established. This was not however implemented until the Industrial and Commercial Finance Corporation (ICFC) was created at the end of the war with a remit to supply risk capital to smaller firms. As in the US, the main thrust of the UK policy in support of indigenous SMEs was initially concerned with access to finance and subsequently under the supervision of The Industrial Reorganisation Corporation and Ministry of Technology with 'facilitating' or 'engineering' consolidation within sectors and fragmented industries; largely in response to the economies of scale being achieved in the US via vertical and horizontal integrations (mergers and acquisitions).

According to Owen (2004), and in contrast with the US, a concern for SMEs did not however manifest itself in UK government procurement strategies. Owen notes that in the UK, government procurement (particularly the Ministry of Defence) favoured larger firms (who it is argued were instrumental in the

definition of policy and had the resources to lobby and represent their interests on government committees) "Unlike the US Department of Defence (whose procurement budget was very much larger), British officials did not deliberately seek to encourage innovative small firms". Evidently, it was not until increased anxiety at the end of the 1960's as regards the fortunes of smaller firms in the UK (and as compared to their US counterparts), US economic dominance and the effects of industrial restructuring that SMEs became the focus of a committee of inquiry in 1969.

The subsequent Bolton Report highlighted the decline of SMEs, a range of structural impediments inhibiting SME growth and moreover the importance of SMEs to national competitiveness. Subsequently, the National Enterprise Board was established to support promising high-technology ventures which were difficult to finance through conventional sources and take a stake in small firms (in high-tech sectors) to accelerate their growth (largely a mirror of US policy instruments being implemented by the US SBA). In addition, a policy concern for SMEs was stimulated further by changes in the intellectual property regime of the US (the Bayh-Dole Act (1980), PL 96-517) - see below - which gave universities the right to exploit government funded research results) and a US policy concern to promote industry-university collaborations in the field of innovation. Almost by way of response the UK government was prompted to reconstitute the National Research Development Corporation and the residue of the National Enterprise Board as the British Technology Group (1985) and as in the US gave universities the right to exploit their own innovations and support to ramp up their technology transfer activities.

Elsewhere, in Japan for example, support for SMEs was seemingly less an organic or incremental response to the pressures of globalisation and economic restructuring (as explored in Chapter 2) and rather a more 'urgent' and programmed response. In 1999, at a time when unemployment was at its highest level with industry (particularly manufacturing) struggling with restructuring and a rate of business start up conspicuously lower than e.g. the USA which was in any event trailing the rate of business closures (USA: business starts 13.8%, closures

11.4% (1994) Japan: business starts 3.7%, closures 3.8% (1994-96) the Japanese Ministry of International Trade and Industry (1999, p1) was 'concerned':

> "In order to break out of the present recession in the economy and secure more employment opportunities, creating new business must be seen as a prime policy task. This should be achieved through comprehensive policy packages, including budget measures, taxation measures, and deregulation, as well as appropriate management of the macro-economy. In line with the Industrial Rehabilitation Plan initiated by the Prime Minister, Ministry of International Trade and Industry has enacted all-embracing legislation to support new business (Law for the Promotion of New Business Creation), in addition to the budget measures in the Emergency Special Framework for Economic Countermeasures".

As may be observed above, SMEs were suddenly key and 'frontline' to the rehabilitation of the Japanese economy and the government legislated accordingly. The Law for Facilitating the Creation of New Business was swiftly enacted to provide broad support:

- for individuals (whether by individuals (retired company employees, housewives, students, etc), medium/small companies (and spin-offs), and others wanting to start up new business;
- business activities by medium/small enterprises that make use of new technology; and
- The development of a business environment that makes use of regional industrial resources.

Other measures included:

- a grant regime operated by the Small Business Corporation to support business/product development, testing and manufacture;

- a debt guarantee scheme for business start-ups; exceptions to the stock option system; a capital investment fund (Industrial Structure Improvement Fund) for e.g. industrial spin-offs and start-ups;
- R&D grants/subsidies and for SMEs;
- government/public authority procurement targets [from SMEs];
- the Technopolis Law, the Key Facilities Siting Law (abolished with the enactment of the Law for Promotion of New Enterprises) and the Brain Location Act;
- tax relief for SMEs;
- capital for new business support facilities ("incubators") via the Regional Development Corporation; and
- Measures to promote coherence in the SME business support infrastructure (unification of the Technopolis Foundation, the Small Business Promotion Corporation, and others) to better support research and development to commercialisation.

Distilling policy approaches observed elsewhere, in for example the US and Europe as regards the development of indigenous SMEs and entrepreneurialism, the Japanese government has also enacted measures to:

- supplement regional policies and inward investment strategies designed to attract new industries (e.g. development of roads, harbours, and other hard infra-structure);
- support the development of research equipment, research facilities and the provision of subsidies for research and development;
- promote the development of urban areas by integrating industry, academia, and concentrations of population around cutting edge technologies;
- advance the regional distribution of plants and concentration of service industries that support industry, e.g. natural science research institutes, the software industry, and the information processing service industry;
- utilise regional industrial resources in order to develop a business environment that encourages creation of new enterprises in local areas via programs (regional platforms) for comprehensive provision of the

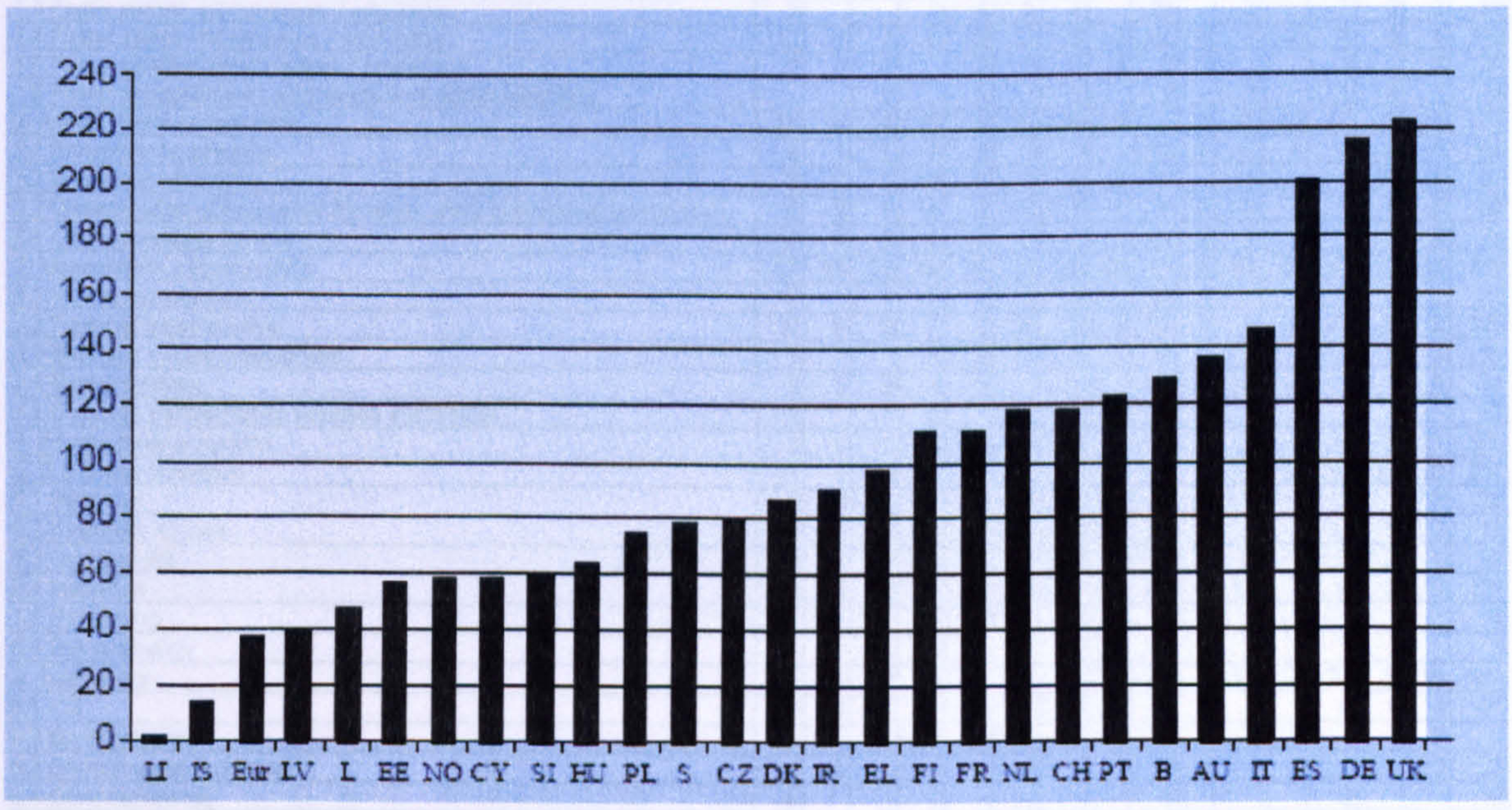
technological, personnel, and financial support required at every stage in the creation of new enterprises in local areas, from research and development to investment in business enterprises, and promotes the development of business incubators and leased plant sites in High-Tech Industry Integration Regions and Advanced Research Function Integration Districts.. (Law for Promotion of New Enterprises, Section 4);

- support regional development by concentrating industrial, cultural, scientific, research, exchange, and other functions characteristic of a region (the Multipolar Act);
- promote and support the private sector research base (capacity and capability) via the development of R&D and commercialization infrastructure facilities (research centres or 'cores');
- support collaborative working between industry and academia (and utilization of public sector research assets (expertise and facilities) by private sector);
- develop telecommunications research and development promotion facilities(Telecom Research Parks);
- support for facilities to support agriculture, forestry, and fisheries R&D and commercialization and the revitalization of coastal regions (the Private Sector Resources Utilization Law); and
- Support indigenous enterprise in areas where traditional industries (manufacturing) were in decline (with concomitant economic and social consequences for many 'one company towns') to develop and or diversify away from historic reliance on local OEMs. The Regional Industrial Concentrations Reinvigoration Law aims to support this renewal by establishing R&D and experimental facilities, research equipment, etc., to support the development of new and advanced technologies, markets and human resources[11].

[11] Japan's Ministry of Education, Culture, Sports, Science and Technology http://wwwwp.mext.go.jp/hakusyo/book/hpag200301/hpag200301_2_099.html accessed 26.02.05

In the EU there is now an array of EU business support measures[12] designed to support SMEs as summarised in the chart below and by country. The Support Measures and Initiatives for Enterprises (SMIE) database financed by the Enterprise Directorate-General of the European Commission provide an integrated information resource on business support measures for the EU. The database identifies more than 1900 measures from EU Member States and 600 measures from other countries i.e. candidate states (CY, CZ-REP, EE, HU, LV, PL, SI), EEA (IS, NO, LI) and CH as illustrated below:

Figure 3.1: Profile of Business Support Measures by Country



Source Data: European Commission Enterprise Support Measures Database

Notably, as may be observed from the graph (above), a number of the 'less favoured' regions with a GDP less than the EU average (UK, Germany, Spain and Italy) have implemented considerably more business support measures than 'more favoured' regions.

---

[12] Business support measures refer to the broadest group of public and semi-public business support actions that include "business support services", but also indirect support provided by grants, programmes and tax incentives intended to support businesses. Further the business support measures featured are those originating as or in a public policy initiative, targeting SMEs by

From an analysis of data extracted from the EU Commissions SMIE database of business support measures as provided by either public or private organisations or indeed, by individuals (in all cases though, the service providers act as agents for the public authorities) it is possible to identify a range of objectives that include support for employment and training, international co-operation, management capacity-capability, foreign trade, research and development, particular technologies and environmental programmes.

Table 3.1: Profile of EU Business Support Measure by Objective

Measure objectives																
EU countries	A	B	DK	FIN	F	D	EL	IRL	I	L	NL	P	E	S	UK	Total
1. Employment & training	13	16	13	5	11	20	14	14	8	4	19	18	24	19	28	226
1.1 Education and training	10	20	3	18	10	10	14	4	25	2	3	1	5	6	4	135
1.2 Job creation	15	34	6	22	42	36	11	6	40	12	9	3	28	7	13	284
1.3 Foster women entrepreneurs / employees	2			3	4	7	4		23		2		7	3	2	57
1.4 Foster young entrepreneurs / employees	12	1	2	8	13	11	5	2	24	5	4	1	9	5	8	110
1.5 Foster disabled entrepreneurs / employees	2	4	1		2	2	1	4	3				2	1	3	25
1.6 Foster entrepreneurs / employees from ethnic minorities			2		1		1		2		2		1	4	1	14
2. (Inter)national co-operation	12	6	19	19	9	15	16	5	5	4	11	12	17	8	13	171
2.1 Enterprise co-operation	5	1	1	13	2	3			22	1	2	1	4	5	5	65
2.2 Enterprise networking	3	2	1	10	7	1	5	2	11		1		1	10	8	62
2.3 Dissemination of knowledge (for target group of individual (enterprise))	5	2	1	15	6	3	7	1	6	3	6	1	1	4	5	66
2.4 Other knowledge transfer	6	1	2	4	4	2			12	2	4			3	6	46
3. Management capacity-skills	37	38	22	14	36	35	20	24	11	14	22	35	47	21	43	419
3.1 Quality management	2		1	2	1	3	3		14	2			3	1		32
3.2 Financial (re)structuring	10	6	3	7	3	25	3	3	21	3	9	6	22	5	2	128
3.3 Business culture development	1			7	2	14	1	1	13		2	1	7	4	3	56
3.4 Export strategy	3	3	9	4	3		1		4		4		1	1	6	39
3.5 Business transfer/family business succession	1		1	5	1				2	2						12
4. Foreign trade promotion	3	6	11	16	6	14	2		8	3	5	4	8	3	11	100
5. R & D and Innovation	21	9	16	16	18	40	12	13	17	8	12	13	18	13	28	254
5.1 Research	2	3	1	4		1			7		1				3	22
5.2 Feasibility studies	2	1		1				1	7					1	2	15
5.3 Development	3	3	1	8	5	1	2		36		3		3	3	1	69
5.4 Innovation	16	4	4	11	4	9	4	3	38	1	11	3	9	2	2	121
5.5 Prototyping		1				1	1				1					4
5.6 Demonstration	1					1							1			3
6. Technology	15	3	2	25	12	26	11	10	9	3	12	12	13	9	19	181
6.1 ICT	2	1		1		2	4				1		6	1	3	21
6.2 Bio-technology	1		1	2		1									2	7
6.3 Environmental technology	4	1				3	1		9	1			1		3	23
6.4 Other technology	5			1		1			5				6			18
6.5 Technology transfer	3	1	1	2	3	2	2		10	1	2	1	1	1		30
7. Environment	20	4	6	3	9	17	8	1	3	4	10	7	16	3	6	117
7.1 Pollution (general)	3	2	1	1		1	2		1	1	1	1	2		1	17
7.2 Energy saving	2	4	4	1	1	2	1	1	2	1	1	1	3	1	1	26
7.3 Other	1		1	2	1				5			1	5	1		17
Total	243	177	136	250	216	309	156	95	403	77	160	122	271	145	232	2992

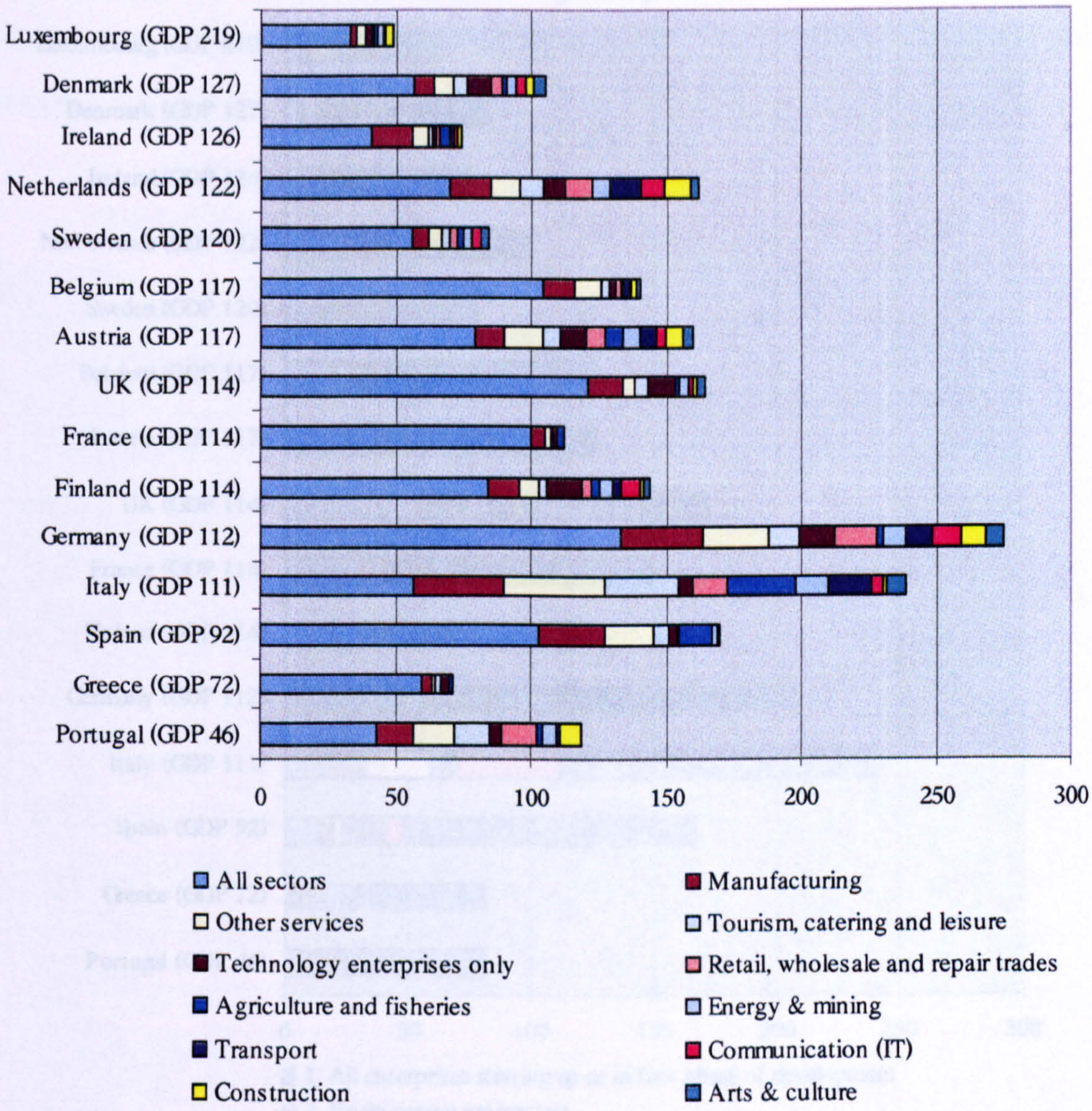
Source Data: European Commission Enterprise Support Measures Database

Evidently, 55% of business support measures across the EU are largely generic. Specifically, the manufacturing sector accounts for 9.77% of business support measures while other services account for 8.08% and Tourism, catering and leisure 4.64%.

---

explicit intention or practical use and offered at non-commercial conditions (and wherein a substantial part of the service is of the non-financial kind).

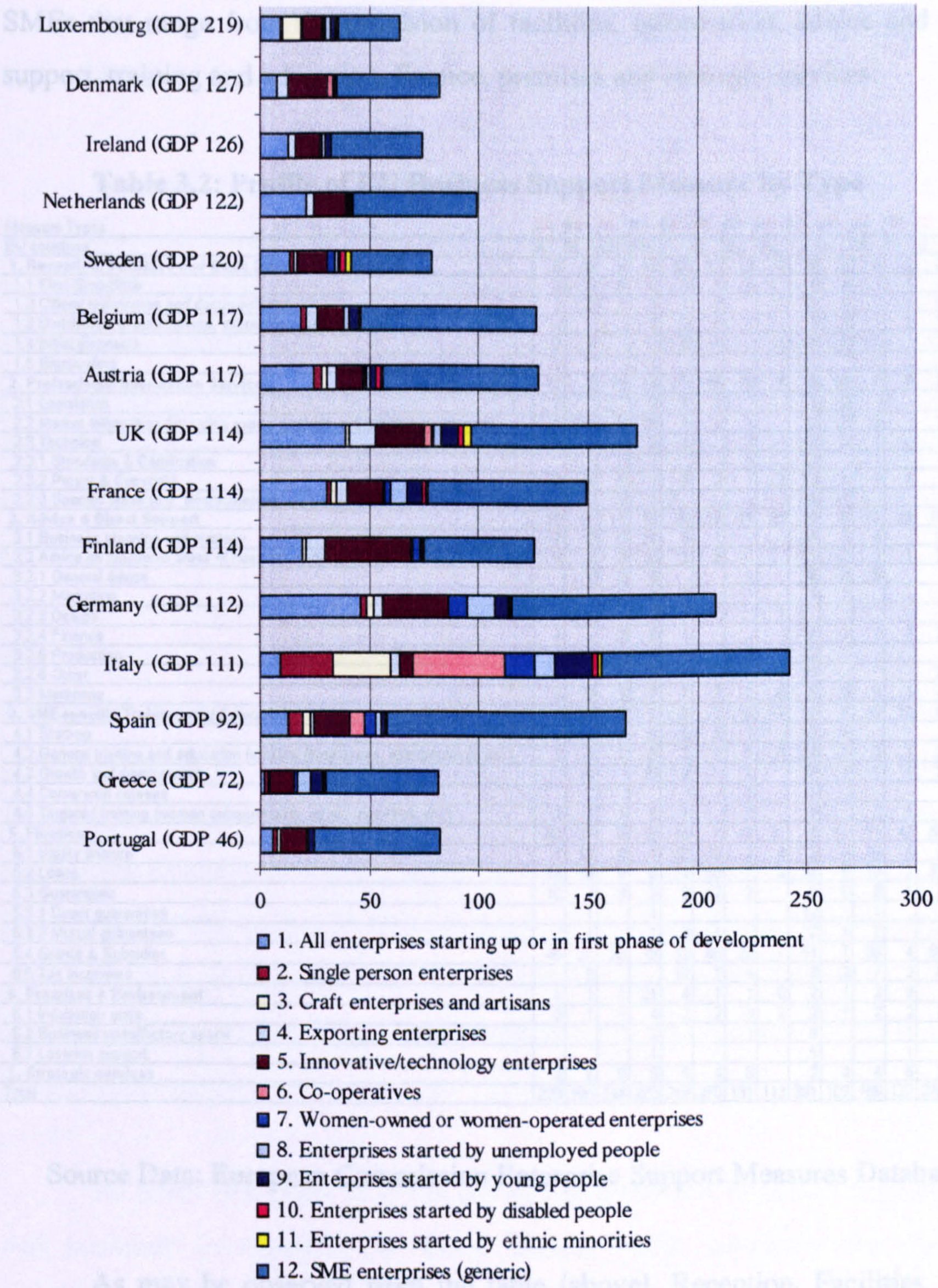
Figure 3.2: EU Business Support Measures by country & GDP



Source Data: European Commission Enterprise Support Measures Database

Further, as regards the deployment of business support measures in less-favoured regions, as compared to 'more-favoured' regions, they are as a rule, more numerous in 'less-favoured' regions while in terms of coverage Europe's SME stock, while just over half (50.85%) of all instruments and measures are concerned to support SMEs in general terms, support for business start-ups and innovative technology enterprises account for 14.66% and 12.85% of all business support measures, respectively:

Figure 3.3: Business Support Measure by Country and GDP and Target Population



Source Data: European Commission Enterprise Support Measures Database

In summary, as may be observed from the table below there now exists a range of business support measures, throughout the EU, to support indigenous SMEs that range from the provision of facilities, information, advice and direct support, training and education, finance, premises and strategic services:

Table 3.2: Profile of EU Business Support Measure by Type

Measure Types															
EU countries	A	B	DK	FIN	F	D	EL	IRL	I	L	NL	P	E	S	UK
1. Reception, Facilities and Basic Information, Referral	6	6	4	13	23	11	13	6	6	7	6	4	5	5	2
1.1 First-Stop-Shop	3	2	6	6	3	1	3		4	4		1	4	4	1
1.2 Official registration and documentation	2	1	1	2	1	1		1	13	4	1	1	2		1
1.3 Distribution of publications, information packages	4			5	3	1			7	3	1	1	2	5	2
1.4 Initial diagnosis	3	1		3	5	1		1	14	1	1		2	1	2
1.5 Signposting	2			1							1				2
2. Professional Information Services	12	2	10	14	13	13	15	7	5	10	7	9	7	10	16
2.1 Legislation	7			2	1	1			1	2				5	2
2.2 Market information (including export markets and public procurement)	1	2	8	10	1	1	1		3	2	2		2	1	10
2.3 Technical	3	1		2	1		1		2	3	1		1	1	4
2.3.1 Standards & Certification				1			1		2		1		1		1
2.3.2 Patent & Copyright	2	1	1	1	2	2	1	2	13	1	1	1		1	1
2.3.3 Specific areas (e.g. environmental)			1	1					4	1					2
3. Advice & Direct Support	15	14	11	15	28	19	11	25	10	9	11	16	18	20	41
3.1 Business planning and strategy	7	2	5	24	3	1			34	3	4		9		5
3.2 Advice on functional areas of business activity	6	4	3	20	2	3			11	2	3	1	7	1	5
3.2.1 General advice		1	2	5			1		6	2	6			2	
3.2.2 Marketing			5	7	1				1	1					2
3.2.3 Design		1		2	2			1							
3.2.4 Finance	4		2	8	1				17	1	1	2	2		1
3.2.5 Production	1		1	2	1		2		12						1
3.2.6 Other				2	1				25				2		1
3.3 Mentoring	4	9	3	7	7	7	2	6	5	2	9	1	4	7	9
4. SME-specific Training and Education	4	17	8	7	9	7	19	11	12	7	6	10	6	10	9
4.1 Start-up	2	5	3	6	1	5	1		12	1				1	2
4.2 General training and education facilities (employees, entrepreneurs etc.)	2	4	1	5	2	1	1	1	14	1	3	1	3	3	
4.3 Growth and development		14		15	2		1		17	1	1	1	2	3	1
4.4 Conversion courses							1		1					1	2
4.5 Targeted training (women entrepreneurs, ethnic minorities etc.)	2	1	1	5	1		2		4		2	1		1	1
5. Finance	53	27	6	12	14	7	12	31	7	11	11	42	59	10	12
5.1 Equity finance	7	12	8	4	10	32	2	4	2	4	10	4	3	4	14
5.2 Loans	14	10	9	8	14	50	1	2	34	5	19	2	30	7	14
5.3 Guarantees	10	4	8	2	8	12	2		6	6	8	1	4	3	2
5.3.1 Direct guarantees		1		1					12		1				1
5.3.2 Mutual guarantees		1		1	3	1			2	1	2		1		
5.4 Grants & Subsidies	45	37	29	18	32	85	23	7	51	7	35	4	89	23	52
5.5 Tax incentives		8			12	1	4		3	2	7	2	8		1
6. Premises & Environment	1	1	1	21	4	1	1	6	2	1	2	8	1	3	1
6.1 Incubation units	2	1	1	4	2	2	3	2	2	1	2	2	2	1	3
6.2 Business units/factory space				2			1		8			1		1	1
6.3 Location support				1					5			1		1	1
7. Strategic services	4	5	6	5	5	4	6		2	3	4	5	2	6	12
Total	228	195	144	270	218	270	131	113	391	109	169	122	278	141	24

Source Data: European Commission Enterprise Support Measures Database

As may be observed from the table (above), Reception, Facilities, Basic Information, referrals account for 8.78% of all support measures, Professional Information Service 9.31%, Advice and Direct support 21.46%, Training and Education 10.17%, Finance 44.45% (Business Grants account for 17.79%), Premises & Environment 3.54%, and Strategic services 2.29%. Interestingly, despite the profile now accorded business incubation, incubation units (premises) account for only 0.99%. This figure should not, however, be taken as representative of Europe's interest and investment in incubators/incubation for, as

below, incubation is much more than 'bricks and mortar' and incorporates many of the other measures listed above as part of the incubator/incubation model.

3.8 Business Incubation

Business incubators continue to attract attention from policy makers, academics, economists, public and private sector donors and sponsors and international organizations. "According to some as yet unpublished statistics from the National Association of Business Incubators - based in the United States--there are now between 3,500 and 4,500 business incubators worldwide, although the precise number is difficult to pin down. Of these, more than 900 are said to be located in the United States; China has another 460 or so; Germany has 385 incubators; France has over 200; Great Britain has about 160; Japan has a little over 200, and Australia has around 110. From the Arctic Circle to South Africa and Singapore - universities, governments and corporations are using incubators to accomplish a range of wealth creation and social goals. In China, East Germany and the Ukraine, for example, incubators have been used to facilitate the transition to a market economy. In Israel, they have played a key role in helping to integrate immigrants from Russia and the ex-Soviet bloc into the mainstream economy. And in Canada and the United States both large corporations and angel investors have used incubators to accelerate the growth of new companies emerging from the explosion in the high tech sector particularly ICT and biotech in the late 90's" (Carty, 2003, p.3).

As noted in chapter 2, in the developed world and in developing countries and countries in transition, as noted above, SMEs constitute the dominant economic actor (in demographic terms) and are held to make a significant contribution to Gross Domestic Product, job creation, innovation, and competitiveness. From political, economic and social perspectives, SMEs are also regarded as engines of economic growth and activity that can reduce regional disparities (social and economic). Consequently, industrial, regional and economic development policies look set to continue to foster the growth and development of business incubators across the globe.

3.9 Business Incubation and Business Incubators: Scope

There are a range of definitions that reflect significant variations in the nature, level, aims and objectives, roles and mandates of an 'incubator' (as they have evolved with the term) and with significant differentiation of the form (see Figure 1) which illustrate the level of definitional and conceptual heterogeneity that pervades both the literature and the nature and organization of the industry. Indeed, as noted by Wilcock (1999) "distinctions are blurred; the wide variety of operating environments and objectives makes categorisation difficult" In fact, it might be said that the proliferation of incubators is equalled only by the number of definitions advanced by both the practitioner and academic community to explain the phenomenon, for example, the UKBI Incubation Impact Assessment Study 1999/2000 cites 22 definitions (pp. 113-116).

In general terms, incubators are established to address inherent market failures such as an inequitable access to information and capital as well as a lack of focused business advice for new small businesses (Campbell, 1989, pp.56-59). Incubators have also been described by Smilor & Gill (1986, p.191) as holding "the possibility of linking talent, technology, capital and know-how to leverage entrepreneurial talent to accelerate the development of new technology-based firms, and speed the commercialisation of technology" while Falkeström et al (2000) define it simply as "a place where newly created firms are concentrated in a limited space"[13] and Petree *et al.*, (1997, p.3) as "providing favourable controlled conditions to aid in the growth of new ventures".

At the 1998 European Commission Best Practices in Incubator Infrastructure and Innovation Support workshop in Helsinki, a business incubator was defined as: 'A place where newly created firms are concentrated in a limited space. Its aim is to improve the chance of growth and rate of survival of these firms by providing them with a modular building with common facilities (telefax, computing facilities, etc.) as well as with managerial support and back-up services. The main emphasis is on local development and job creation. The technology

[13] European Commission OJ C186 – 51/52dd.27 July 1990

orientation is often marginal'. As noted in the European Commission Enterprise Directorate General's Final Report 'Benchmarking of Business Incubators' Centre for Strategy & Evaluation Services (2002 – page 5), this definition, with the advent of 'virtual incubators (see below) arguably places too much emphasis on the physical aspects of incubator operations.

In the US, in the country that is held to have pioneered incubators, the National Business Incubation Association (2001, page 22) defines an incubator with reference to the business incubation process: "Business incubation is a dynamic process of business enterprise development. Incubators nurture young firms, helping them to survive and grow during the start-up period when they are most vulnerable. Incubators provide hands-on management assistance, access to financing and orchestrated exposure to critical business or technical support services. They also offer entrepreneurial firms shared office services, access to equipment, flexible leases and expandable space — all under one roof".

The Australia and New Zealand Association of Business Incubators (ANZABI), defines business incubation as follows "Business incubation involves a unique mix of advice, services and support to help small businesses develop and grow. It takes place in incubators which are infrastructural developments that help businesses to become established and profitable", while United Kingdom Business Incubation defines an incubator (in the UK Incubation Impact Assessment Study 1999/2000, p.45), as comprising:

- A local property-based facility, multi-tenanted and managed
- Shared space and back-office services – reducing tenant administration costs
- On-site, in house business development services and indirect access to management, resources, networks and transfer of knowledge/skills – building tenant expertise and credibility
- A strong selection policy
- Young, small firms as tenants
- The reduction of initialising costs – reducing financial risk for start-up firms

- A supportive environment
- The aim of improving tenant survival and growth in formative years

More recently, in 2004, UKBI has defined an incubator as "a unique and highly flexible combination of business development processes, infrastructure and people, designed to nurture and grow new and small businesses by supporting them through the early stages of development and change" (p.1). While the provision of physical space for start-ups is evidently a defining characteristic of an incubator the definition used by ELAN in France (as noted in the European Commission Enterprise Directorate-General's 'Benchmarking of Business Incubators' Report (Section 2, page 5)) does not stipulate or define an incubator with reference to physical attributes and instead bases its definition on the objectives of promoting new start-ups and helping existing firms to expand.

More recently, business incubation is increasingly presented as a process that explains what occurs within an incubator and wherein equal emphasis is placed on other aspects including entrepreneur training, mentoring and visibility. For example, as defined by European Commission Enterprise Directorate-General in Benchmarking of Business Incubators (2002, p.17):

> "Business Incubation is a dynamic business development process. It is a term which covers a wide variety of processes which help to reduce the failure rate of early stage companies and speed the growth of companies which have the potential to become substantial generators of employment and wealth. A business incubator is usually a property with small work units which provide an instructive and supportive environment to entrepreneurs at start-up and during the early stages of businesses. Incubators provide three main ingredients for growing successful businesses - an entrepreneurial and learning environment, ready access to mentors and investors, visibility in the marketplace".

Most notably, while NBIA has previously acknowledged that the business incubator is an economic development tool, the EU Commission definition which

is more specific and highlights the specific role incubators in supporting employment and wealth creation. The role of incubators, over and above supporting the development of enterprise, is also developed by the Science Park and Innovation Centre Expert Group (SPICE)[14], which defines a business incubator as follows: A Business Incubator/Innovation Centre Offers rooms for lease, start-up consulting and business planning as well as shared office services to (technology based) innovation companies and entrepreneurs. Such a centre aims at promoting local and regional economic development, the transfer of technology and innovation as well as the creation of jobs. There are different types of incubators, the most typical being:

- Mixed use incubators promoting economic development and growth through enterprise development and offering services to all kinds of enterprise (low-tech, no-tech, light manufacturing, services);
- Economic development incubators focused on specific targets, such as job creation or industrial restructuring. These institutions are often policy driven and heavily managed under local or regional Governments; and
- Technology incubators promote technology-based (start-up) companies with a particular view to the transfer and diffusion of technologies. These are often linked to universities, research institutes and or science and technology parks and, thus, focus on specific industrial clusters and technologies.

Again, the SPICE definition considers physical attributes (accommodation) but not only articulates the provision of services to business but also includes, as an integral element, broader goals and economic development objectives which are being extended ever further to include for example education and social enterprise (see, for example, BIC case studies in Chapter 4). The SPICE definition (above) also alludes to a typology of incubators and it is evident from a review of the literature that there have been numerous contributions to the development/efforts to develop incubator taxonomies.

---

[14] A global network of experts in business incubation, innovation centres, technology parks, regional economic development, technology transfer and entrepreneurship from national and international associations of business incubators and technology/science parks in 25 countries.

There is, however, a discernible 'reservation' amongst incubator managers as regards the field of endeavour that is incubator/incubation research; aggregating 'incubator' activities, (largely to generalise and build incubator/incubation typologies) and establish 'benchmarks' (the real utility of which seems to be in doubt), and the end to which this research might ultimately be put i.e. 'superimposed' over the workings of their facilities somewhat artificially/simplistically and potentially reducing the scope of 'incubator' operations or rather the understanding thereof. The classification of business support facilities as incubators or otherwise by third parties is often inconsistent with the modus operandi of many of these business support facilities as originally conceived and which were, it is often pointed out, conceived well in advance of the development of this 'science/field of research'.

Notwithstanding the above, from a review of the literature (largely academic) incubator taxonomies have been drawn with reference to:

(a) The technology orientation and the level of management support provided:

Figure 3.4: Incubator Typology drawn with reference to Level of Management Support and Technology Orientation

		Technology-orientation[15]		
		Low	**Medium**	**High**
Management Support	**Low**	Industrial Estate	Business Park	Science Park
	Medium	Managed Workshop	Entreprise Centre	Innovation Centre
	High	Business Incubator	**EU 'BIC'**	Technology Centre

Source: European Commission Enterprise Directorate-General Benchmarking of Business Incubators Final Report (2002), page 6

[15] Industrial estates in the top left-hand corner generally have a non-selective intake, provide little or no management support and have no special criteria with regard to business activities and technology content. At the opposite extreme, in the bottom right-hand corner, technology centres have highly selective admission criteria, provide 'hands-on' management support, and have a highly specialised technology focus

(b) Their focus or target clientele (Plosila and Allen, 1985);

(c) The nature and level of sponsorship - public, private, university, non-profit, or hybrid (Nyrop, 1986; Allen and McCluskey, 1990);

(d) With reference to the relative state of development or maturity of the incubated firms (Allen, 1988);

(e) Primary financial sponsorship (Kuratko and LaFollette, 1987; Smilor, 1987; Temali and Campbell, 1984);

(f) Whether incubatees are spin-offs or start-ups (Plosila and Allen, 1985);

(g) The business focus of the incubatees e.g. product development, manufacturing, mixed use (Plosila and Allen, 1985; Sherman, 1999);

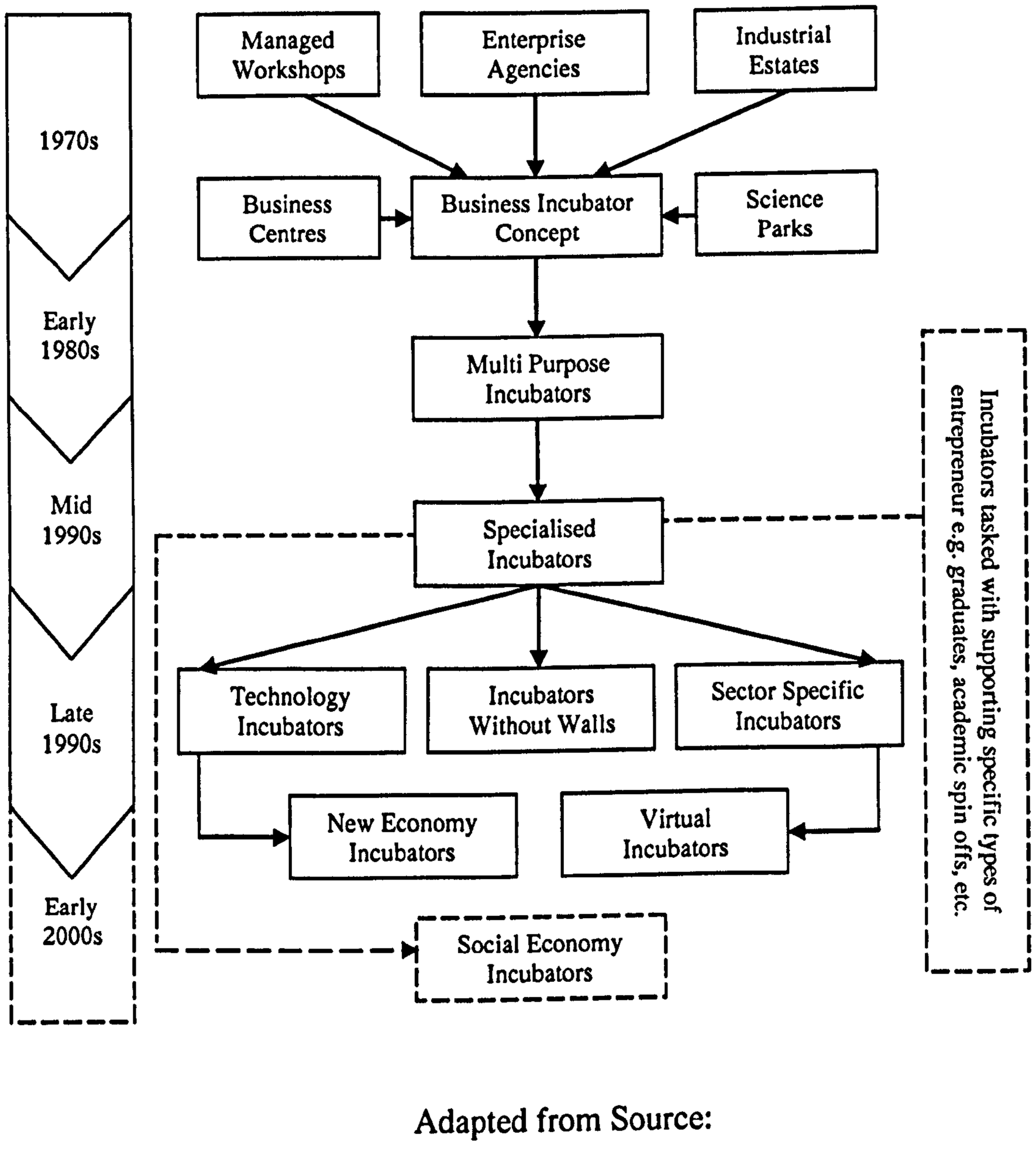
(h) The business focus of the incubator (i.e. property development or business assistance - Brooks, 1986);

(i) Organisational patterns (United Nations, 2001) e.g. 'A non-profit business incubator running with the help of a community or an economic development foundation'; 'A non-profit business incubator running with the help of a community or an economic development foundation'; 'A private or for-profit incubator usually owned by venture and seed capital investment groups or real estate development partnerships'; 'A joint effort of the local and central Government, a non-profit private organization [A partnership allows the incubator to take advantage of both the expertise of the private sector and the use of public funding]; 'An affiliation of a university [The purpose of such a business incubator is to help in the development and transfer of new technology];

(j) The practices of incubation and the evolution of the incubator model. Lalkaka (2001) refers to a *'first generation'* of incubators (established in the 1980s) generally offering affordable space and shared facilities to carefully selected entrepreneurial groups which in the 1990s added supplementary services such as counselling, skills enhancement and networking services to access professional support and seed capital, for tenants within the facility and affiliates outside. In addition, he identifies a 'second generation' emerging in 1998 concerned with mobilising ICT and providing a convergence of support, towards creating growth-potential, tech-based ventures and a 'third' which brings together support services for knowledge based businesses with linkages to HEIs, research centres,

venture capitalists and international joint ventures"(Lalkaka, 1997). The evolution of the incubator model is also explored in the European Commission's Benchmarking Business Incubators Report (see below and adapted) to acknowledge the development of incubators concerned with the social economy and specific types of entrepreneur):

Figure 3.5: Evolution of Incubation Model(s)



Adapted from Source:

European Commission Directorate General Enterprise (2002)

Benchmarking Business Incubators Final Report, Section 2, p.3

In practice, many of the incubators examined in the course of this research, particularly BICs (see also case studies below) are operating as technology incubators AND are practising sector specific incubation AND incubation with and without walls AND New economy incubation AND social economy incubation AND incubation targeting specific types of entrepreneur (e.g. graduates, academic spin-offs, entrepreneurs from black and other ethnic minority groups) all as part of the same incubator model (particularly BICs - see case studies).

Further, while a number of contributors to the field have noted the provision of services outwith the incubator as a new or emergent phenomenon - e.g. Rice and Matthews (1995), and Lalkaka (1997) who refers to a 'second generation' of incubators serving businesses within walls and on an outreach basis - discussions and interviews with incubator managers and personnel undertaken in the course of this research suggest that this facet of incubator operations was evidently, more often than not, part of their original 'first generation' incubator model. A number did however acknowledge, that this feature of incubator operations owed much to the speed at which the incubator 'matured' over and above an immediate concern to achieve optimum occupancy levels (and break even), the entrepreneurial flair of the incubator managers and staff who realised that the incubator could and should be capable of much more (and frequently in advance of their sponsors and stakeholders) and that in any event, incubation and/or high value added business support of the kind which they were equipped and staffed to deliver (off-site) was an important activity in its own right in strategic and/or political terms (demonstrating additional value for money to initial sponsors) and in financial terms (as potentially a source of commercial revenue that might be exploited once the incubator had established its reputation and credibility with the local business community and other agencies outwith the incubator's walls).

As regards new economy incubators, the dot.com boom circa 2000 prompted the development of a great many Internet/ICT business focused incubators, especially in the USA and, to a more limited degree, in Europe. The Harvard Business School survey in 2000 identified 356 such incubators around the world. Of these 222 were found to be in the US (about 25 % of the total U.S. incubator stock), while others were found in Canada (14), UK (28), China-Hong Kong (11), and Brazil (10) – Hansen et al, 2000.

As noted in the European Commission's Benchmarking Business Incubators Report (2002, p.8)"in 1994, only 1 out of every 25 technology incubator companies was IT related, by 1999, this figure had risen to 20". Sponsors include the quoted arms of established consultancies and technology solutions providers such as Bain & Co., Ernst & Young, HP and Dell and IBM; telecommunications companies such as Sprint PCS; and dot com start ups such as cocoon, Gorilla Park, Ant Factory, Cartezia, and Internet-Incubation".

Doubts have however been expressed as regards the veracity of the European Commission's figures from within the incubator community in the course of this research vis-à-vis the assertion that by 1999, 20 of all 25 businesses incubated were IT related. It has been suggested that this may overstate or misrepresent the profile of businesses assisted i.e. the phrase IT-related is rather 'loose' and while it seemingly implies that 80% of businesses assisted were IT businesses, it would perhaps be more true to say that 80% of businesses assisted received assistance with the application of ICT in their business.

Notwithstanding, these semantics (which are nonetheless important) as reported by Lalkaka (2003, p.7):

> "In the 1999-2000 period, some 400 for-profit, Internet incubators were added in the US and elsewhere, due to expanding opportunities that the Internet seemed to offer and due in part to unrealistic expectations. Typically, this model provides a smart workspace, focussed consulting services to a small growth-potential group of firms, takes equity in the companies through an affiliated venture capital facility, and accelerates them to the market. The bulk of these incubators – once considered the paradigm of best practice – have closed down. Nevertheless, the equity-based, net-worked model has taught some lessons and continues to have relevance".

In the course of interviews conducted as part of this research, however, it has been suggested that in the UK at least, the adoption of the 'new economy incubator model' (or derivatives thereof) may account for a number of incubator casualties, most notably London BIC (now in the hands of administrators) which reportedly deferred income from tenants and start-ups (i.e. rent) in return for equity and, in so doing, fell prey to a general misconception as to the commercial potential or more specifically the rate of return (and time for return) on 'new economy businesses' and moreover the rate of return/return on investment (outwith basic service charges/tenant rents) for most start-ups facilitated by incubators.

For example, it is to be remembered that many of those incubators that have 'bought into' the 'new economy model' or otherwise provide or exchange support, services, accommodation and facilities in return for equity in the assisted/incubated businesses do so at a point in the development or life of the business where the market i.e. venture capitalists have generally elected not to intervene or invest their time (expertise) or money as the risk is calculated as being to high or the rate of return relative to their investment not sufficiently rewarding or timely so

as to render the activity as not commercially viable. A sense of commercial reality was seemingly suspended by a number of incubator operators swept up in a wave of optimism as to the commercial potential of 'dot.com' businesses, reinforced by political and economic development priorities for the same.

In the North East funding was evidently made available to establish a new model economy incubator at the North East of England Business and Innovation Centre (NEBIC). While not sharing the funding agencies optimism re the commercial prospects (and then regional endowments) of potential new economy businesses, NEBIC nevertheless accepted funds to establish a facility specifically for ICT businesses. What is clear however, is that NEBIC remained consistent in its approach and unlike many refused to suspend, neglect or 'water-down' the normal rules of business/business incubation i.e. NEBIC recognised that a "business is a business" regardless of whether it be a 'traditional' or 'new' economy business and that it must, like all businesses, generate a return to pay the bills (and regardless of the prevailing "hype", "expectation", "fad", "fashion" or "misplaced enthusiasm" and/or "confidence of economic development strategists and funding agencies (no matter how well intentioned) and experienced institutional investors alike"!.

Another explanation advanced in the course of this research for the failure of so may 'new economy' incubators has been the nature of the intervention of strategic and/or funding agencies which tasked or incentivised so many of these failed incubators to support 'new economy' businesses and adopt 'new economy' incubator models without fully understanding the real potential of indigenous regional endowments, the incubation process, the sustainability of 'new economy incubator models', the new challenges presented by the incubation of new economy businesses and the new approaches required to incubate them to say nothing of the rate of return in 'new economy' ventures.

It has also possible that first and second generation incubator managers were more readily able to largely dismiss, as a case of the 'emperors new clothes', the hype that surrounded 'new economy' incubators/incubation (i.e. to a large extent their incubator operations were relatively mature (and their business model settled) and thus the funding made available for 'new-economy' incubation was accepted only as an extension of their existing model and not something that overly skewed or re-defined their business model).

In addition, it may be that a lack of experience, expertise and general savvy i.e. naivety amongst third generation incubator managers may also explain, in part, so many of the incubator failures around this time. For example first and second generation incubator managers may have been more able to influence funding agencies and challenge them (albeit discreetly and at a personal and institutional level) as necessary i.e. where for example regional strategies and plans may be/were ultimately flawed as unworkable - a factor often of their personal networks, expertise and experience and their 'institutional presence' within for example the regional incubation/innovation system.

Further it has also been suggested that stakeholder/sponsor expectations and pressure on the 'third generation' incubators to achieve (in essence a host of 'undeliverables') prompted something akin to 'land-grab effect' where incubators in an effort to achieve targets were prepared/compelled to incubate sub-standard ideas as the only means of demonstrating activity and their endeavour. Naturally, the coupling of the new incubator model (wherein incubators accepted equity instead of rent) with sub-standard, non-commercial/less than optimum commercial propositions to say nothing of the inevitable market correction and revaluation of such businesses was inherently doomed.

(k) The relationship between sponsorship and motivation (Allen and McCluskey, 1990, p.64 - see table 3.3 below).

Table 3.3: Incubator Value-Added Continuum

	Real Estate	*Value-Added Through*		*Business Development*
	For-Profit Property Development Incubators	**Non-Profit Development Corporation Incubators**	**Academic Incubators**	**Business Development For-Profit Seed Capital Incubators**
Primary Objective	Real estate appreciation	Job Creation	Faculty-industry Collaboration	Capitalize Investment Opportunity
	Sell proprietary services to tenant	Positive statement of entrepreneurial potential	Commercialise University Research	
Secondary Objective	Create opportunity for technology transfer	Generate sustainable income from the organization	Strengthen Service and Instructional Mission	Product Development
	Create Investment Opportunity	Diversify Economic Base	Capitalise Investment Opportunity	
		Bolster Tax Base		
		Complement existing programmes	Create good will between institution and community	
		Utilise vacant Facilities		
Stakeholders	Property Developers Economic Development Officials	Economic Development Officials Politicians	University Officials Economic Development Officials Politicians	Managing Partners Limited Partners Economic Development Officials
Admission Policy	Ability to pay rent	Net jobs potential New firms Local ownership Not retail, wholesale of personal services	University Affiliation Technology Intensive Net jobs Potential Complements University Programmes	High Growth Potential
Exit policy	None	Graduated rent Time limit None	Graduated rent Time limit None	Growth Performance

It is postulated that incubators at the right side of the matrix are more likely to add economic value to the local economy (because they emphasise business development) than incubators on the left side of the continuum.

However, it also became evident in the course of interview undertaken with incubator managers that an incubator's orientation as understood within and outwith the incubator (e.g. amongst incubator sponsors and stakeholders) may give rise to tensions and potentially significant disputes. For example, whereas an incubator might be initiated by the estates/property development arm of e.g. a local authority or indeed a university which may regard the investment in an incubator as a 'real estate' investment which should ultimately yield a return (i.e. the revenue derived from tenant rents) they are invariably staffed by members of the organisation's economic development, regeneration or business support staff who are naturally disposed to seek to develop the portfolio of services and extend the nature and level at which they can add value to assisted businesses (i.e. reinvesting the revenue derived from tenant rents in e.g. new equipment, facilities, programmes, etc thus significantly reducing the rate of return).

Consequently, these tensions which can erupt within separate divisions of a local authority are often the catalyst that compels authorities (often in the absence of a formal policy) to decide policy at an executive level i.e. is the business incubator portfolio tasked simply with generating a financial return to the estates department(via tenant rents) or with providing incubator services with the concomitant impact on the immediate financial return to the authority (notwithstanding the other socio-economic returns generated by the latter) or both?

In any event, it has been suggested in the course of this research (and more than once), that academic and practitioner interest in the concept of and evolution of incubators as a species of business support and the field of endeavour concerned with defining and categorising what is and is not the business of an incubator ('incubation') has a lot to answer for insofar as it may have skewed the focus (and understanding) of economic development strategies, actions and policy instruments (and efforts to support enterprise/entrepreneurship) the world over!

For example, it has been observed that while incubators are generally perceived and considered to be concerned with the provision of services to start-ups/new businesses (as illustrated by the definitions of business incubators above (academic, practitioner and stakeholder and including, for example, the European Commission), it has been suggested that those who have sought/now seek to categorise or define what they understand and think the business of incubators to be about/should be about are to an extent, divorced from the reality.

3.10 Incubator Focus

There is, for example, a presumption in policy - instruments and funding regimes - particularly European and specifically UK, and the literature (academic and practitioner as researched in this study - see for example, Lalkaka, 2003) that a business support facility presenting itself as an incubator/concerned with incubation is confined/should confine itself to new businesses (a term which is itself ill-defined within and outwith the incubator community and is, at best arbitrary, and can be found to mean for example, a business pre-start, a business less than 12 months, 3 years and 5 years old).

Not surprisingly, it has been suggested, however, that this is far from the norm and that there is world of difference in 'what is' and (arguably) 'what should be' and indeed whether a number of representations as to what is 'best practice' are correct. In reviewing whether this focus for incubator operations is to be found in practice and having examined business incubator admission criteria amongst a sample of incubators operating in the East Midlands (telephone interviews conducted with incubator managers on 28.04.05), it may be observed that 13 of 31 in the sample (see table below) do not in fact operate admission criteria, while those that do so, do not necessarily confine themselves to new businesses or business start-ups howsoever they are defined.

Table 3.4: Sample East Midlands Incubators & Operation of Entry Policies[16]

Facility		Entry policy
1.	The Bearings	No
2.	Boughton Pumping Station	No
3.	Chadburn House	No
4.	Coney Green Business Centre	No
5.	Dunston Innovation centre	Yes
6.	Edwinstowe House	No
7.	Mansfield Business centre	No
8.	Mansfield I centre	Yes
9.	Markham Environmental Technology Centre	Yes
10.	Pleasley Vale Business Park	No
11.	Ransonwood Business Park	No
12.	E- Centre, Sherwood Energy Village	Yes
13.	Tapton Innovation Centre	Yes
14.	Westthorpe Innovation Centre	Yes
15.	Turbine	Yes
16.	Bio City	Yes
17.	Blue Coat Incubation Centre NBV	Yes
18.	Broadway Media Centre	Yes
19.	Castle Cavendish	Yes
20.	Nottingham Fashion Centre	No
21.	The Hive	Yes
22.	Innovate Office	No
23.	Lenton Business Centre	No
24.	Mercury House	Yes
25.	Nottinghamshire International Clothing Centre	Yes
26.	UNIEI Lab	Yes
27.	New Brook House	Yes
28.	Nottingham Science and Technology Park	Yes
29.	S.G.C.S. Business Park	No
30.	Southglade Food and Drink Park	Yes
31.	Strelley Hall Business Centre	No

[16] Source: Alliance SSP Strategic Partnership and independently confirmed by telephone interviews conducted with incubator managers and staff on 28.04.05

It has been indicated in the course of this research that the focus of those business support facilities that are described and/or presenting themselves as 'incubators' are, in fact, rarely concerned with providing support for 'new' businesses to the exclusion of existing and established businesses.

For example, in the course of research conducted at NEBIC (desk research and interviews conducted with incubator managers and staff - past and present), it is clear that the general interest of the original NEBIC scheme (and most 'first generation' incubators), as originally conceived was to extend the array of business support in the locality and as *part* of this approach offer new/alternative premises within a supportive environment to indigenous businesses, business starts and other businesses that might be persuaded to locate to the facility from outwith the locality and region - "Support for start-ups and existing businesses was not perceived as mutually exclusive". This is reflected in the profile of businesses assisted by NEBIC in 2004 wherein BIC supported approximately 300 business start-ups (90% of which were individual entrepreneurs, 5% industrial spin-offs/hive-offs and 5% academic spin-offs), the BIC also supported 500+ existing SMEs to say nothing of the 160 businesses already resident on site. In addition, in 2004, NEBIC organised 50 Training events attended by 500+ would be entrepreneurs and 20 training events for existing businesses attended by more than 200 people. Moreover, of the businesses located at the North East Business and Innovation Centre, one of the tenant companies interviewed was founded in 1964 and others in 1970, 1971, 5 in the 1980s, and five in the 1990s.

It is evident that within the incubator community there is a feeling that an ill-conceived policy/funding thrust concerned with increasing business birth rates may be responsible for introducing an unwelcome pre-condition for support (as might be provided to a business by an incubator) i.e. that supported or incubated businesses be 'new'. The policy thrust that accords the promotion of new or micro businesses as a priority may be traced to a range of empirical investigations which include, for example:

- Ashcroft and Love (1995) and (1996) who, found that regions with higher business birth rates have experienced higher levels of job growth;

- Reynolds (1999) who has observed that entrepreneurship [in the USA] is positively related to growth;
- Thurik (1999) provided empirical evidence from a cross-sectional study from 1984 to 1994 of the 23 countries that are part of the Organization for Economic Cooperation and Development (OECD), that increased entrepreneurship, as measured by business ownership rates, was associated with higher rates of employment growth at the country level;
- Reynolds et al. 2000 in the Global Entrepreneurship Monitor (GEM) Study wherein an empirical link between the degree of entrepreneurial activity and economic growth, as measured by employment, at the country level was observed;
- Foelster (2000) examines data for Sweden between 1976 and 1995 identified a link between micro behaviour and macroeconomic performance, and observed that increases in self-employment as a share of total employment had a positive impact on regional employment rates in Sweden;
- Callejon and Segarra (2000) analysing data for Spanish manufacturing industries (1980-1992) found find that both new firm start-up rates and exit rates contribute positively to the growth of total factor productivity in regions as well as industries;
- Audretsch and Fritsch (2002) who concluded (analysing data for the 1990s) that regions with a higher start-up rate exhibit higher growth rates
- Similarly, Carree and Thurik (1999) and Audretsch et al. (2002) Audretsch and Thurik (2002) find that OECD countries exhibiting higher increases in entrepreneurship have also experienced greater rates of growth and lower levels of unemployment.

However, the policy concern for new firm formation not sit particularly well throughout the academic community (e.g. Storey, 1993), nor does the justification for targeting certain types of business (Storey and Johnson, 1987; Johnson and Smallbone, 2003; Atherton and Lyon, 2001); characteristics of the business owner (Johnson and Smallbone, 2003) or even the spatial dimension of SME policy (North et al, 2003; Porter, 1995). This accords with concerns of practitioners interviewed in the course of this research who have expressed the

view that the promotion of support for business start-up over and above support for existing businesses may be ill-conceived; and that despite popular misconceptions to the contrary, many of today's incubators were in fact originally conceived as facilities for the provision of an integrated package of services (and accommodation) for new business and existing businesses (e.g. technology businesses and/or simply businesses with 'growth potential').

It is evident from discussions with incubator management and staff and observation of incubator operations (at for example, North East Business and Innovation Centre (Sunderland), Entrust (Newcastle), ATMEL/Cenamps (Newcastle), The Digital Factory (Newton Aycliffe), Loughborough Innovation Centre, DeMontfort Innovation Centre, UNIEI (Nottingham) BioCity (Nottingham), The Hive (Nottingham), Mansfield I-Centre, Midlands Innovation Relay Centre (Coventry) to mention but a few) that the desire to facilitate business start-ups (on the basis of their capacity to generate or support employment and economic growth - which no doubt underpins much of the public funding channelled into business incubation programmes and incubators) is but a part of incubator operations and omits consideration of the degree and extent to which value is being added [by incubators] to existing SMEs vis-à-vis their growth, sustainability and ability to generate employment[17].

Incubator managers and staff interviewed in the course of this research have emphasised that the provision of services and/or accommodation to 'new' businesses is but one facet of their operation (see services and case studies below) and that the word 'incubator' as understood conceptually and applied as a descriptor of their operations has been allowed, unduly, to define or characterize the nature and level of the whole organisation as concerned with support for new businesses and erroneously omits consideration and representation of a myriad of

[17] Other criticisms of incubator funding agencies have included (in the UK) the organisation or operation of European Regional Development Funds (specifically Objective 2 funding) which prescribes that businesses assisted with ERDF should receive substantive assistance amounting to five days support. This apparently arbitrary stipulation, seemingly unique within Europe to the UK, has seemingly forced incubators to develop supply-led programmes and interventions to accompany demand led interventions i.e. incubators may find themselves in situations where they are unable to deliver assistance as required by businesses unless the business accepts additional (and perhaps unwanted or unnecessary assistance) so that the incubator is able to draw down European funding to deliver the support.

other services (e.g. provided to existing businesses) i.e. support for new firms is one of the things such facilities provide but is not necessarily that by which they would wish to be/should be defined (see incubator rationales and services below).

Indeed, in practice it seems that the measure of 'newness' as applied by incubators is seemingly arbitrary or remains (deliberately) ill-defined so as to be not unduly prescriptive. Further it has been suggested that incubator models focussed exclusively at supporting new businesses may be fundamentally flawed as being unsustainable without significant subsidy insofar as the rental income (and the level at which this is may be charged to start-up businesses) is unlikely - of itself - to support the delivery and development of substantive incubator services over and above limited firm-level benefits to the tenants (i.e. incubator operations and services are not merely a factor of the aims and objectives of the incubator but also the level of financial return that can be generated from tenants and assisted businesses).

Furthermore, and pursuant to the entry policies explored above, and notwithstanding the suggestion that business incubation should be concerned with new businesses, it is suggested in the incubator literature (generated within and outwith the incubator community) that incubators should operate selection policies i.e. apply admission/entry criteria and focus or select where they add value. In the UK, according to UKBI's National Business Incubation Framework (2004, p.4) while it is acknowledged therein that incubator clients should be appropriate to the "objectives of the incubation environment and its stakeholders" and that "the selection policy will differ from one incubation environment to another, depending on the mission statement and overall objectives [it is assumed that most clients admitted to incubation environments] should be admitted on the basis that they demonstrate the following characteristics:

- Exhibit potential for growth;
- Meet specified targets;
- Be able to put forward a business idea/plan;
- Be willing to accept and act upon the advice/mentoring provided; and

- Have (or be able to develop) the capacity to pay for the facilities and services".

In any event, and in consideration of the incubator operations visited in the course of this research and discussions with incubator managers, it is submitted however that such 'entry criteria' are generally less than exacting and that they often appear little more than a nod to the notion that an incubator should be selective as regards who they elect to support. Naturally incubators look to provide accommodation and services to viable propositions with the potential for growth not least because of the revenue an incubator hopes to secure vis-à-vis rents and from the provision of other services (whether they be subsidised or provided at commercial rates). Further, the notion of a 'capacity to pay' is in any event generally imperative for incubator management insofar as they are largely dependent on the revenue from tenants (unless wholly subsidised and that the future of the subsidy is secure) to support the bulk of all incubator operations including personnel costs i.e. their own jobs; i.e. patronage may be temporary and outwith an incubators control whereas income from tenants is something over which they have and can exercise direct control.

As regards those incubators that do present themselves as prima facie concerned with supporting for example only 'innovative' businesses or for example specific technologies and as having a more rigorous or selective criteria for admission over and above basic commercial viability, they too are nevertheless largely subject to an overriding financial imperative. It has been suggested that unless an incubator is financially secure and has established revenue streams from e.g. anchor tenants, incubated and 'grown' businesses and other off-site activities such as public commissions/service contracts and consultancy (or unless heavily subsidised) it must favour businesses with a capacity to pay as opposed to perhaps those businesses or innovators developing/hoping to commercialise, for example, blue sky research (in a particular technology) as the return may be so far removed from the present and/or the technology so insufficiently mature to support the generation of revenues. In other words, incubators are often forced 'pass' on radically innovative propositions or technologies in favour of perhaps a 'less

exciting' or less radically innovative businesses which have the capacity to pay their incubator bills.

Indeed, herein lies one of the dichotomies observed in the course of this research, as while incubators are often understood to be concerned with innovatory high-technology businesses and are often perceived and/or presented by stakeholders as there to offer specialist support to innovating high-technology companies, the importance of the technology or 'radicalness' or 'novelty' of the innovation is often overplayed and it would be more true to say that they are in fact concerned with supporting commercially viable propositions (high-tech or otherwise) i.e. the commercial viability of tenants and businesses assisted is key to the viability of the incubator and more so than the degree of innovation present in the business. Of the multiple incubators visited in the course of this research, they have been found to be incubating or providing homes for high-tech and low-tech businesses in a myriad of technologies to social enterprises, charities, and other business support organisations including 'virtual incubators' and 'virtual technology incubators' (e.g. CENAMPs).

This undeniable financial imperative may in fact explain the nature of incubator entry criteria being espoused by incubator associations i.e. that the 'selection' of tenants is based on their commercial viability without necessarily prescribing degrees of innovation or the nature and level of growth that an incubated firm must achieve (over and above that required to pay their rent/for services). Indeed, as may be observed from the UKBI criteria (above) the fact that an incubated business be 'new' is not in fact a stipulation.

3.11 The Development of Business Incubation

However, before proceeding to a more detailed exposition of the role, function and added value or impact of incubators (specifically BICs), the way in which the modality has evolved and achieved a currency in economic development circles merits attention. The origins of business incubation modality can be traced back to Western industrialised countries in the late 1970s and early 1980s. The period may be characterized as one of increased unemployment prompted by the

collapse of many traditional industries. In both Europe and the USA, policy makers in response to economic restructuring which had devastated formerly prosperous and industrious communities (in social and economic terms), sought fresh strategies and approaches to support the regeneration of sectors, communities and indeed whole regions. The collapse of so many industries and industrial giants compounded the erosion of neo-classical economic theory (and policy approaches rooted therein).

The emergence of new approaches, prompted by a new focus upon the potential of enterprise, innovation and new firm formation to produce endogenous growth (Eisinger, 1988; Massey et al., 1992; Atkinson, 1991) characterised much of the policies and politics of the 1980s (in the UK and the USA). This major shift in public policy focus, during the early 1980s, towards the promotion and development of new small firms as *the* vehicle for job creation, which it is largely acknowledged was reinforced by Birch's startling results in 1979, ensured that the SME sector would be a key focus for policy makers, politicians and academics.

Evidently, widespread interest in business incubators as an economic development tool began in the early 1980s. According to Weinberg, Lyons, and Shook, (1995) the first incubator programs were established in the United States in Pennsylvania and North Carolina in 1983 and were followed by programmes in other states. Weinberg et al., report that by late 1985, approximately 12 states had incubator programmes by 1989, about half the states had or were developing programs and by 1994, 49 states had operating business incubator programmes. However, commentators have observed a decline in state financial support in relation to the number of incubation programs a fact they attribute to the economic difficulties of the early 1990s and a shift in economic development policy from broad-based programs - such as business incubators - to targeted programs focusing on specific technology and manufacturing needs.

However, the roots of business incubation/incubators might be traced much earlier. Lavrow and Sample (2002) attribute the origins of business incubation some 40 years earlier. They note that Student Agencies Inc., located in Ithaca, New York, was established to incubate student companies in 1942 and that in

1946, Massachusetts Institute of Technology (MIT) president Karl Compton and other alumni founded the American Research Development (ARD) incubator. According to Lavrow and Sample (2002, p.16) the first documented incubator outside of the academic environment was the Batavia Industrial Centre (BIC) located in Batavia, New York. They report: "The building was purchased by a local family business, Charles Mancuso & Son Inc., after Massey Ferguson went bankrupt, leaving approximately 2,000 people out of work. The building covered 850,000 square feet, which was impossible to lease out to a single tenant. It dated back to 1882 and was in need of a new roof and other repairs".

According to Adkins (2001) cited in Hacket and Dilts (2004, p.57), "the developer opted to sublet subdivided partitions of the building to a variety of tenants, some of whom requested advice and/or assistance with raising capital. The business incubator was born". One of the first tenants in the building was a company that incubated chickens. According to McKee (1992, p.41) "People observed the similarity between incubating chickens and incubating companies, and the term stayed with the industry". The BIC is still in operation with 110 tenants employing some 1,000 people. Not all tenants are start-ups; any business can rent space in the building. Over the years, the BIC has incubated more than 1,000 businesses and employed more than 5,000 people through its graduates and tenants (see Burger, 1999, Aragon and Landry, 2000, Adkins, 2001, and Hackett and David, 2004).

Generally, however, incubation programs diffused slowly in the 1960s and 1970s, typically as government-sponsored responses to the need for urban/mid-western economic revitalization; a motivation to find new uses for old, abandoned factory buildings in distressed areas; and on the initiative of a number of entrepreneurs and groups of investors to transfer their venture experiences to new companies in an environment conducive to innovation and commercialization (see also Meeder, 1993). Led largely by universities (Smilor and Gill, 1986) interest in incubators and incubation was stoked significantly in 1963 when 30+ academic and scientific institutions collaborated to establish the University City Science Centre (UCSC), aimed at stimulating and rationalizing the process of commercializing basic research output which was [then] billed as the U.S.'s largest

urban research park (Bowman-Upton et al., 1989; Schierer, 1985). Later, in the 1970s and 1980s, other US communities gripped by the realities of industrial restructuring adopted the incubator modality (Allen and Bazan, 1990).

Evidently, incubator diffusion (illustrated in Figure 1) increased significantly during the 1980s and 1990s reflecting a general shift in resources to support the small business environment. According to NBIA there 20 incubators a year were opening in 1984 which increased to more than 70 per annum in 1987. In addition, other contributions to the development and diffusion of the incubator modality in the US are also said to have included (a) the Bayh-Dole Act in the U.S. Congress in 1980 which significantly reduced the uncertainty associated with commercialisation of federally funded basic research - a significant stimulus for University innovation/incubator centres (Allen and Weinberg, 1988); (b) increased recognition of the importance of innovation and intellectual property rights protection; and (c) increased opportunities to realise returns on investment in the commercialization of biomedical research and (d) interest in incubation from the corporate sector – e.g. the Fairchild Corporation, which between 1957 and 1970 was reportedly directly or indirectly responsible for the start-up of 35 companies including Intel and National Semiconductor (National Council for Urban Economic Development, 1985).

It is, unclear as to when the deployment of business incubators became a programmed policy action as opposed to an organic development in response to local needs and conditions which seemingly evolved through the efforts of local energetic actors/institutions keen to develop new approaches. However, if one moment in the history of the development of incubators were to be highlighted as being significant in the adoption of the incubator modality [in the US] as a national instrument of policy, the National Foundation's (1985) Experimental Research and Development Program (National Science Foundation, 1985) which sought to stimulate and institutionalise best practices in the processes of evaluating and commercializing selected technological inventions (Bowman-Upton et al., 1989; Schierer, 1985) might be selected as the moment when the US Government committed to incubators or 'innovation centres' (piloted in the 1970s and by 1981 had expanded to include a total of eleven centres which served as the basis for

future university efforts in launching innovation/incubator centres (Allen and Weinberg, 1988, p.200). NBIA (2004). also highlights the contribution of the U.S. Small Business Administration (SBA) Pennsylvania Legislature which in 1982 enacted Walter Plosila's design for the state's Ben Franklin Partnership Program, which included incubators as a key component of a technology and manufacturing agenda (which subsequently became an early model for other states' support of business incubation) and Control Data Corporation's City Venture Corporation, which developed business in several large and small cities

However, it should also be acknowledged that the United States economy was, in any event, evolving from a reliance on primarily large manufacturing firms to embrace a base of newer, smaller, technology-driven, service-oriented businesses (and arguably in advance of any other economy in the world) which might, to some extent, account for some of the abandoned factories noted by Meeder (above). Evidently US 'Inc' (i.e. LSEs) confronted by (and at the same time riding) the 'technological revolution' and the increased globalisation of competition of trade, was prompted or rather forced to restructure (and lay off thousands of employees in the process – a factor which would again account (at least in part) for Meeder's defunct factories (see above)). Notwithstanding the restructuring of US LSEs, SMEs were seemingly creating an unequalled number of jobs while new ventures embracing new technologies were 'birthing' in unprecedented numbers. Not surprisingly, these events were not overlooked by local and regional economic development practitioners who were increasingly persuaded that small businesses were becoming a significant factor in:

- job creation (although in reality they were, to some extent, absorbing/countering the effects of LSE restructuring and job destruction (the social, economic and fiscal costs of redundancies); and
- Economic diversity, to say nothing of their potential to expand the tax base).

It is, however, difficult to discern whether the emergence of SMEs was perceived [at the time] as anything more than a 'band-aid' for the consequences of economic restructuring or as a component of a hitherto unappreciated 'knowledge

economy'. In any event, and with or without the benefit of an economic 'crystal ball' it was surely natural (even on the grounds of pure demographics) that economic developers (given the changing demographics of the economic structure) created programs that would support and nurture new venture creators (entrepreneurs) and their start-up companies.

Elsewhere in the world, in the UK for example, incubators or managed workspace as it was then called emerged has been adopted more gradually. The development or introduction of incubation/incubators is generally attributed to British Steel (Industry) Ltd., a subsidiary of British Steel formed in 1975 to create work in steel producing areas that were to suffer significant job losses as a consequence of modernization and privatization. The concept was further developed and deployed as part of system of SME support that has evolved in the UK during the last 30 years which have seen the UK persevere with lower marginal tax rates and the liberalisation and deregulation of labour and capital markets. During this period the UK developed and established approximately 300 enterprise agencies between 1978 and 1986 (some of which prospered while others failed (while the introduction of Business Links also rendered many superfluous and prompted a number to close), 80 training and enterprise councils (TECs) from 1989 to which was added the aforementioned network of Business Links (some training and enterprise councils absorbed their local business link to alleviate the financial difficulties that have seemingly afflicted the latter since their creation while some chambers of commerce merged with their local training and enterprise council and the local Business Links followed them).

Given the number of actors the UK has, unsurprisingly, sought to rationalize the business support infrastructure. The Small Business Service established as an Executive Agency of the Department of Trade and Industry in April 2000 is often the subject of speculation as regards its future i.e. that it might be disbanded (TECs have already been abolished) as may a number of Business Links who have struggled to become self-sustaining. In the UK, Regional Development Agencies, local authorities and universities look set to be tasked with performing a more integral role. It is speculated that a number of Business Links may become increasingly superfluous and that a number of the country's larger

incubators may bid against current Business Link franchisees and subsume these activities.

Elsewhere in Europe, in for example other 'less-favoured regions', incubators emerged as a policy modality in Berlin in 1983 (Berliner Innovation – und Gründerzentrum-BIG), which was established by the Technical University in Berlin with support from the Berlin parliament. Evidently, the example was adopted elsewhere in Germany thereafter and the number of incubators increased significantly throughout Germany following unification as the modality (in the form of technology centres) was deployed to support restructuring and facilitate entrepreneurship and economic development. Incubators were established before unification in Berlin, Leipzig, Frankfurt/Oder, Dresden and it was the federation of west german incubators (Arbeitsgemeinschaft Deutscher Technologiezentren (ADT) which facilitated the deployment of incubators in the east, with west german incubators (e.g. Dortmund, Hannover and Schwerte) partnering their east german counterparts.

In Italy, another of Europe's 'less favoured' regions, SPI – Promozione e Sviluppo Imprenditoriale S.p.A (part of the Institute of Industrial Reconstruction concerned largely with restructuring steel producing regions) has played a significant role in the development and deployment of incubators and has, in particular adopted the EU BIC model (which may account for the prevalence of the large number of BICs in Italy as compared to other regions of the EU) offering managed workspace and business support within and outwith the incubator walls. For example, centres have been established in Trieste (1989) and Genoa (1990), Taranto in Puglia (1992), followed by others in Pozzuoli (Naples) and Marcianise (Caserta). As reported by the OECD (1999, p.73) a second generation of almost exclusively purpose-built centres opened during 1995 and 1996 at Massa in Toscana, Teramo in Abruzzo, Gorizia in Friuli Venezia Giulia, Campobasso in Molise, Catania in Sicily, and Casarano in Puglia's southern province of Lecce and in 1997 at Terni. Further additions to Italy's incubator stock are evidently proposed for Calabria, Taranto, Savona, La Spezia (Liguria), Lovere (Brescia), Piombino, Foligno, Salerno (Campania), Sassari and Nuoro.

3.12 Incubators today

According to (McKinnon and Hayhow 1998), the number of business incubators almost quadrupled between 1986 (140 incubator sites) to 1996 (548) and it is now reported by the NBIA that there are approximately 1,000+ incubators in the US alone (up from only 12 in 1980) and an estimated 3,500-4,500 worldwide (Lalkaka, 2003) an estimate which was recently affirmed by the Global Forum on Business Incubation: Creating Conditions for Innovation (2004) wherein it was stated that "there are nearly 4000 incubators of various types operational in the World". It is reported that Europe now has nearly 1000 incubators including 300 in Germany and 200+ in the UK (but see below). Among the developing countries, China which has shown exponential growth in the incubators and over a period of ten years is reported to have established almost 400+ incubators most of which appear to be linked to universities/HEIs (however as illustrated below, this figure now appears understated). Korea is reported to have around 300 Incubators, Japan 130, and India approximately 80.

Table 3.5: Incubator Distribution Statistics[18]

Country	Number of Incubators*	
USA	1000	Figure is proximate to NBIA figure (Lalkaka, 2001)
Germany	300	
UK	200	UKBI 2005 figure: 220+
Japan	130	AABI figure: 265 as of Nov 2002 (The Vision for year 2010 calls for developing 300 new incubators)
Korea	300	AABI figure: 289 as of Oct. 3, 2003
China	400	AABI figure: Beijing, China: 400 as of end 2002; Shanghai, China: 436 as of 2002; Taipei, China: 69 as of January, 2004
India	80	AABI figure: India: 76

[18]Adapted from Source: University Grants Commission of India (Apex Body of the Government of India) retrieved on 28.03.05 from website: http://www.ugc.ac.in/new_initiatives/kbe.html

However, there are difficulties with the figures reported (above) and not least the figure reported by UKBI. UKBI holds that there are 220 incubator environments in the UK (illustrated below).

Figure 3.6: UK Distribution of EU BICs and UKBI Incubators



Population Density

- 2,200 to 7,670
- 950 to 2,199
- 650 to 949
- 420 to 649
- 280 to 419
- 180 to 279
- 100 to 179
- 0 to 99

Key

- BIC Distribution – UK (EBN)
- BIC Distribution - Republic of Ireland (EBN)
- Incubator Distribution – UK (UKBI)

Source data: UKBI Incubator Database[1]

Evidently incubators are generally located in areas with relatively high population densities (urban locations) while only a small proportion of the incubator stock, as reported by UKBI, are located in peripheral regions or rural areas). However, UKBI's figures differ from EU Commission statistics obtained

from the EU Commissions Incubator Database (CORDIS) (2005) – Column A below – for reported incubator environments in the UK which in turn differ or are less than consistent with statistics found in the EU Commission Enterprise Directorate General's Final Report Benchmarking Business Incubators (2002) – Column B - see below:

Table 3.6: European Commission EU Incubator Statistics

Country	A 2005	B 2002	Country	A 2005	B 2002	Country	A 2005	B 2002
Portugal	8	23	Slovakia	1	-	Poland	4	-
France	83	192	Greece	8	7	Latvia	2	-
Ireland	7	6	Bulgaria	1	-	Finland	38	26
Belgium	14	13	Denmark		7	Austria	15	63
Germany	206	300	Spain	29	38	Italy	25	45
Lithuania	5	-	UK	263	144	Romania	2	-
Estonia	2	-	Luxembourg	1	2	Turkey	1	-
Czech Republic	2	-	Netherlands	10	6	Sweden		39

Naturally, this is not to say that the difference between the figures represents increases or decreases in incubator stocks and is more likely attributable to the selection of incubators included in the samples. As regards, incubator figures reported by incubator associations in general, it appears that they may be less than representative. Evidently, the stock of incubators as reported by UKBI is in fact a stock of incubators that has subscribed (paid) to be a member of the incubator association. However, by sampling regional figures for the East Midlands wherein UKBI reports the existence of 30 incubators in the region as a whole and cross referencing these figures with incubators in two of the six sub-regions in the East Midlands (as reported by the Alliance Strategic Sub-regional Partnership and the Greater Nottingham Partnership) it was found that in just these two sub-regions of 'North Nottinghamshire and North Derbyshire' and 'Greater Nottingham' (only two of the six sub-regions that comprise the 'East Midlands') there were in fact 31 incubators (listed below and illustrated overleaf) in these two sub-regions alone of which only seven were enumerated or represented in the UKBI figures.

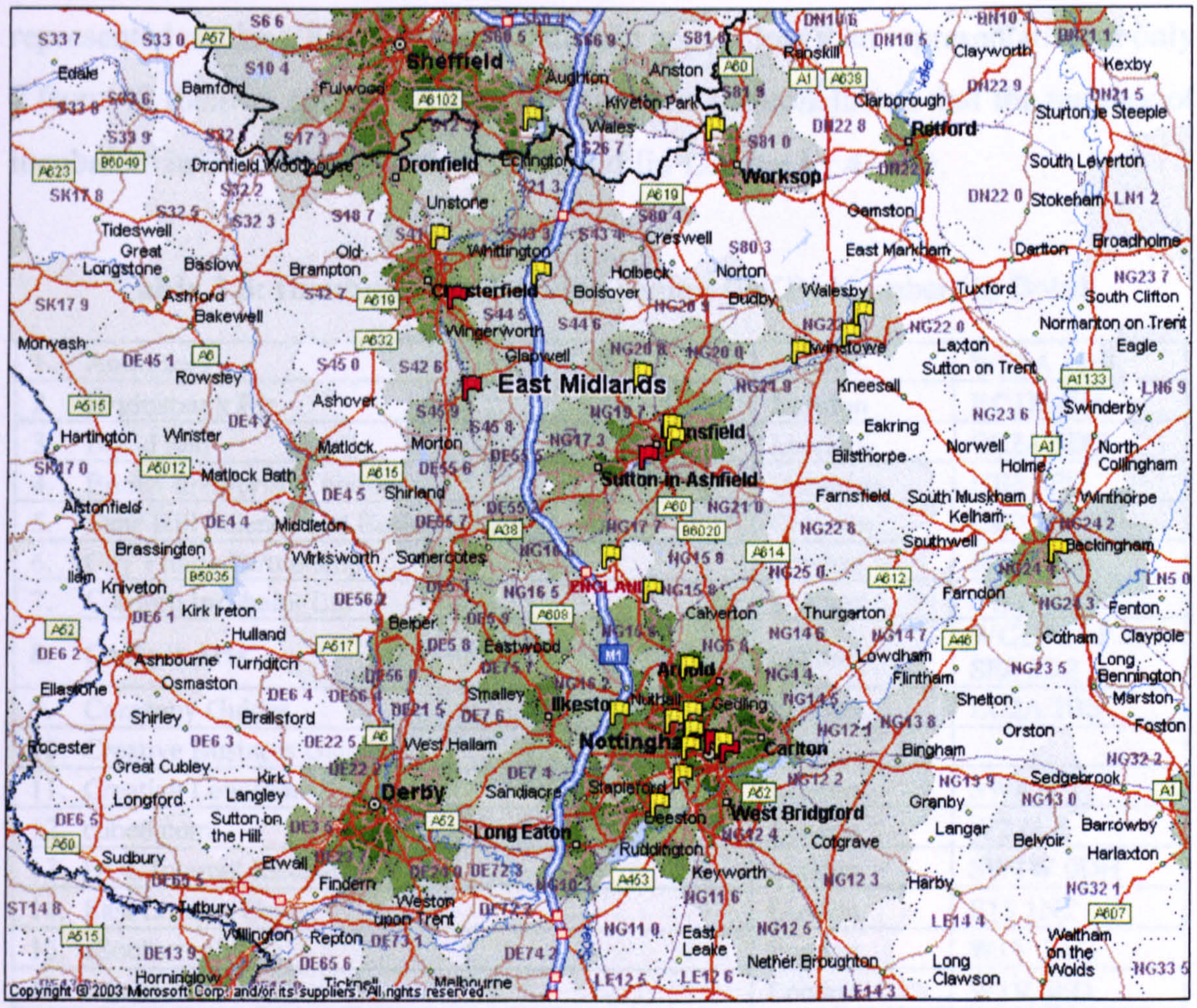
Table 3.7: Incubators in two of the six sub-regions of the East Midlands[19]

1. The Bearings	Newark	NG24 4BZ
2. Boughton Pumping Station	Ollerton	NG22 9HQ
3. Chadburn House	Mansfield	NG18 1AH
4. Coney Green Business Centre	**Clay cross**	**S45 9JW**
5. Dunston Innovation centre	Chersterfield	S41 8NG
6. Edwinstowe House	Edwinstowe	NG21 9PR
7. Mansfield Business centre	Mansfield	NG18 2AE
8. Mansfield I centre	**Mansfield**	**NG19 5BR**
9. Markham Environmental Technology Centre	Duckmanton	S44 5HS
10. Pleasley Vale Business Park	Pleasley	NG19 8RL
11. Ransonwood Business Park	Mansfield	NG8 6PE
12. E- Centre Sherwood Energy Village	Ollerton	NG22 9QS
13. Tapton Innovation Centre	**Chesterfield**	**S41 0T2**
14. Westthorpe Innovation Centre	Killamarsh	S21 12Z
15. Turbine	Worsop	S81 8AP
16. Bio City	**City**	**NG1 1GF**
17. Blue Coat Incubation Centre NBV	Wollaton	NG8 5GY
18. Broadway Media Centre	**City**	**NG1 3AL**
19. Castle Cavendish	Radford	NG7 5PN
20. Nottingham Fashion Centre	City	NG1 3BB
21. The Hive	**City**	**NG1 4BU**
22. Innovate Office	Sherwood Park	NG15 ODA
23. Lenton Business Centre	Lenton	NG7 2BY
24. Mercury House	New Basford	NG7 7FN
25. Nottinghamshire International Clothing Centre	Hucknall	NG15 8AY
26. UNIEI Lab	**Wollaton**	**NG7 2RQ**
27. New Brook House	City	NG7 5LR
28. Nottingham Science and Technology Park	Lenton	NG7 2RQ
29. S.G.C.S. Business Park	Beeston	NG9 2ND
30. Southglade Food and Drink Park	Hucknall	NG5 9RG
31. Strelley Hall Business Centre	Strelley	NG8 6PE

If these figures are taken as representative, UK figures as reported by the UK's national incubator association may be significantly understated (in this case by 343%).

[19] Source: Alliance SSP Strategic Partnership and independently confirmed by telephone interviews conducted with incubator managers and staff on 28.04.05 cross referenced with UKBI database

Figure 3.7: Incubator distribution in two of the six sub-regions of the East Midlands (UKBI and Non UKBI Incubators)



Population Density

- 4,958.50 to 33,480.00
- 3,352.00 to 4,958.49
- 2,260.00 to 3,351.99
- 1,365.40 to 2,259.99
- 601.00 to 1,365.39
- 199.00 to 600.99
- 63.52 to 198.99
- 0.00 to 63.51

(persons per km^2 - 2002 data)

Key

Incubator Distribution - Alliance SSP / GNP Area and featuring in UKBI database of incubators)

Incubator Distribution - Alliance SSP / GNP Area (incubators not featured on UKBI database of incubators)

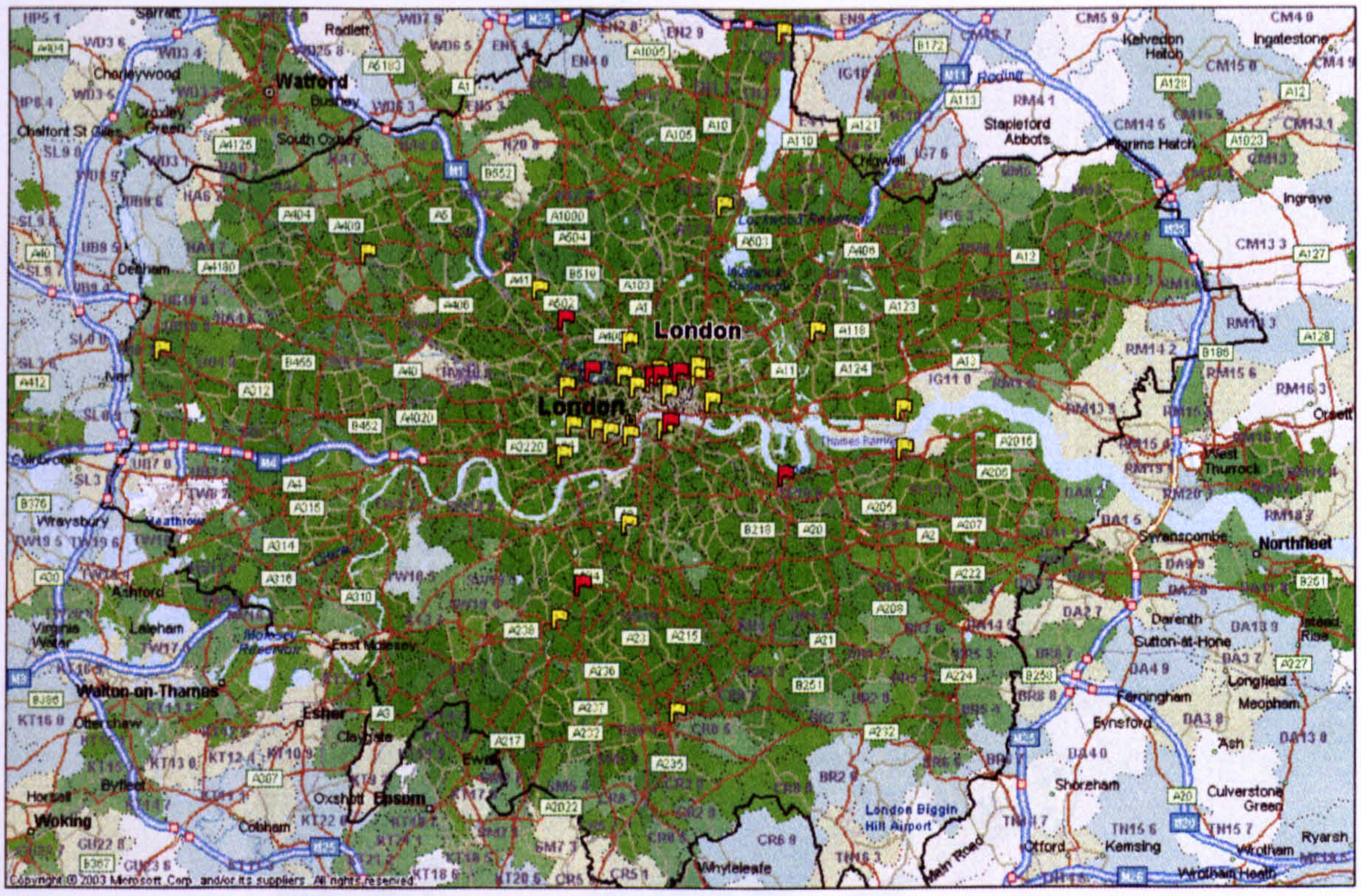
As may be observed from the above the concentration of incubators generally accords with population density and there are relatively few incubators in areas with a relatively low population density.

Similarly in the London region cross referencing the number of 'incubators' identified in the course of this study against those acknowledged or rather represented on the UKBI incubator database appear less than representative as only 7 from 40 (below) appear. Again, this supports the conclusion that the number of incubators in the UK is grossly understated (in London by 471%).

Table 3.8: Incubators in London region (UKBI Members in Bold)

1. Antfactory	London	WC1A 1HB
2. Brainspark Plc	**London**	**EC1R 4PA**
3. Brand Sell	London	EC2A 3DQ
4. Brunel Enterprise Centre	Uxbridge	UB8 3PH
5. Cane Hill Science and Business Park	Croydon	CR9 3JS
6. City Fringe Partnership	London	EC2P 2EJ
7. Cobweb Incubator Ltd	London	SW19 2RD
8. Cockpit Arts	London	WC1N 2NP and SE8 3DZ
9. Company Guides	London	EC2A 2BS
10. Creative Business Gateway		
11. Creative Lewisham	London	SW4 9PT
12. cube8.com	London	W2 6LE
13. DDL Internet Incubator	London	SW1W 0DH
14. East London Centre	London	E15 1NT
15. eSouk.com	London	W1Y 1AG
16. e-Start.com	London	W1V 5FD
17. E-Synergy Limited	London	EC4Y 8JT
18. Fast Future Ventures	London	NW2 2QB
19. First Base	Middlesex	HA1 8LT
20. Gavron Business Centre	**London**	**NW1 6DD**
21. Gorilla Park	**London**	**EC1Y 0TA**
22. Hoxton Bibliotech	London	EC1V 9EY
23. idealab	London	W1R 1RB
24. Ideas hub	**London**	**NW3 5JS**
25. Imperial College Innovations Ltd	London	SW7 2QA
26. Internet Incubator	London	SW1X 8JU
27. kickstartventures.com	London	SW10 9PT
28. Knowledge Dock Centre	London	E16 2RD
29. Lee Valley Technopark	London	N17 0LN
30. Lodestone Innovation Partners Ltd	London	W1T 4HJ
31. London BioScience Innovation Centre	London	NW1 0TU
32. London Business Innovation Centre Limited	Enfield	EN3 7XU
33. Medway Innovation Centre	Chatham	SE18 6PF
34. New Media Knowledge	Harrow	HA1 3TP
35. OFEX	London	E1 8AT
36. Peabody Trust	London	SE1 7JB
37. Software Business Network	London	WC1R 4QN
38. The Ideas Factory	London	SW1P 2TX
39. Wandsworth Youth Enterprise	**London**	**SW17 0RG**
40. WHEB Partnership	**London**	**SE1 8EN**

Figure 3.8: Incubator distribution in London (UKBI and Non UKBI Incubators)



Population Density	Key
4,958.50 to 33,480.00	Incubator Distribution - (incubators featured in the UKBI database of incubators)
3,352.00 to 4,958.49	Incubator Distribution - (incubators not featured in the UKBI database of incubators)
2,260.00 to 3,351.99	
1,365.40 to 2,259.99	
601.00 to 1,365.39	
199.00 to 600.99	*As above, the concentration of incubators generally accords with population density and there are relatively few incubators in areas with a relatively low population density.*
63.52 to 198.99	
0.00 to 63.51	
(persons per km^2 - 2002 data)	

Similarly, NBIA figures may be similarly flawed as again the association is one which in which the members are admitted on the basis of their annual subscription as are, in fact, members of the European BIC association and the German Incubator Association ADT. Further, as is illustrated below, not all

incubators are affiliated to the German incubator association ADT (Andere Zentren) and thus caution should be exercised in accepting figures, as stated by incubator associations as being representative (non-ADT-affiliated incubators marked below in red).

Figure 3.9: Distribution of Incubators in Germany

(ADT and Non-ADT accredited)



Adapted from source: ADT

It has also been suggested in the course of this research that even EBN figures re the number of BICs may not be fully representative as a number of BICs may have dispensed with or otherwise allowed their membership (and thus BIC status) to lapse for which a number of explanations have been advanced:

- the benefits of association did/do not accord with the costs/level of subscription; and/or
- that in any event local accreditation or stake-holding is more significant than pan-european networking, endorsement or standards;

- that the costs of association or membership (over and above the basic subscription charge) including attendance at transnational events and conferences did not represent value for money (re cost benefit) or prompted criticisms from within and outwith the organisation that the additional costs amounted to little more than 'jollies' for executives or otherwise did not represent value for money.

Similarly, it has been suggested that a great many of the UK's incubators have not availed themselves of UKBI membership and for similar reasons.

3.13 Summary

Notwithstanding the difficulties in quantifying the number of incubators that now exist in the EU, according to the EU Commission's Enterprise Directorate-General's Benchmarking of Business Incubators Report (2002, page 35), incubators as they have evolved in the EU have been established in the main by a range of stakeholders that include EU and/or other international agencies (13.4%), national authorities and public agencies (25.3%), private sector organizations (20.8%), universities and other R&D organizations (16.4%) and community and voluntary organizations (11.5%) – p.34 . 24% of incubators in the EU are considered public agencies, 28% semi-public and 37.6% considered private or otherwise independent of the public sector (10.4% unknown).

However, even in the UK and upon a strict construction of their legal status, many incubators registered as private or independent businesses are in fact charitable companies limited by guarantee. Although classified as private sector businesses, the nature of their operations and the way in which they conduct it is more often than not, analogous to a public body - according to the EU Commissions report 21.8% of incubators are said to be operating on a for-profit basis, 76.9% on a Not-for-profit basis (p.41).

In the US, according to NBIA, about 25 percent of business incubators are sponsored by academic institutions, 16 percent are sponsored by government entities, 15 percent are sponsored by economic development organizations, 10

percent are sponsored by for-profit entities and 10 percent are sponsored by other types of organizations while about 5 percent of business incubators are "hybrids" with more than one sponsor (19 percent of incubators have no sponsor or host organization). Most North American business incubators (about 90 percent) are non-profit organizations focused on economic development. About 10 percent of North American incubators are for-profit entities; usually set up to obtain returns on shareholders investments.

Evidently the majority of EU incubators are situated in urban locations (54.4%), while the remainder are distributed between Greenfield, rural locations and others (24%, 6.4%, and 10.4%, respectively) and have been established in a range of properties that include new and converted premises (60.3% and 21.8%, respectively) – p.36. While in the US, 44 percent of business incubators draw their clients from urban areas, 31 percent from rural areas and 16 percent from suburban areas. In addition, nearly a tenth (9 percent) of all incubators draw clients from outside their region or from outside the United States[20].

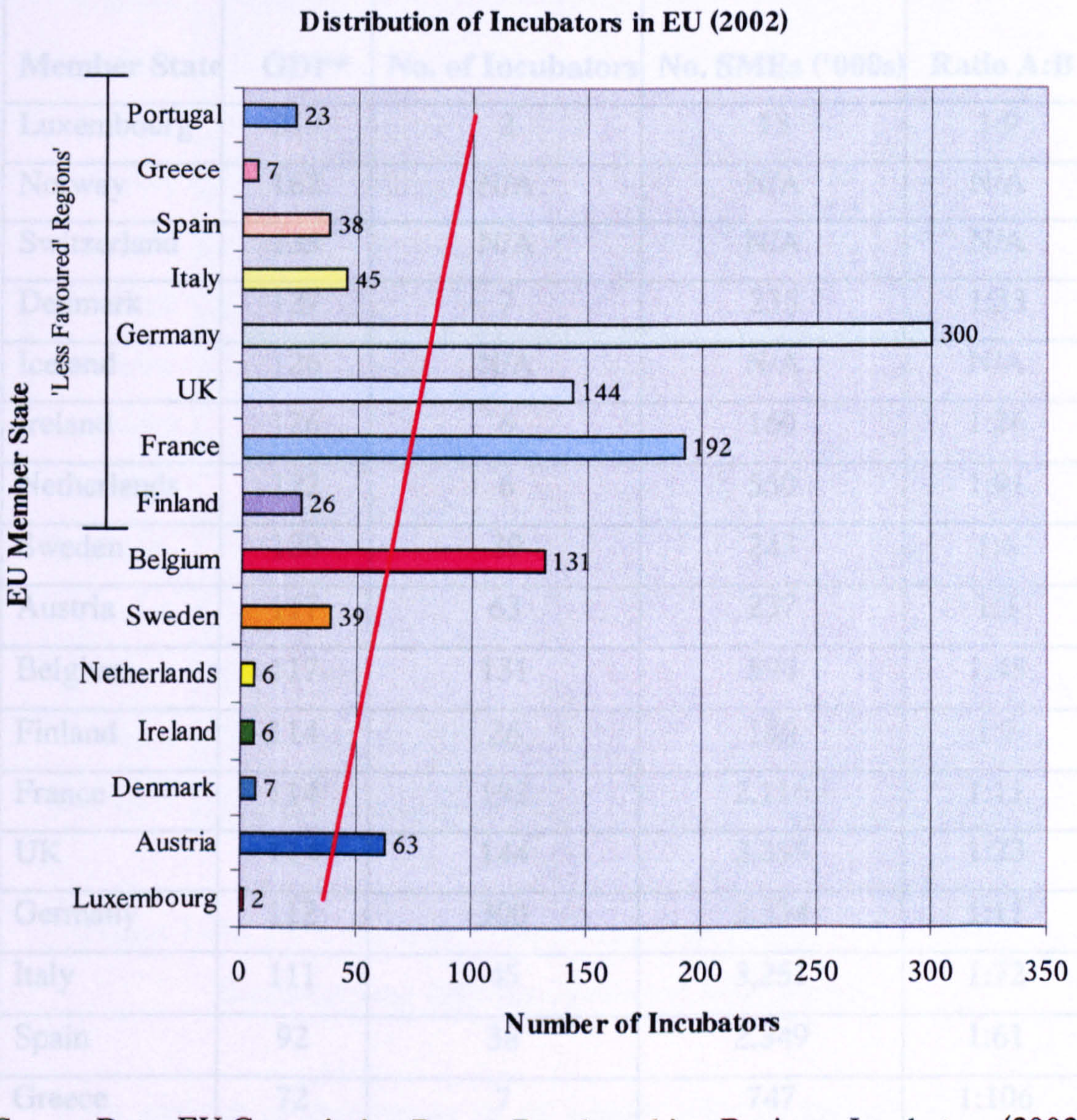
In any event, and whichever dataset is selected as a basis for comparison of the development and deployment of the modality in the EU and in 'less-favoured' regions of the EU, there is evidently a wide variation vis-à-vis the deployment of the incubator modality in purely numerical terms and by Member States. For example, using figures reported in the EU Commission Report Benchmarking Business Incubators (2002, p.9), wherein an incubator is defined by the authors as:

> "A business incubator is an organisation that accelerates and systemises the process of creating successful enterprises by providing them with a comprehensive and integrated range of support, including: incubator space, business support services, and clustering and networking opportunities. By providing their clients with services on a 'one-stop-shop' basis and enabling overheads to be reduced by sharing costs, business incubators significantly improve the survival and growth prospects of new start-ups. A

[20] NBIA (2005) retrieved on 14.04.04 from National Business Incubation Association website:, http://www.nbia.org/resource_center/bus_inc_facts/index.php

successful business incubator will generate a steady flow of new businesses with above average job and wealth creation potential. Differences in stakeholder objectives for incubators, admission and exit criteria, the knowledge and intensity of projects, and the precise configuration of facilities and services, will distinguish one type of business incubator from another" incubator deployment is profiled as follows:

Figure 3.10:



Source Data: EU Commission Report Benchmarking Business Incubators (2002)

As may be observed from the chart above, cross-referencing the number of incubators per Member State against national GDP (Luxembourg (Highest) and Greece (Lowest)), it may be observed (from the trend-line) that the number of incubators per Member State generally decreases relative to increased GDP. Furthermore, EU data, presented in the EU Commission's Benchmarking Report

(pp.13-14), points to wide variations in the 'density' of business incubator developments. As illustrated below, while Austria has the highest 'density' of incubators per SME (1 incubator per 3,000 companies), Greece has the lowest 'density' - 1: 106,000 SMEs. With the exception of Belgium and the Netherlands, the lowest densities of incubators are to be found in southern EU Member States.

Table 3.9: Distribution of EU Incubators by Country and No. of indigenous SMEs

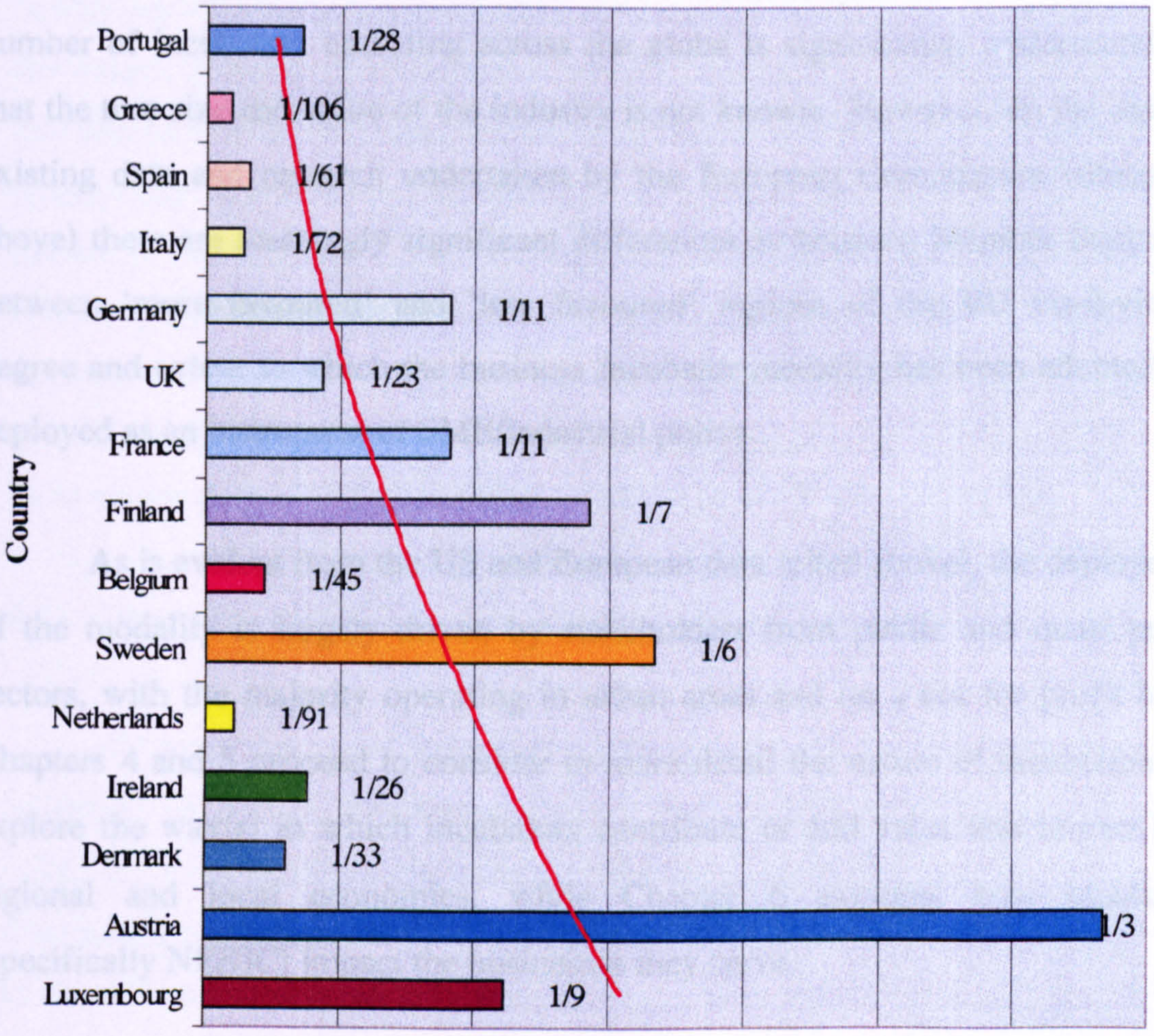
Member State	GDP*	No. of Incubators	No. SMEs ('000s)	Ratio A:B
Luxembourg	219	2	18	1:9
Norway	162	N/A	N/A	N/A
Switzerland	135	N/A	N/A	N/A
Denmark	127	7	235	1:33
Iceland	126	N/A	N/A	N/A
Ireland	126	6	160	1:26
Netherlands	122	6	550	1:91
Sweden	120	39	243	1:6
Austria	117	63	237	1:3
Belgium	117	131	594	1:45
Finland	114	26	180	1:7
France	114	192	2,116	1:11
UK	114	144	3,355	1:23
Germany	112	300	3,334	1:11
Italy	111	45	3,251	1:72
Spain	92	38	2,349	1:61
Greece	72	7	747	1:106
Portugal	46	23	656	1:28
Average	**119.2**	**911**	**18,025**	**1:19**

Source Data:*GDP - Eurostat News Release STAT/04/145 3 December 2004; and
EU Commission Directorate General Enterprise (2002) Benchmarking Business Incubators Final Report

Furthermore, as may be observed from the chart below, EU countries in 'less favoured' regions (lower than average EU GDP) tend to have a lower intensity of business incubators per head of population than regions with a higher GDP per capita.

Figure 3.11:

Distribution of Incubators in the EU
by number of SMEs (thousands) and by country



Source Data: EU Commission Directorate General Enterprise (2002)

Benchmarking Business Incubators Final Report

An analysis of this nature is, of course, only of limited value because business incubators generally have very specific target markets and this data does not reveal, for example, the nature, level and scale of incubator operations. Nonetheless, it does provide an overview as to where incubation has been deployed and with what intensity, relative to the national enterprise stock.

In summary, incubation is evidently not only a European but also a worldwide phenomenon, as may also be illustrated with reference to the number of incubator associations that have emerged around the globe (see Chapter 5) and is a business support modality that is continuing to evolve (see also Chapter 4). While it is difficult to get a 'fix' on the number of incubators operating throughout Europe, it is likely from the research undertaken in the course of this study and notwithstanding the semantics of what 'is' and what 'is not' an incubator that the number of incubators operating across the globe is significantly understated and that the true size and value of the industry is not known. However, on the basis of existing data and research undertaken by the European Commission (illustrated above) there are seemingly significant differences as between Member States and between 'more favoured' and 'less favoured' regions of the EU vis-à-vis the degree and extent to which the business incubator modality has been adopted and deployed as an instrument of SME/industrial policy.

As is evident from the US and European data (cited above), the deployment of the modality is largely driven by stakeholders from public and quasi public sectors, with the majority operating in urban areas and on a not for profit basis. Chapters 4 and 5 proceed to consider in more detail the nature of incubation and explore the way(s) in which incubators contribute or add value and impact their regional and local economies, while Chapter 6 explores how incubators (specifically NEBIC) impact the businesses they serve.

Chapter 4: European Business and Innovation Centres (Case Studies)

4.1 Introduction

This chapter commences with an overview of the BIC model, the distribution of the BICs across Europe and how European BICs are financed. In order to investigate the way in which BICs contribute or 'add value' to their locality and/or region, as prescribed by the terms of the ESRC Case Studentship, this chapter proceeds to compare the nature of incubator operations, services and activities of 5 BICS (presented as case studies below and which include a detailed consideration of the North East Business and Innovation Centre - the industrial sponsor of this research). The case studies were compiled from desk research, reviewing BIC literature – generated with and outwith the incubator community - and interviews with BIC personnel managers and staff (currently employed and retired) and BIC personnel and stakeholders attending the 10th EBN Congress in Porto between the 4th and 6th of October, 2002.

4.2 European Business & Innovation Centres: Background

As noted above, this research is particularly concerned with incubation and incubators and, specifically, European Community Business & Innovation Centres – E.C. BICs – which were originally established as an instrument of the European Community's regional policy. The origins of the BIC concept can be traced back to the recession of the 1970s which prompted [in Europe] the development of policy, instruments and action(s) [by European, National, Regional and Local Authorities] to regenerate areas affected by the decline of traditional industries by endeavouring to create or foster conditions that would support alternative employment opportunities. They were established as regional organizations, with the general objective of contributing to the stimulation of local economies in regions of the EU with a GDP less than the EU average undergoing/requiring industrial restructuring and/or having industrial potential and classified specifically as Objective 1, 2, 5b, 6 regions as per the EU Structural Fund classifications of the European Regional Development Fund which have evidently been integral to their development. This context for BIC operations, has historically been fundamental

to the multiplicity of BIC rationales, the nature and level of their operations (thought not in all cases as the modality has also operates in what might be considered 'more favoured' regions without Structural Fund support e.g. St Johns Innovation Centre, Cambridge).

As noted in the Commission of the European Communities DGXVI Regional Policy and Cohesion Evaluation of Community Measures in support of European Community Business and Innovation Centres (EC – BICs – 1998) BICs were designed as a structured approach to a policy of services to support the launch of innovative businesses (principally in the manufacturing industry or in allied services). Following the first BIC experiment in 1983 involving the SOCRAN ("Société de Création d'Activités Nouvelles") Centre in Liège (Belgium), the model was adopted and diffused throughout Europe and perhaps most extensively between 1984-97. In 1991, the first BICs were established in Central Europe in Prague and Brno (Czech Republic) and following a European Commission Evaluation of the BIC programme between 1997-98 BICs were included as an integral element of European Regional Policy as reflected in the EU Commission's 1999 Guidelines for Structural Fund programmes for the period 2000-06.

Specifically, BICs were required to (by DGXVI) to commit to a number of general objectives, which may be summarised as follows:

1. The stimulation of local economies, by gearing human, physical and financial resources to strengthen the business sector, in particular the creation of new SMEs (not subsidiaries of large enterprises) and the development of existing SMEs, and sources of innovation and technological advancement. (Evidently, this incubator 'brand' or typology does not accord with much of the literature and categorisation therein that regards incubators as concerned with business creation only).
2. The development of a systemized and coherent organization of business services, especially in the less favoured regions of the EU (a key feature in the development of those BICs established with ERDF funding vis-à-vis avoiding duplication and assuring additionality). In addition, as explored

in the following chapter this mission 'aim' is now much more a strategic/business imperative for a great many BICs as locally, regionally and nationally the competition for leadership in the field, patronage and public funds intensifies.

3. Increasing the efficiency of public programmes and aid and improving the access of entrepreneurs and SMEs to business services and enhancing their chances of success.

4. Supporting the creation and development of independent businesses by offering a complete range of business support services as well as by mobilizing public and private resources and organizations with responsibility for economic development in the area.

Since its introduction, the BIC model has developed variously in response to regional conditions and has been framed to respond regional economic needs, the structure of business support services, regional endowments and the nature and level of remedial actions, policy and the attendant funding framework. With the evolution and maturing of the BIC model, the objectives have now been refined (by and now operated by EBN) to support the Commission's 'EC BIC' accreditation arrangements. EBN (2004, p.25) now defines a BIC as a 'Regional Economical Development Tool aimed at developing innovation'. Furthermore, as according to the EU Commission (undated)[1], a decision to establish a BIC must be based on "a long-term commitment to improving the regional economy through the development of innovative businesses", which to an extent, represents an acknowledgement that the development of a BIC and all that this entails so as to render it sustainable in the long term is itself a substantive and long term programme[2].

---

[1]European Commission (undated) Guide to European Business Innovation Centres Factsheet 4.a (Setting up a BIC) retrieved on 20.05.05 from website:
http://europa.eu.int/comm/regional_policy/innovation/innovating/pdf/fiche_4a_en.pdf

[2] A number of incubators in the US and UK have closed as stakeholders have misunderstood this fundamental point i.e. the level at which incubator projects must be resourced at start up and in the short term to medium term to achieve critical mass and presence within the business support infrastructure and become self-sustaining. There is an anxiety within and outwith the community, in the UK at least (and observed in the US), that the rate at which incubators are being set up and the level of addition will ultimately undermine the ability of funding agencies i.e. local authorities and regional development/enterprise agencies) to adequately resource them all.

The stipulation that BICs focus on innovation now requires BICs to define what "Innovation" means in their catchment area and define what kind of enterprise should be created [and supported by them] to render the territory more competitive and/or what processes or changes are required in existing SMEs in order to increase their competitiveness (technological, commercial, organisational, financial change). In the event that the territory shows R&D potential, technological innovation should be a priority. Furthermore, the European Business and Innovation Centre Network (EBN) criteria for BIC accreditation (2004, p.1ff)[3] stipulate that a BIC must:

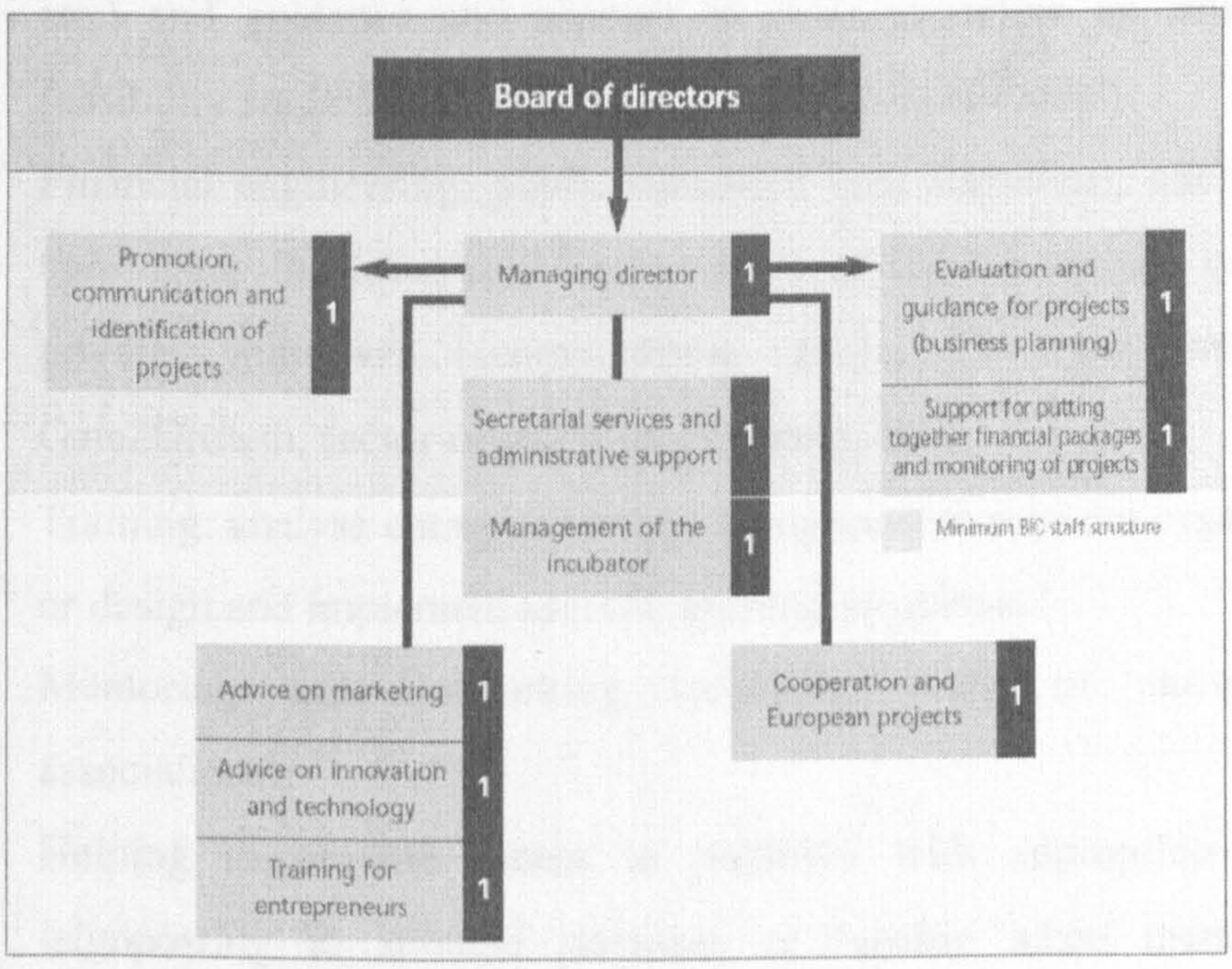
- Work in a specific catchment area (a region, province, city etc.). In practice, however a number of BICs examined in the course of this research have developed interests outwith their region and in any event as businesses in their own right this 'requirement' constraining the development of the BICs and their long term sustainability is somewhat incongruous. Upon further investigation, it appears to that the stipulation was introduced to ensure that BIC resources are focused with the requisite intensity to deliver added value (and not so diluted i.e. spread so thinly so as to undermine the ability of a BIC to deliver substantive benefits thus undermining the BIC brand) and also to avoid duplication and possibly conflict (i.e. competition between BICs in the same territory and/or for the same clients is not regarded as desirable);
- Be acknowledged by public authorities who are relevant within the framework of their mission. As may be observed from the Case Studies (below) acknowledgement in regional strategies and plans, representation in key decision trees/strategic groups and ultimately institutional support (in political and financial terms) is key to success and failure. As regards the latter, it is suggested these failings were factors in the closure of Pronovus and the London BIC insofar as they failed to attract and/or retain patronage and financial support)

---

[3] EBN (2004) 'BIC Observatory – An overview of the BIC approach in its 20th year' (10 March 2005) retrieved on 20.05.05 from EBN website: http://quality.ebn.be/Documents/2-BIC%20quality%20mark%20criteria.pdf

- Be either public or private, and work in coordination with other support organisations (see Case Studies below);
- Have an allocated budget;
- Have a clear positioning, strategy and action plan aimed at creating new jobs through the creation of innovative companies or bringing forward existing companies (See Case Studies for Mission Statements/Aims and Objectives);
- Have identified premises (a BIC may also be hosted by a bigger organisation);
- Have an identified staff of at least 3 people full time able, as a minimum (at start-up), to promote/communicate and identify projects and provide evaluation, strategic guidance and back-up services for projects and entrepreneurs[4]) and when 'fully operational' should ultimately comprise (as a minimum) 8-10 people configured as follows:

Figure 4.1: Model Organisational BIC Structure



Source: European Commission Guide to European Business Innovation Centres Factsheet (4.b)

[4] European Commission (2004) 'Guide to European Business Innovation Centres Factsheet (4.b)' retrieved on 17.07.04 from European Commission website: http://ec.europa.eu/regional_policy/innovation/innovating/guidec_en.htm

In addition, BICs are also now expected to:

- Support authorities in designing and implementing local development programmes aimed at creating new innovative SMEs and/or bringing forward existing SMEs. These programs may concern spin-off engineering, clustering, internationalisation, entrepreneurship (females and ethnic minorities, environmental innovations, training and coaching entrepreneurs, interregional benchmarking, and improvement of the availability of finance.
- They must develop a methodology in order to promote, support, detect and generate innovative companies.
- Be active in terms of incubation (creation of innovative enterprises) or SME support.
- Provide incubation services which should include, for example:

    - Risk analysis pre-creation (technology, marketing, human resources etc.) and guidance and support in order to define an action plan, feasibility studies, budget forecast, and a business model;
    - Financial engineering: public measures (tax, subsidies), alternative to bank loans (business angel networks, seed capital, venture capitalists, private initiatives (competitions etc.), EU programs (FP6, Gate2Growth, sector-oriented programmes, etc.);
    - Training: analyse entrepreneur needs, signpost to relevant organisations or design and implement specific training programs;
    - Mentoring and Networking (coaching, clubs of entrepreneurs, associations);
    - Helping to provide access to premises with appropriate services (signposting to suitable premises or hosting when managing an incubator); and
    - Follow-up for 3-5 years after creation (continued access to financing, benchmarking against business plan to ensure realization and proposal for corrective actions if necessary. Follow- up may be partially sub-contracted but BICs should be proactive in the prevention of business failure.

Figure 4.2: Example Incubation Service Model[5]

WESTBIC 'New Business Development Path'

1. Evaluation And Assessment Of The Project

2. Product/Service Screening

(a) Feasibility Testing

(b) Market Research

3. Technical Development

(a) Product Development

(b) Research And Development,

(c) Customer Testing & Evaluation

4. Business Analysis

(a) Business Planning,

(b) Financial Planning,

(c) Sources Of Funding,

(d) Cash-Flow And Profitability Forecasts,

(e) Human Resources

5. Marketing And Selling Strategies

(a) Product Launch,

(b) Marketing Plans,

(c) Sales Strategies

6. Commercialisation

[5] Source: WESTBIC (2004) retrieved on 29.01.03 from website:http://www.westbic.ie/new-business-development-path.html

- Provide services to existing SMEs that might include, for example:

  - General diagnostic of the gaps to innovation: SWOT analysis; recommendations and action planning;

  - SME consulting: support aimed at increasing their innovation profile (marketing, financing etc.);

  - SME vocational training (e.g. internationalisation, management, IP etc.); and

  - Include SMEs in specific projects (clustering, enterprise take over, technology transfer, female management, renewable energy, etc – see case studies below)

Depending on the characteristics of the territory and the existing actors, BICs may place emphasis on fostering the creation of new innovative enterprises and/or developing innovation in existing enterprises. BICs may also support non-innovative businesses with e.g. consultancy, diagnostic, and training programmes or through other programmes concerned with e.g. internationalisation, clustering, enterprise, succession planning, take-over, exits, licensing, franchising, etc.

4.3 Deployment of European Business Innovation Centres

At the time of writing there are reportedly some 155 BICs now operating throughout the EU (accredited to the EBN criteria/standard) that, prima facie equates to 7.3 BICs per country. However, having profiled the distribution of BICs by country as is illustrated below, this figure does not accurately represent the degree and extent to which the modality has been adopted and deployed.

Table 4.1: Deployment of EU BICs by Country

AUSTRIA:	RIZ NÖ Holding GmbH
BELGIUM:	Bureau Economique de la Province de Namur; CAP Innove (Centre d'Accompagnement de Projets Innovants); CEEI Héraclès; CEEI ID Scrl; CEEI Socran; IDELUX; Innotek; Maison de l'Entreprise S.A.
CZECH REPUBLIC:	BIC Brno; BIC Ostrava spol.s r.o.; BIC Plzen; Technology and Innovation Centre (TIC) Prague; Technology Centre
DENMARK:	B.I.C. Nord; EURA A/S - Regional Development Company Ringkjoebing County
FINLAND:	B.I.C. Carelia; BIC BOTNIA; BIC Kymi; BIC Oulu; Culminatum B.I.C.; Technology Centre Kareltek; Western Finland B.I.C.
FRANCE:	ACCET- CEEI Val d'Oise; Aditec pas de Calais CEEI; Carrefour Entreprise Sarthe; CCI de Lyon Equipe d'animation NOVACITE; CEEI 47; CEEI Alimentec; CEEI Alsace; CEEI CAP ALPHA; CEEI d'Ille et Vilaine CREAT'IV; CEEI de Nîmes; CEEI Gers-Gascogne; CEEI Provence; CEEI Pyrénées; CEEI Quimper-Cornouaille; CEEI Synergia - La Technopole Caen-Normandie; CEEI Théogone (Parc Technologique du Canal) Conseil Général; CEEI-CAP DELTA; CICOM Organisation; Futura Corse Technopole; Nantes Atlanpole; Orléans Technopole; Plein Sud Entreprises; Promotech Nancy; Régie Départementale des Ruches d'Entreprises; Saint-Etienne Métropole; SAVOIE TECHNOLAC; Synergie; Technopole de l'Aube en Champagne; THESAME- Mécatronique & Management; Toulon Var Technologies
GERMANY:	BIC Frankfurt (Oder) GmbH; BIC Kaiserslautern; BIC Leipzig; BIC Nordthüringen GmbH; BIC Zwickau GmbH; IGZ BIC Altmark GmbH; TZ Ludwigshafen - BIC Rhein-Neckar-Dreieck GmbH

GREECE:	Bic Larissa; BIC of Attika; BIC of Epirus; BIC of Western Greece
HUNGARY:	Innostart- National Business and Innovation Centre
ICELAND:	IceTec (Technological Institute of Iceland)
IRELAND:	Cork Business and Innovation Centre; Dublin Business Innovation Centre; Innovation Centre Limerick; South East Business and Innovation Centre; West B.I.C.
ITALY:	Agenzia Lumetel; Agenzia per lo Sviluppo; B.I.C. Omega; B.I.C. Varese Polo Scientifico e Tecnologico Lombardo; BIC - Sviluppo Italia Friuli Venezia Giulia S.p.A.; BIC Lazio SpA; BIC Marche Scarl; BIC PROMOFIRENZE; Bic Puglia Sprind SpA; BIC Salerno Srl; BIC Sardegna S.p.A; Bic Sicilia srl. Centro Europeo di Impresa e Innovazione; BIC Umbria; C.I.I. Pistoia S.C.R.L.; CEI Calabria EUROBIC Scpa; CEII Trentino; CODEX Scrl; Creazione d'impresa – Tecnopolis; CSP - BIC Livorno S.R.L.; Euro-Bic Abruzzo e Molise Scrl; Euro-BIC Vallée D'Aoste; EUROBIC - Agenzia per lo Sviluppo del Territorio scrl; Eurobic Sud Sicilia - BIC Gela; Eurobic Toscana Sud S.p.A; Euroimpresa Legnano; Fondazione IDIS Città della Scienza; Innova BIC SpA; Parco Scientifico e delle Telecomunicazioni in Valle Scrivia; Sviluppo Italia Campania SpA; Sviluppo Italia Basilicata SpA; Sviluppo Italia Calabria S.C.p.A.; Sviluppo Italia Liguria; Sviluppo Italia Puglia SpA
LUXEMBOURG:	Centre de Recherche Public Henri Tudor
NETHERLANDS:	Bic Noord-Nederland; BIC Twente; Business Development Friesland
NORWAY:	Forskningsparken As

PORTUGAL:	BIC Algarve Huelva; BIC do MINHO; CEISET Centro de Empresa e de Inovaçao de Setubal; Centro de Empresas e Innovaçao - B.I.C. Madeira; Centro Promotor de Innovaçao e Negocios; CIEBI Centro de Innovaçao Empresarial de Beira Interior; N.E.T.- Novas Empresas e Tecnologias, S.A. - BIC do Porto
SLOVAKIA:	BIC Bratislava; BIC Spisska Nova Ves s.r.o.; Cassovia BIC s.r.o.
SPAIN:	Barcelona Activa S.A.; Beaz S.A.; BIC Berrilan; Bic Euronova S.A.; Bic Galicia; BIC Granada; CEEI ALBACETE; CEEI Alcoy; CEEI Bahía de Cádiz Centro de Lanzamiento Economico; CEEI Baleares; CEEI BURGOS; CEEI Castellon; CEEI Ciudad Real; CEEI de Asturias; CEEI de Cartagena; CEEI de Castilla y Leon; CEEI de Navarra S.A.; CEEI de Valencia; CEEI Elche; CEEI Talavera de la Reina; CEEI ARAGON S.A.; Centro de Empresas e Innovación de Alava S.A.; Eurocei Centro Europeo de Empresas E Innovacion S.A.; Instituto Tecnológico de Canarias
SWEDEN:	B.I.C Mid Sweden AB; Bic Sweden West AB
SWITZERLAND:	CimArk
UNITED KINGDOM:	Birmingham B.I.C.; Coventry University Enterprises Ltd; Greater Manchester Bic; Hertfordshire Business Incubation Centre Ltd; Innovation Centre Noribic; Technology Enterprise Kent; London BIC; North East of England B.I.C.; Pronovus Ltd - East Midlands BIC; St Johns Innovation Centre Ltd; Staffordshire and Black Country BIC; Tapton Park Innovation Centre

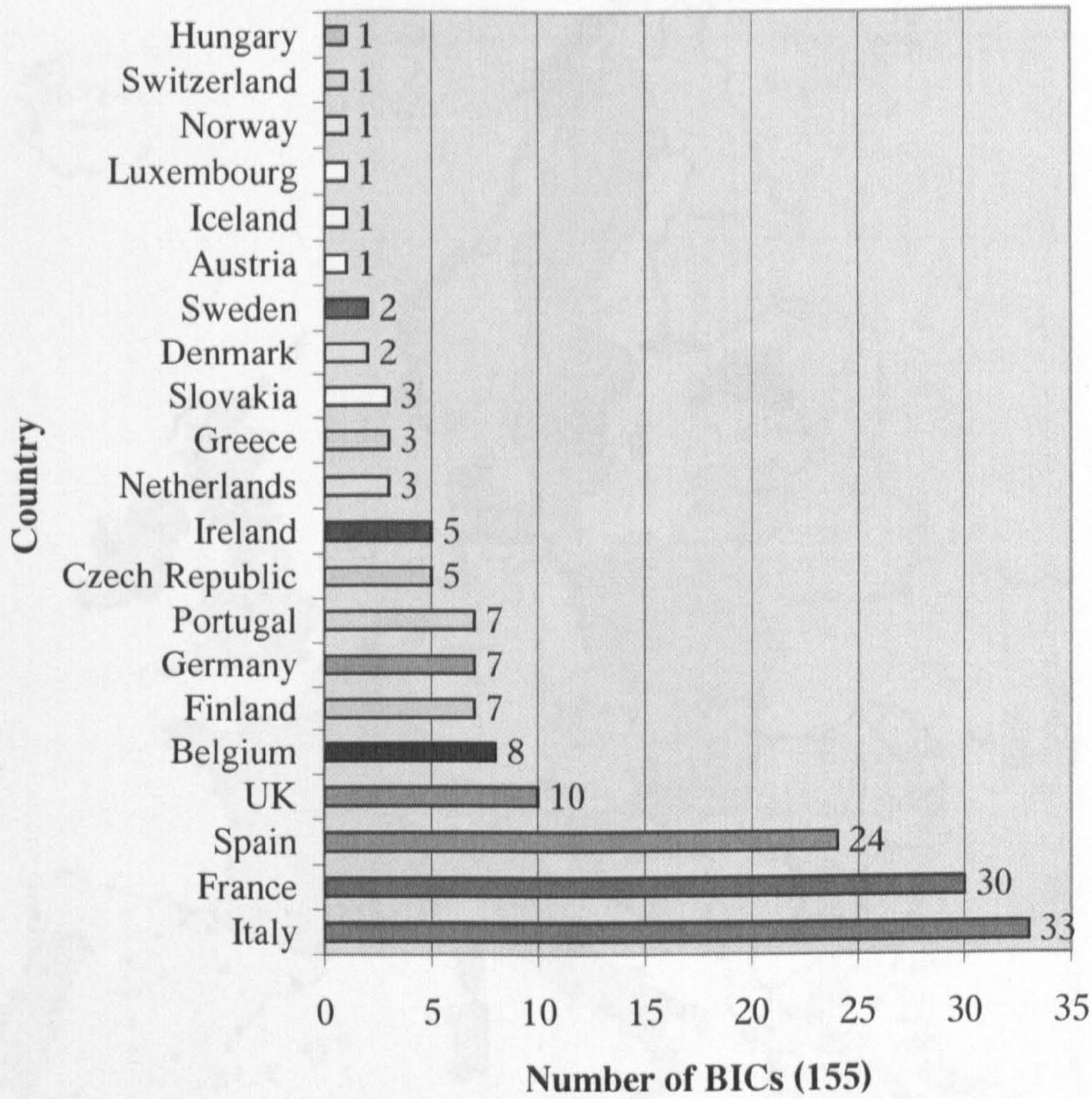
The number of BICs reported for the UK [and illustrated below] has been adjusted as this research has established that 2 of the 12 BICs listed by ebn as operating in the UK have ceased trading. Pronovus ceased trading on the 12th of April 2005 while at the time of writing, as explained in Chapter 3, it is understood that the London BIC is in liquidation (PriceWaterhouseCoopers LLP acting as liquidators).

As regards Pronovus, it is understood that Pronovus in Nottingham (like NEBIC a local TEC-led initiative backed by EU funding and financially supported in part by the City Council and which was formerly called the East Midlands Regional Technology Advisory Centre) provided counselling support to innovative small companies (technical advice, IPR issues, marketing and finance) ceased trading as it was unable to secure funding (public) to enable it to continue.

While Pronovus was in essence a small virtual incubator with approximately 5 personnel, it evidently remained dependent on public subsidy. Further, it was seemingly unable to resist competition (for local and regional resources and patronage) given the increased number of new entrants to the industry (locally and regionally, e.g. universities developing incubator capacity and with physical infrastructure i.e. business units and thus with sustainable revenue streams (rents) - a model that has seemingly achieved a currency with the BIC community and found favour with sponsors as the preferred modality). It should also be noted that Pronovus is not the only virtual BIC to have failed as evidently so too has BIC SwedenWest.

Notwithstanding this adjustment, as illustrated below, 56% of the BICs in the EU are, in fact, to be found in just three countries, namely Italy, France, Spain (21%, 19%, and 15%, respectively), three of the aforementioned 'less-favoured regions'. The UK (another of the aforementioned 'less-favoured' region) accounts for 6% of the BIC stock.

Figure 4.3: Distribution of BICs (2004)

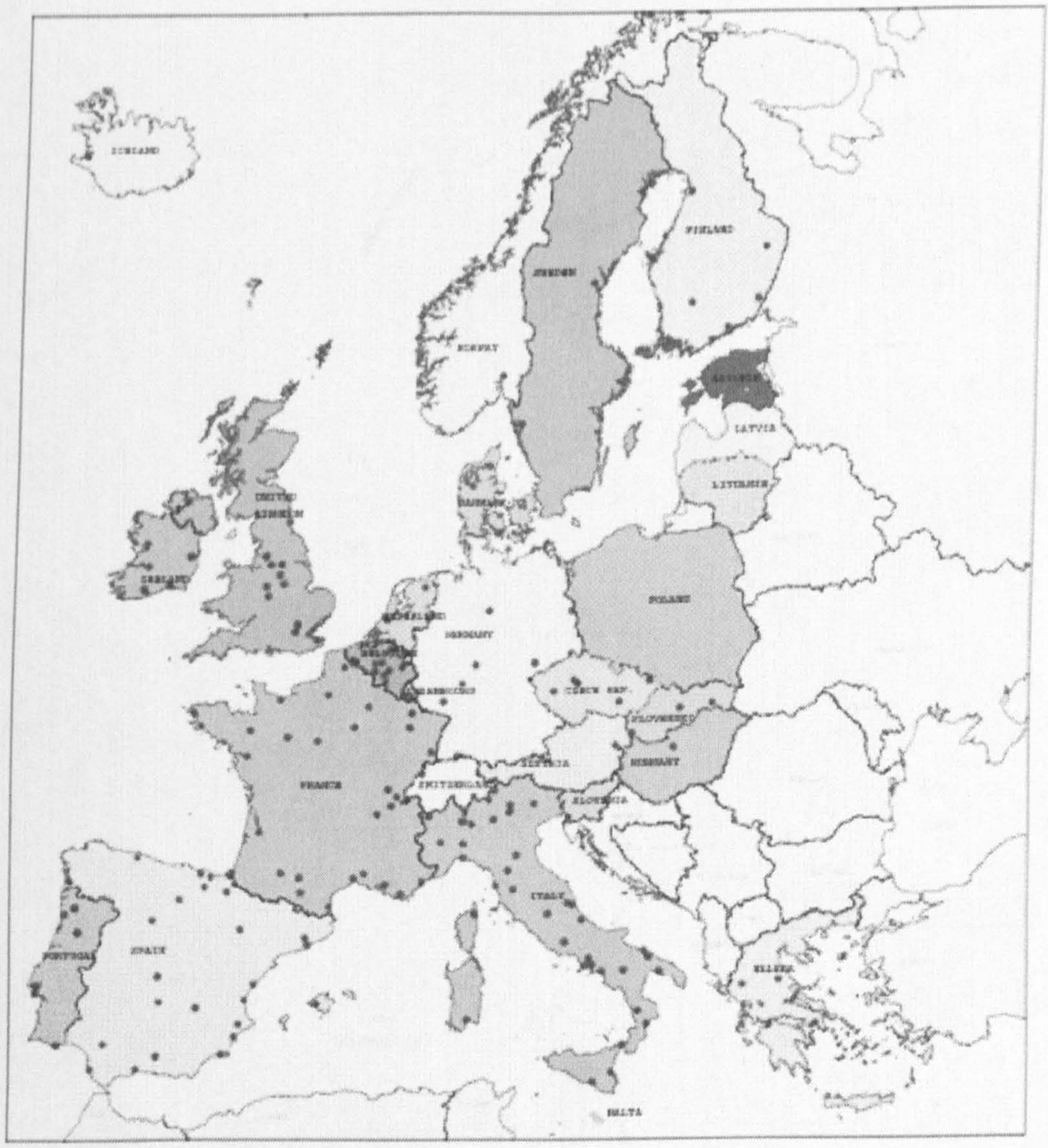


Source data: EBN[6]

According to EBN's 2004 BIC Observatory report (10th of March 2005, page 12) 56% of the BICs are based in areas with less than 100,000 SMEs and less than one million inhabitants, with a ratio SME/population lower than 12%. 90% are located in an area with less than three million inhabitants with 15% SMEs.

[6] Source data: retrieved on 10.03.2005 from EBN website:www.ebn.be

Figure 4.4: Distribution of EU BICs

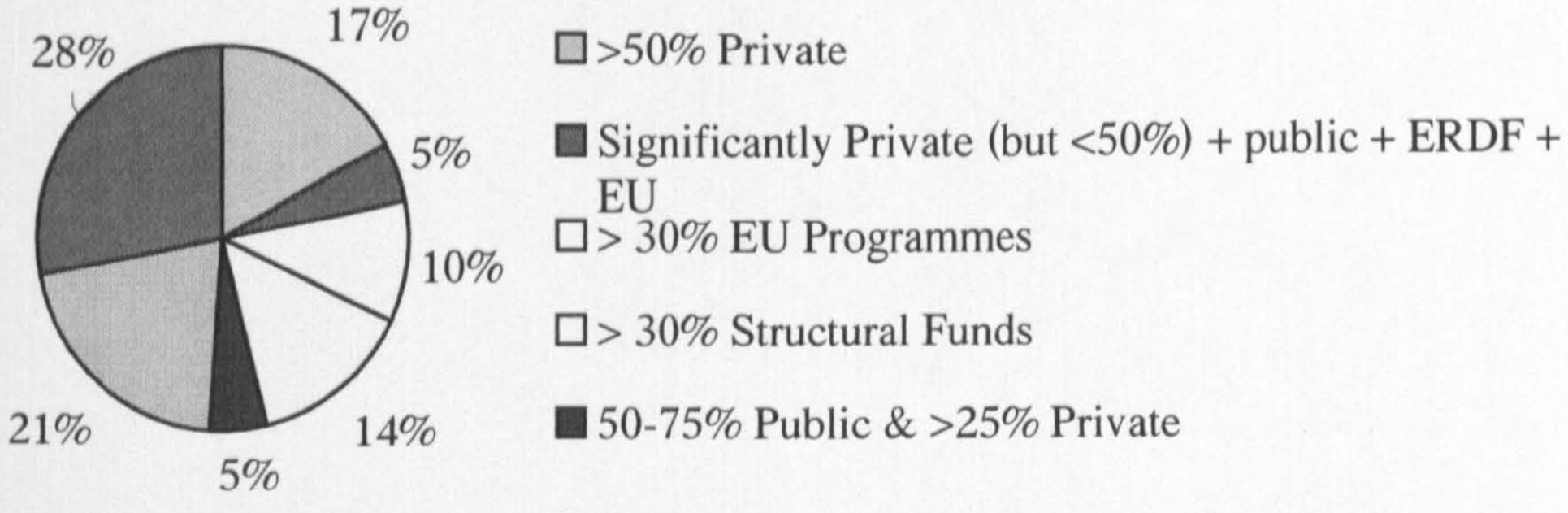


Source: EBN 2004 Observatory Report

4.4 EU BIC Business Model

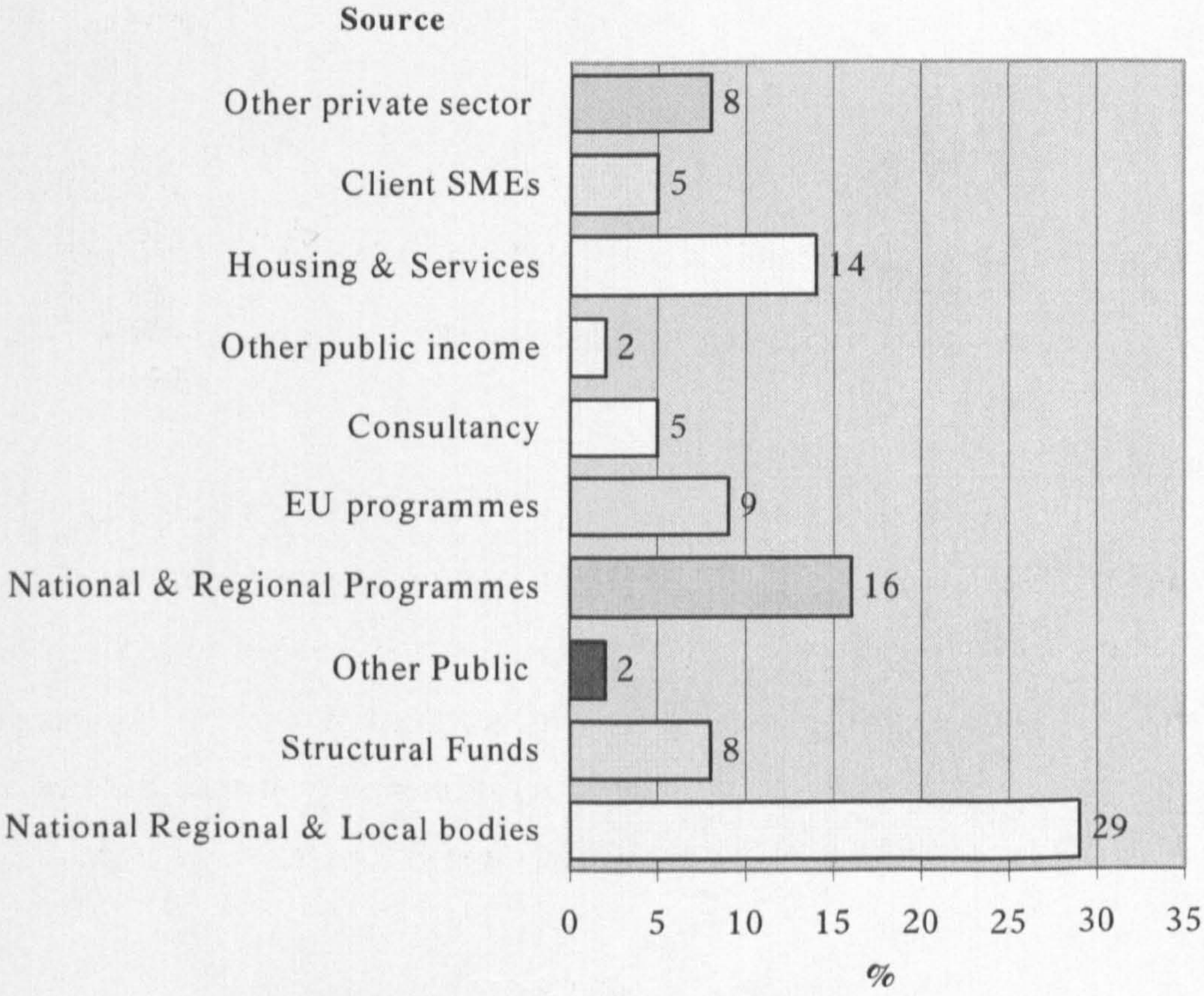
Evidently, the financial models as they have developed for BIC operations across the EU are complex and diverse but may be said (albeit broadly) to be largely public-based. According to EBN data 54% of BICs received more than 50% of their funding from public bodies, while EU programmes are also a principal source of revenue for approximately 25%. 71% of BIC revenue is derived from services (contracts) with public authorities (at European, national and regional level), however 17% of BICs now said to generate more than half their income from private sources:

Figure 4.5: BIC Business Model



According to EBN the BIC network generated a total of 188M€ revenue in 2003; 55M€ from private sources, 32M€ from EU funds/programmes and 101M€ from national or regional bodies (some of which may also be in part from EU programmes). More specifically, as illustrated below, 62% of total BIC income is derived from their involvement in broad EU, national or regional programmes - 63% financed at the national or regional level and 47% at the EU level.

Figure 4.6: BIC Revenue Streams



Source Data: EBN 2004 Observatory Report

A segmentation of EU BICs European programme revenues (see table below) is particularly revealing as to the place of EU BICs in EU policy, particularly regional policy and as an instrument in employment and social affairs. Indeed, this profile of revenue illustrates, perhaps better than anything else, the nature of BIC operations and their role in and relationship with efforts to promote regional, social and economic cohesion:

Table 4.2

Profile of BIC Revenue derived from EU Programmes (%)	*%*
DG Regional Policy	45.2
DG Employment, Social Affairs & Equal Opportunities	26.9
DG Research	7.2
DG Enterprise & Industry	6.5
DG Education & Culture	6.5
DG Information Society & Media	2.5
DG Enlargement	1.8
DG Energy & Transport	1.1
DG Europaid - Co-operation Office	1.1
DG Fisheries & Maritime Affairs	0.4
DG Environment	0.4
DG Press & Communication	0.4
Gen. EU Secr.	0.4

Source Data: EBN www.ebn.be accessed on 24.11.2004

The Chapter proceeds to consider the development and operation of 5 BICs which have been prepared via a combination of desk research, observation of BIC operations; and interviews (face-to-face (casual) and telephone (structured) with BIC personnel, clients, tenants and stakeholders.

The Case studies review the background (context for development); mission (aims and objectives); governance (management arrangements); facilities (including tenant profile where available) and resources; services and activities (including service contracts and projects representative of the BIC operation) and concludes with observations on each BIC studied.

Of the BICs selected for study, NEBIC was prescribed for study in the terms of the ESRC Case Studentship; Coventry BIC was selected as an example of a university operated BIC and St John's Innovation Centre because of the economic prosperity of the region (which is in stark contrast to that of the North East of England). Kent BIC was selected for study as it operates from multiple locations (an emerging trend amongst the more mature incubators); and Hertfordshire BIC because at the time of writing it was the newest addition to the stock of BIC incubators. Also selected for study was London (Lee Valley) BIC given the novelty of the business model (taking equity in assisted businesses in exchange for the incubators assistance), however the BIC went into administration before any study could be undertaken. Pronovus (Nottingham BIC) and BIC SwedenWest were also selected for study as examples of BICs operating a 'virtual incubator' model (providing no accommodation for assisted businesses). Unfortunately, both BICs closed seemingly for lack of patronage (political and/or financial) or had otherwise proved unsustainable before detailed study could be undertaken. The case studies are presented as follows:

- **Case Study 1:**
  North East of England Business & Innovation Centre (NEBIC) - Extended
- **Case Study 2:**
  Coventry University Enterprises Limited (Coventry BIC)
- **Case Study 3:**
  Technology Enterprise Kent (Kent BIC)
- **Case Study 4:**
  St Johns Innovation Centre, Cambridge
- **Case Study 5:**
  Hertfordshire Business & Innovation Centre (HBIC)

Case Study 1

North East of England Business & Innovation Centre

Background:

The North East BIC was established at Sunderland Enterprise Park (East) in 1994, on the former Austin and Pickersgill shipyard on the banks of River Wear, by Sunderland City Training and Enterprise Council (TEC) and was the only TEC led BIC in the UK. Founded with a broad remit, which may be said to have reflected the competencies, strategic and operational objectives of the founding partners (see below) the collaborating partners were committed to:

- the strengthening of manufacturing industry and the promotion of Sunderland as a major centre of Advanced Manufacturing Technology;
- the expansion of the automotive sector;
- meeting identified skill shortages and addressing the demand for managers, professionals and technicians in new technology, engineering and accounting disciples;
- providing management skills for postgraduates – especially those from technical and scientific disciplines;
- the pursuit of innovation and the expansion of the local R&D effort – recognizing the important role of R&D in regional economic development; the development of human resource capabilities, enterprise and interpersonal skills – awareness of technological, environmental and European issues for all; and
- widening access and encouragement of life-time learning through education and training.

The creation of the BIC was prompted by a number of factors. First, the decline of traditional industries in Wearside, notably shipbuilding and coal-mining had left a legacy of high structural unemployment. Further the pre-dominance of large-scale undertakings (employers) which accounted for approximately 90% of those considered economically active was considered to have ingrained throughout the sub-region an 'employee mentality' and a weak entrepreneurial culture (a

picture that could be observed throughout the US and Europe in or around this time).

Secondly, a high proportion of those employed in services were then employed by the local (public) authority while in manufacturing which was characterised by a high degree of manual labour the capacity to generate added-value per employee (p.a.) was less than two thirds of the regional average.

Thirdly, Wearside's manufacturing capability and capacity (and thus a significant proportion of employment) was largely geared to motor vehicle assembly and components manufacturing, food processing, glassware, clothing, and mechanical engineering (e.g. aero engine components, offshore cranes, and industrial pumps). While accurate statistics were not available it was thought that approximately 40 firms in the sub-region employed over 200 people, a core element of around 15-20 were thought to engaged in advanced manufacturing. The vast majority of the estimated 6,000 enterprises in Wearside (>90%) were thought to be small businesses employing fewer than 20 people.

The pressure to develop solutions to support economic regeneration and the diversification of indigenous industry was particularly acute. Further, it was acknowledged within Wearside Training & Enterprise Council, the lead sponsor of the BIC at the time, that it and fellow organisations with a significant competence or roles in the economic regeneration of the Wearside region including Sunderland City Council, The Wearside Opportunity, Tyne & Wear Development Corporation, Northern Development Company and English Estates were pursuing largely uncoordinated strategies although these organisations were collectively committed to developing Wearside as the 'Advanced Manufacturing Centre of the North'.

The lack of connectivity at the time is illustrated by the fact that the TEC, City Council and University of Sunderland were compelled to establish a joint working party (the 'Wearside Euro Group') which commenced its work by reviewing the mission statements of each three organisations mission statements with a view to establishing:

- a degree of mutual understanding;

- a mutually agreed common statement of objectives;
- the development of a Wearside European Strategy (co-ordinate and improve the leverage, planning and deployment of European subsidies and grants, particularly structural funds); and
- an agreed Wearside Strategy for Innovation and Enterprise.

Significantly, the City of Sunderland had been awarded £37.5 million in grant aid (UK Government City Challenge funding) to support the regeneration of some of the most socio-economically deprived areas of the city located to the north of the River Wear by improving social conditions and the development of sustainable employment opportunities via self-employment, enhanced training and education provision, and empowerment initiatives.

In summary, a combination of developments in the region and pressures (political, fiscal, social and economic) with and outwith the region demanded a clearer and more coherent strategy for economic development and closer coordination of development initiatives to lever support from UK central government and European Community resources. Evidently, it was mutually agreed between the main economic development agencies that they should:

- Promote and seek to build on Wearside's manufacturing traditions;
- Persevere with attempts to attract inward investment to Wearside, but at the same time exploiting the indigenous potential for job and wealth creation by encouraging entrepreneurship and new business start-ups, thereby ensuring that an over-dependence on a few large employers is avoided;
- Strengthen linkages between industry and higher education with a view to enhancing the capacity of firms to innovate and exploit new technologies;
- Continue to develop the area's physical infrastructure, in particular by increasing the provision of high-quality industrial and business premises, to support strategies to attract inward investment and encourage business development;

- Support and enhance the indigenous skills base by supporting training, retraining so that the indigenous population remained sufficiently skilled to take up employment opportunities, thereby reducing the area's high unemployment rates.

It was also determined that the (then) existing provision of managed workspace in Wearside was geared to serving the self-employed (the level of self-employment was lower than the national average) and small businesses engaged in basic manufacturing and artisanal activities. These enterprises, which were typically the recipients of 'Business Boost' support, were considered to have a limited capacity to create jobs and wealth.

Furthermore, it was explained in the course of interviews with NEBIC managers and staff that there was also "a growing recognition that strategies aimed at regenerating the sub-regional economy [Wearside – it is important to note that the NEBIC was originally conceived as a sub-regional instrument] were primarily concerned with attracting inward investment as a means of creating a modern, technology-orientated industrial base". In addition, it was acknowledged "the establishment of branch operations (largely assembly plants) had not been generally accompanied, however, by the transfer of high added value activities (e.g. R&D) into the area by parent companies. Similarly, it had been observed that local sub-contracting by these branch operations/inward investors accounted for a relatively low proportion of their procurement". In addition, "while a number of property developments in the sub-region had significantly increased the sub-regional stock of business units which were designed with a view to attracting further inward investment, only a small proportion of the available space was considered suitable for smaller businesses".

Evidently, there was an increasing appreciation that alternative or complementary approaches to existing economic development strategies and plans concerned with supporting self-employment and attracting inward investors were required, specifically, to create the conditions to foster the development of innovative, high added value business start-ups with the capacity to have a significant impact in terms of local job and wealth creation. The stakeholders were

agreed that the sub-region was no different in terms of its entrepreneurial potential, to other areas that (then) qualified for assistance via the European Structural Funds (Objective 2). The drive to establish the BIC was also reinforced by a confidence that the modality was achieving results in comparable regions, specifically, Barcelona where the [then] Chief Executive of Sunderland City Training and Enterprise Council had apparently observed a flourishing BIC and returned with the determination to develop one for Sunderland and the North East of England.

The aim was to create a business and technical support organisation geared towards developing new innovative companies, providing them with intensive support during the tentative early stages of development. Added to this, the aim was to have a physical presence of small business units allowing companies to start small and expand into larger units as they grew and prospered. However, as explained in the course of this research, "It took [however] two years to persuade all the relevant bodies that they needed to invest in this new concept of a BIC. Eventually £3 million was ploughed into the first phase with 50 per cent funding coming from the TEC's own financial coffers and the remainder from European Regional Development Funding and the Tyne & Wear Development Corporation".

The North East of England Business & Innovation Centre (as it was then known – the name has recently been changed to North East Business & Innovation Centre) was subsequently founded with the following principles:

- To work together [founding partners] towards an agreed development strategy;
- To take an integrated approach to education, training, research and development and to business development;
- To encourage enterprising attitudes, partnership and consortium working, and the development of networks;
- To foster self-employment and the establishment of new small businesses;
- To support the growth of expanding small and medium sized companies;
- To exploit the indigenous potential of the area, including ideas and innovations on the one hand, and natural and man-made assets and features on the other;

- To raise the general cross-the-board level of education and training of the local population;
- To encourage innovative approaches to education, training and business development;
- To respond to the needs of industry and commerce – both home-grown companies and inward investors;
- To widen access of opportunity to those presently excluded from the training and labour markets;
- To exploit new technologies to these ends; and
- To develop high quality infrastructure in support of the above, including improving the quality of training, research and enterprise development facilities.

Mission Statement/Aim(s):

To support the development of an innovation culture in the North East.

Corporate Objective(s):

- To achieve financial targets as set out the in annual plan thereby ensuing the Company continues to build upon its resources and provide a solid base from which to further develop in the future;
- To maintain ISO 9001 and achieve the new standard
- To achieve the Investors in People standard to reinforce the Company's commitment to quality improvement and its staff
- To reinforce the BICs Regional Status by establishing business and technical support links to other parts of the North East
- To continue to develop and build upon existing relationships with decision makers/funders, including ONE, GONE, SBS and Europe
- To improve overall customer satisfaction rating

Operational Objective(s):

- To offer a co-ordinated integrated, comprehensive range of Business Support services to individuals and SMEs

Governance:

Following the abolition of the TECs in March 2001, a Charitable Company Limited by Guarantee was established to which the assets and liabilities of the TEC's BIC were transferred and the BIC has subsequently continued to operate as a going concern and as a not for profit, independent (private) entity. The Company has 5 directors, all male with an average (mean) age of 50.4 years

Facilities:

The BIC occupies a 14 acre site, providing 200,000+sqft of business accommodation. The BIC's physical assets include 9 buildings on the site which have been erected between 1994 and 2002 which includes Light industrial units from 355 - 6250 sq. ft (33 - 581.4m2); Offices from 100 -1500 sq. ft (9.6 - 140 m2); and a range of Incubator units - specifically for start up businesses.

The BIC site has been developed in 9 phases reflecting the evolution of regional strategic, economic and funding priorities (and the availability and accessibility of said funds particularly EU Structural Funds i.e. ERDF and ESF Objective 2, ESF Objective 3 & 4). Local authority patronage (political and financial) has also been instrumental in the development of the overall scheme.

Phase 1, the Main Building - which includes an all day nursery, restaurant and 43 business units, as well a central reception and atrium area was established in April 1994 and was followed by Phase 2 in March 1995 with the establishment of the Slipway Centre which [then and now] comprises 53 business units, including office and light industrial units. 1998 witnessed a significant expansion of facilities and resources wherein Phases 3-6 were established which comprised the creation of Industrial Units and the Product and Process Development Unit (October 1998) – to assist companies and individuals throughout the region to design, test and develop products and processes; 24 dedicated incubator units and

12 units for biotech businesses (November 1998); a Technology Complex accommodates mainly IT and energy efficient companies (December 1998) and the BIC's training and conference facility - The Jupiter Centre (December 1998). In subsequent years, an additional industrial unit was added in March 1999 (Phase 7); Anderson House in April 2000 (grow on space) – Phase 8 and Innovator House (Phase 9 – April 2002) incorporating 26 purpose built e-business offices and an ICT training suite.

Tenant Profile:

Initially, the BIC's target market/clientele was to be drawn from:

- Graduates and staff from Sunderland University;
- Referrals from the sub-regional network of existing managed workspaces and the Sunderland Business and Enterprise Centre;
- Enterprises linked to large employers in the area, including spin-offs, businesses established by ex-employees, and those established to act as local suppliers;
- Referrals from the North East Innovation Centre and projects that its clients may wish to pursue using the BIC as a proxy; and
- Residents of North Sunderland and those affected by further rationalisation of the coal mining industry.

This clientele has however been further extended as the BIC has evolved capabilities and capacity (services and accommodation) and as the BIC has sought to represent and service the whole of the North East of England. Tenants include other business support organisations, charities, social enterprises, and a range of new and established businesses (see Appendix 3 for full tenant profiles).

Resources: Personnel

The BIC employs 45 personnel as follows:

Table 4.3: NEBIC Personnel functions

General Management	7
Administration	3
Entrepreneurs guidance and support (Evaluation, Business Planning, access to financing, follow-up)	12
EU / national / regional project management	3
Incubator management (rent, common services)	12
Communication, events, animation (e.g. inter-firm cooperation)	5
Training entrepreneurs	3
Other	
Total	45
In addition, the BIC reports that it has assembled a people bank of 300+ associates/sources of supplemental and specialist expertise.	

Services:

As noted above, the BIC provides a large portfolio of accommodation with 24-hour access and security and onsite parking an attribute that has attracted the majority of tenants questioned in the course of this research to the site. As noted above the accommodation features a mix of offices & industrial units from 100 to 6,250 sq ft (Hi-tech, IT and bio-tech accommodation), laboratories; Meeting, Conference and Training Rooms; and Incubator units. The accommodation is offered with all inclusive rental packages and 'easy in - easy out' tenancy agreements, internet and e-mail access and I&CT Support (again considered key aspects of the NEBIC offer by tenants. In addition, the facility incorporates a restaurant, nursery, central administration (Mail & Package Handling) and reception support. The tenant package also includes access/support from a range of business support measures, technical services, business skills training and business mentoring. Other services include advice on European Legislation;

access to Video Conferencing facilities and the BIC ISDN Access and Digital telecoms network, networking events, technology demonstrations, and an innovation fund.

The BIC is keen to distinguish itself from other forms of managed (principally office) accommodation and as part and parcel of its 'industrial/manufacturing' credentials has operated a Product Process Development Unit (PPDU) since 1998. This facility comprises a large workshop facility (50m x 10m), equipped with machines for both light industrial and commercial work and is equipped with, for example, lathes, millers, a pillar drill, surface grinders, band saws, MIG / TIG welding units and gas cutting equipment. The Unit also has the capability and capacity to fabricate a wide range of materials, including steel, aluminium, brass, and stainless copper and manages a network of local contractors for specialist or high volume jobs, like CNC or laser cutting. The unit is also equipped with CAD packages including AutoCAD, Inventor, Solidworks, Rhino3D, OrCAD and Protel, and is staffed by an experienced team of engineers with a range of experience gained in industries such as explosion protection, car component manufacture, steel production and electronic component design. The unit boasts experts in industrial, mechanic, hydraulic, pneumatic, electronic and aesthetic fields assisting firms to 'improve production output', 'design and construct new production and process machinery', and assists client with 'mechanical, electrical, electronic and industrial design', the production of 'concept drawings and prototypes', 'new product development', 'intellectual property advice' and the 'brokerage and management of joint venturing arrangements'. The BIC has supplemented this offering with the addition of a rapid prototyping facility and circuit board production service.

The BIC has also established the 'Big Ideas Centre' (with support from the regional development agency One NorthEast and the Tyne & Wear Partnership). The Centre is based on the BIC site at premises formerly occupied buy the BIC's Technology Demonstration Centre[7]. The Big Ideas Centre's offering has been

[7] The TDC which previously employed experienced engineers advising businesses on a wide range of process technologies and energy and environmental best practices and provided consultancy vis-à-vis process and production problems; and promoted of new and emerging technologies struggled

developed with TWEBLO Limited - the local arm of a national initiative to promote work-related learning among young people at school and operating in 5 Local Authority areas in the region (Gateshead, Newcastle-upon-Tyne, North Tyneside, South Tyneside, and Sunderland). The offering has been developed in part to meet Department for Education and Skills priorities, namely:

- Developing understanding of the world of work and thus improve employment;
- To assist pupils to acquire the knowledge skills and attitudes that help to develop enterprise capability, financial literacy, and economic and business understanding;
- To enhance the delivery of the National Curriculum, in particular the work related learning element at Key Stage 4;
- To raise levels of achievement in schools and narrow the achievement gap;
- To improve the behaviour, attendance and motivation of pupils; and
- To contribute to the development of the school workforce.

Additionally, the facility has also developed services geared to private sector enterprises and public sector organisations e.g. Ambulance Service.

The BIC has also recently added to its portfolio 'Virtual Office Space' offering eligible businesses i.e. business who accord with the BIC's entry criteria (and under 12 months old) comprising a business address on site with dedicated email and Web site location (POP3 accounts), telephone number and answering service, post, parcel and fax handling facilities, use of fax, photocopier and document binding services, discounted rates on meeting rooms, training and conference and video conferencing facilities and Access to business and technical support. The BIC has also developed new laboratories and occupants can also benefit from priority use of a wide range of facilities, including an extensive ICT platform and the support of a team of business professionals.

---

for sustainability and when public sector support was withdrawn gave way to this new initiative which has found favour amongst public stakeholders and the business community – i.e. it is operating on a commercial basis.

Other significant elements of the NEBIC model include the development of a training arm (principally delivering 'off the shelf' training), a business consultancy arm (competencies include 'e-commerce'; 'finance'; 'franchising'; 'ICT'; 'marketing'; 'production' and 'succession planning') and a Regional Award for Innovation ('Spirit of Innovation Awards') recognising and rewarding specific categories on innovator/entrepreneur i.e. 'Students of all ages including schools, colleges and universities'; 'Individuals over the age of 18'; 'Companies with less than 20 employees'; and 'Companies with more than 20 employees'. The BIC has attracted additional sponsorship for the scheme from the Regional Development Agency ONE NorthEast; the University of Newcastle; the University of Sunderland; the Royal Bank of Scotland; and Robert Muckle Solicitors. Further, the event attracts interest from the region's universities, colleges, government office north east, local authorities, schools, the business support community (public and private) and professional firms.

Example Service Contracts:

NEBIC has been contracted by Business Link Tyne & Wear to provide business start up advice to Business Link clients throughout Tyneside and Wearside. The BIC has also recently signed contracts with both Sunderland and Gateshead Colleges to educate budding young entrepreneurs in setting up in business. The North East BIC has also been contracted by OneNorthEast (regional development agency) to oversee the development of incubation properties in the north east; administer the OneNorthEast funded Business Link Micro Loan Fund (since April 2002) to provide financial support to expanding organisations, whether they are a new business, a young company started by graduates or a firm employing up to 250 people and also delivers the regional 'Upstarts project' which aims to assist graduates to start up in business. The BIC has also arrived at an agreement with Northumberland County Council to administer their grant and loan scheme for start ups and is working with the University of Sunderland, assisting the New Entrepreneur Scholarships project, encouraging people from disadvantaged areas to attend university for the first time and learn about setting up in business for themselves.

In addition, the North East BIC has been commissioned by the regional development agency to map the region's innovation system/infrastructure and, in particular, the innovation process - as practised by regional practitioners – and including Intellectual Property Rights (Idea Creation, Idea Definition, IPR search, IPR Protection and Action Planning) Design (Technical Feasibility, Product Design, Prototype development, Product Testing, Design for Manufacture, Financial Viability and Funding); and Marketing (Market Research, Testing, Strategy and Launch). The BIC has also been contracted by Teesside Council to map incubator capacity and capability which includes facilitating consensus within the sub-region as to what amounts to incubation, an incubator and mapping the degree of variation within the incubator/incubation model as practised in the sub-region.

The BIC has also developed services as an internet service provider managing IT, email and internet contracts throughout the region. The BIC has recently formed a partnership with Knowledge IT, a firm of IT specialists in Washington with whom the BIC has collaborated on a range of projects, to form Nexent Technology with the aim of offering a range on integrated communications packages for businesses including data, voice, mobile and internet services, data recovery and round to the clock network cover.

The BIC is also instrumental in the development of facilities in and across the City of Sunderland to support scientific research and the bioscience research and industrial base under the banner 'Sunderland Science Park' in conjunction with the University of Sunderland, the City of Sunderland Government Office for the North East and the Regional Development Agency – One Northeast, the Tyne and Wear Partnership and Sunderland Arc (the Urban Regeneration Company (URC), established in 2002 to guide and deliver the regeneration of large areas within the City of Sunderland).

Example Projects:

The BIC is executing a number of grant assisted projects which include in their number an INTERREG IIIC, entitled TouriSME. The project represents a

joint collaboration between four European Partner Regions from (i) North East England, (ii) Saxony Anhalt in Germany, (iii) Limburg in the Netherlands, and (iv) Valencia in Spain to give school pupils and teachers the opportunity to share and develop enterprise skills. The North East's participation is being headed by NEBIC's Big Ideas Centre in collaboration with two local SME partners (a training company (Treepax) and innovation assessment organisation (Denkraam).

The BIC has/is also executing a range of ESF Objective 3 and ERDF Objective 2 projects that include, for example, the provision of:

- One-to-one counselling / information / financial advice (AIM or full Stock Market Listing);
- support to access (what were) SMART awards (in association with GONE), the Spirit of Innovation Award Scheme (NE-BIC) and the CRAFT Programme in collaboration with Beta Technologies Limited (National Contact Point);
- IPR and Patent advice;
- Technical expertise (guidance and facilities);
- Access to a framework of support to identify business needs, the preparation of marketing and business plans, the development of new markets/products/services, etc.
- Preparation of feasibility and risk assessments;
- Identification of international collaborators; and
- Support to implement organisational development techniques (e.g. Investors in People).

In addition, the projects also seek to match technical product/process innovators to experienced businessmen and women (and vice versa) with a view to forming new enterprises with the requisite mix of business competencies and technical skills'.

The BIC has developed and implemented the 'Corporate Ventures Programme', a project designed to support business starts created by individuals with supervisory and/or middle management experience and requiring graduate

recruitment as part of their business plan. The project endeavours to combine the technical and commercial expertise (and experience) of senior managers with the technical skills of new graduates. According to the project manager Willie Herdman "The project is not a graduate placement programme or specifically targeted at Graduates looking to start their own business. It complements other graduate programmes in the area and offers graduates an additional opportunity to move into the SME sector.... The project provides education at start-up and includes business planning, financial planning, market analysis, entering new markets, product development, marketing etc and is available at each stage of the trading cycle during the first three years of operation [in addition] the project supports the development of new businesses as a result of outsourcing and similar developments in the regions larger firms and institutions and provides tailored and reactive business advice which stimulates entrepreneurial interest at the earliest opportunity and encourages SMEs to continue to seek advice throughout their first three years of operation".

Observations:

The BIC serves an immediate catchment area wherein the population is estimated to be 1,500,000 and there are approximately 30,000 SMEs. The BIC, reports that it 'home to 156 companies with a collective turnover of £40million+ and has, in the last 10 years (as measured on November 10, 2004), supported 2,053 companies with a combined turnover of £300million'.

Accommodation for start-ups AND growing AND existing businesses:

The BIC services a broad client base (on and off site) which is not restricted to tenant businesses. Further, the BIC is not unduly fettered vis-à-vis entry criteria that prohibit existing or established businesses from becoming tenants (provided they can demonstrate innovation within their business). As observed in the previous chapter incubators constrained to support only start-ups are by their very nature more vulnerable to cash flow difficulties as a consequence of 'churn', i.e. it is more likely that there will be business failures amongst this category of business than more established businesses. Consequently, incubator

management may suffer from a lack of security re revenues derived from tenants i.e. established businesses and businesses which may be accommodated on site as they continue to grow support cash-flows (re rental income) and thus the tenant portfolio/revenue stream is not so precarious/at risk. Furthermore, the BIC has successfully persuaded a number of regional/public agencies to locate at the site, most notably Business Link and TWEBLO which are significant not only in financial terms (as tenants re a source of income) but also insofar as this physical co-location reinforces their working relationship. Further, both have access to funding streams and hold remits that the BIC (for and without a consideration) assists as both a partner and/or as their agent/contractor.

Table 4.4: NEBIC Income

Public Sector Income – subsidies	**Euros**	**%**
From national, regional, local bodies	0	
EU structural funds (e.g. ERDF, ESF)	300000	6.59%
Other public subsidies	200000	4.40%
Public Sector Income - Programme or project management	**Euros**	**%**
Public income through national & regional programmes	0	
Incomes from EU programmes (FP6, INTERREG, etc.)	0	
Income from client-SMEs/Entrepreneurs	0	
Other public income	0	
Total of Public Sector Income	**500000**	10.99%
Private Sector Income	**Euros**	**%**
Income from client-SMEs/Entrepreneurs	300000	6.59%
Other private income (service contracts)	700000	15.38%
Private sponsoring	50000	1.10%
Total of Private Sector Income	**4050000**	89.01%
Total Income	**4550000**	100.00%

While SMEs are naturally a core client, so too are public and quasi-public authorities with an enterprise and latterly educational remit, concerned with developing a creative, entrepreneurial culture in the region. As may be observed from the above, the BIC received (in the last financial year) £500,000 (10.99% of all income) in the form of subsidies, 60% of which are destined to disappear as the structural funds are re-profiled post 2006 to accommodate the new European accession states. However, as noted above, 89% of NEBIC's income is independent of subsidy and is classified as private sector income of which 65.93% is derived from the accommodation/incubator services 6.59% from client SMEs/Entrepreneurs effectively buying BIC consultancy and 15.38 from other service contracts (with public and quasi public agencies and private sector enterprises). Clearly the scope and scale of the facility re the return on the asset value (property portfolio) is significant and it would appear that levering and targeting grants to support the development of the property portfolio and infrastructure has been (and will remain) key to assuring the BICs financial viability and independence and providing a base for all other operations/services.

Grant Funding:

The BIC has been particularly adept at attracting/levering grants (European, National, Regional and Local) to support development and delivery (capital and revenue). For example, the apparent success of the incubator in Phase IV and the subsequent allocation of space and IT kit to support e-business (via the E-business foundation) prompted the BIC to pursue and secure capital funding £1.17million for Phase VII from One NorthEast, ERDF from Government Office for the North East (GONE), SRB funding from Sunderland City Council and funds from the Internet incubator fund. Furthermore, the BIC has levered a range of grant and investment funding from within and outwith the region which has included, for example, ERDF in the order of £240,000+ p.a. to support tenant businesses and the range of services offered e.g. by the Product and Process Development Unit (see also income statement above).

The BIC has clearly seized the opportunities presented by the EU structural funds to support the development of the property portfolio as a basis for the

financial sustainability of BIC operations though as indicated by a retired member of the executive management team, in the beginning not all incubator managers were agreed that property should form an integral part of the model. However, the availability particularly of structural funds (ERDF) and the apparent success enjoyed by those that secured property and with it an air or degree of permanence seemingly conferred by their physical assets was instrumental in changing this view and particularly within the BIC movement.

Quality Standards:

As essentially an SME seeking to be considered for public service contracts, the BIC has ensured that it has attained and maintained recognised quality standards - IiP and ISO 9001 accreditation - which feature with increased regularity as a pre-requisite or technical requirement for businesses seeking to enter public procurement service contracts/tender exercises with national, regional and local authorities.

Stakeholder Relations:

While quality standards are doubtless important, track record, reputation and standing within the community of economic and enterprise agencies are clearly critical as is the nature and level of relationships developed by NEBIC with other influential organisations and businesses which accord the BIC legitimacy/credibility and a profile within the regional/local stock of providers of business support, innovation, and incubation service providers. For example, the BIC clearly enjoys a critical relationship with Business Link Tyne and Wear which is cemented by the fact that the organisation is in one of the BIC's 'anchor' tenants. In the UK, the relationship between incubators (particularly BICs) and their local Business Links organisation (and evidently elsewhere in Europe vis-à-vis national/regional equivalents) is clearly significant (see subsequent case studies).

Evidently, being part of the national/regional authority's fabric of business support providers/agents, is clearly critical as a source of revenue (BICs are often

contracted as Business Link agents (and in Europe by enterprise agency equivalents – national, regional and/or local) to provide a range of services that fall within the e.g. Business Link's remit. In addition, NEBIC has clearly earned the confidence of the Government Office North East, attracting financial support since its creation not only for development and expansion of the facility (capital grants) but also services (revenue funding) while the regional development agency has also supported the development of the BIC in financial (grant) terms and with a number of consultancy contracts/commissions e.g. Regional Innovation Services mapping exercise. As noted above, the BIC has also successfully built up credibility and rapport as a provider of services to local authorities (most recently Teesside vis-à-vis the aforementioned incubator study), Universities (Sunderland and Newcastle – the BIC has/is partnering both on a range of projects and/or as a provider of services and/or working in collaboration on joint projects) and College.

The BIC clearly acknowledges and recognises the importance of stakeholders and partnerships within their 'community of interest'. Evidently, as may be observed from the above, the symbiotic relationships (which are sustained by its capability and capacity to deliver programmes, projects and initiatives) are critical to the development and sustainability of BIC operations and have been instrumental in the role the BIC has been accorded in the development of Sunderland Science Park with the University of Sunderland, City of Sunderland Council, One NorthEast, Government Office for the North East and Tyne and Wear Business Link. In addition, the BIC is assisting the University of Sunderland to develop the Bonnersfield site (part of Sunderland Science Park) to house spin-offs from their IT school and Digital Media Centre. The BIC has also been working on a joint venture with the Employment Service with a view to developing/pursing additional contracts in Slovakia, Slovenia and Croatia.

Regional Leadership:

The BIC completed it first year of operation as a stand alone company as recently as 2002 wherein the company's corporate goals comprised a combination of stability and controlled growth. At all times, however, the BIC has been aware and concerned to ensure that it develop a more strategic sense and presence in the

region in order to become a major regional force in the business support arena, - increasingly imperative (now in commercial terms) given:

a. The increased competition for patronage prompted by the number, nature and level of 'new entrants' to the incubation industry. This will intensify by developments in UK (National and Regional) policy (and the attendant funding) re the central role that Universities are now to occupy/have been tasked with as 'knowledge generators' and endowed with equipment and resources to develop incubator style facilities and services.

b. The increased competition for grant funding to finance the provision of services which became more acute throughout the 1990s and will be exacerbated by the impending gradual diminution of the structural funds which will effectively cease post 2006; notwithstanding that transitional monies might be made available. Structural funds have been integral to so many business support/incubator schemes [throughout the region and Europe generally] and particularly the development, growth and operation of NEBIC. The concomitant increase in competition for funds necessitates the development of new services, facilities and markets.

c. The opportunity presented by the number, nature and level of 'new entrants' to the incubation industry. The evolution of (and legitimacy achieved by) the business incubator modality coupled with the fact that regional agencies will come under increasing pressure to be selective or discriminating in their support for incubators (given the diminution of the structural funds and the historic reliance of the incubator stock of this funding stream). The changing financial environment for incubator operations and the expectation/presumption that the regional innovation system/business support infrastructure should evolve as an efficient, cohesive whole (be more than the sum of its parts) provides the BIC with scope to take a lead in assisting, developing or leading this vision (and the attendant benefits that may accrue to those in the vanguard).

As part of the BIC's sustained effort to establish a degree of regional leadership the BIC has sought to extend the geographic base of the business by establishing satellite operations but has, thus far, been seemingly frustrated or has otherwise failed to attract political and/or financial support from the regional authorities. While the North East of England Business & Innovation Centre is (currently) the only BIC in the North East of England, there are now plans (to which NEBIC is party to) to establish another BIC in the north of the region (Northumberland). It remains to be seen whether this project will be developed as a stand-alone BIC or whether as a satellite of NEBIC however early indications would suggest that it is more likely to be the former. In the interim, the BIC has however initiated the development of a sub-regional network of incubators, seeking to develop collaborative projects and services with e.g. the Digital Factory in Bishop Auckland to mention but one.

Image, Branding and Promotion:

Given the aforementioned rate of addition and differentiation with the local/regional incubation 'industry' and competition for patronage, favour and financial support, NEBIC evidently places great stock in promoting achievement and enhancing its public profile within and outwith the incubator community, reinforcing its position/image as a leading provider of business incubation services. Incubator operations are clearly geared to raising the awareness of the BIC and its brand and its regional role. In the period of observation (effectively 4 years) the BICs profile in regional and local media has certainly increased. Methods of promotion now include efforts to target and develop links with the national media, high profile public relations campaigns in regional and local press which represent efforts to develop brand awareness locally, regionally, nationally and internationally but also achievement and work in progress (e.g. project launches) via direct mailing e.g. the Innovator Newsletter (an emailed bulletin with a pan-european and extended regional circulation), regional advertising and promotions, telemarketing, partnering initiatives (Spirit of Innovation, Sunderland Science Park and a range of other strategic and corporate events).

It is perhaps a mark of the BICs success in their endeavour to build brand brand awareness (particularly via the BIC's 'Spirit of Innovation Awards') that the BIC has attracted private sponsorship. Evidently, legal firms are especially keen to involve themselves in BIC/incubator operations as for example one local firm provides a legal forum while a number of others have sponsored Spirit of Innovation Awards. Indeed, a number of incubators have been quick to exploit interest from providers of professional services e.g. lawyers, accountants for whom incubators represent a potentially lucrative fee stream vis-à-vis, for example, commercial, employment law and the even more lucrative IPR and due diligence work accompanying mergers, acquisitions, business sales, technology licensing, stock market/AIM listings, etc. Further, the nature of their interest in NEBIC seems representative of the private sector interest in UK incubation as a whole (coupled with the positive public relations impact derived from their association).

Human Capital:

Human capital (knowledge and expertise) is critical to the provision of comprehensive and flexible incubation and business support services. As illustrated below, 72.02% of expenditure is incurred in connection with the people side of the business (10.29% is incurred on supplementary or specialist expertise).

Table 4.5: NEBIC Expenditure

Expenditure	£	Relative %
Payroll	1,500,000	61.73%
Consultants and external experts	250,000	10.29%
Subsidies to entrepreneurs	0	0.00%
Overheads (furniture, travel, energy, IT, facilities, etc)	380,000	15.64%
Cost of incubator building(s)	0	0.00%
Financial costs (from loans, etc)	0	0.00%
Other costs	300,000	12.35%
Total expenditure	**2,430,000**	100.00%

The BIC has resisted the temptation to dispense with sub-contracting and increase the permanent staff as this resource gives the BIC scope to extend and/or assure variety in its array of specialist services and activities and provide clients (public and private) sector with access to a comprehensive portfolio of skills, expertise and flexible solutions which might otherwise be unduly prescribed by the competencies of personnel recruited to the permanent staff. Moreover, given the current uncertainties in the financial environment (and that extending the BIC's liabilities by appointing additional permanent staff might be 'unwise'); and the fact that a great deal of funding is project specific, this 'matrix' style of management sourcing expertise from a supplementary pool may in fact be a model that will become more common by necessity.

Client Satisfaction:

The BIC keeps services and activities in a constant state of review, conducting annual tenant surveys and invites tenant and client feedback vis-à-vis service development and the development of new facilities.

Service Development: Challenges

The BIC is itself an entrepreneurial business, innovating new services and models of delivery (e.g. selected projects and services above). Indeed, given changes in the public funding framework and policy focus necessity may prove to be the mother of invention for incubators throughout the region and the UK. Historically, and in the main, the majority of successful start-ups at the BIC (as noted above) are observed as comprising / set up by individuals who are 40+ years of age with senior / middle management experience who readily accept that more than a nine-to-five commitment is required. These individuals tend to have a level of business skill, people management skills and technical expertise that must be underpinned by support in generic business areas. The majority have entered the BIC with a process, service, idea or method of production as opposed to finished product and are noted for their willingness to invite criticism from the support staff and to seek and take advice. They possess, by virtue of their experience, developed interpersonal skills and a level of credibility with suppliers and

customers. They also tend to have established networks of potential collaborators and more importantly start-up capital (derived from severance payments, early retirement/retirement lump sums, etc) that has rendered them financially 'secure'. This group of owner managers have in many cases achieved, what might be considered, a high standard of living that they wish to maintain and better. To that extent peer or social pressure to succeed has also been observed as an important driver in their success.

However, as policy makers (setting regional strategic, economic and ultimately funding priorities) look to enlarge the scope of incubator operations to support, for example, University spin-offs, graduate start-ups (university and colleges) social enterprises, so the BIC must continue to evolve new approaches, programmes, knowledge and skills i.e. NEBIC will need to develop an understanding or profile of successful (likely to be successful) graduate entrepreneurs, social entrepreneurs, etc, i.e. variations on the current entrepreneurial profile or anatomy which may demand new services, approaches and modes of delivery.

Case Study 2

Coventry University Enterprises Ltd or Coventry BIC

Background:

Coventry University Enterprises Limited or 'Coventry BIC' is a wholly owned subsidiary of Coventry University Higher Education Corporation and is the vehicle through which the University undertakes all commercial, income-generating work for the university is produced. In 1970, Lanchester College of Technology, Coventry College of Art and Rugby College of Engineering merged to form Lanchester Polytechnic. The title of Coventry Polytechnic was adopted in 1987, and in 1992 the institution became a University. Coventry University Enterprises Limited (CUE Ltd) was established in 1992 and was formerly known as Coventry Polytechnic Enterprises Limited (established 1989). CUE Ltd is now the external face of Coventry University for all non-primary purpose activities.

Non-primary purpose involves commercial- related activity, such as: consultancy; contract research; trading; non-award bearing education (for example company training), and other forms of economic regeneration and business support projects.

Mission Statement/Aim(s):

The company's mission statement is stated as follows: "To be recognised by regional, national, European and international bodies as the most effective partner organisation in the region to support innovation and wealth creation through the provision of high quality, high value facilities and services."

Governance:

The Governing Body of CUE Ltd comprises a Board of seven Directors (six male, 1 female with an average (mean) age of 55) from the staff of the University, including the Vice-Chancellor, the Pro-Vice-Chancellor with responsibility for research and consultancy, the Director of the University's Commercial Affairs Department (who is also the Managing Director of CUE Ltd) and three further Directors drawn from the University's Governing Body. The Company Secretary of CUE Ltd is also the University Secretary. The Board is constituted to represent the interests of the University group and its position in the public arena. Members of the Board also occupy similar positions in sub-regional organisations, such as the local LSC, Business Link and CSWP Ltd, as well as regional, national and international equivalents.

Facilities:

Like the NEBIC site in Sunderland, the site occupied by Coventry University Enterprises Limited (Coventry BIC) has an industrial past. The site was formerly occupied by the Deasy Motor Car Manufacturing Company, which took over premises formerly occupied by the Eden Car Company in 1906. The company seemingly went from strength to strength during the First World War and moved into the manufacture and development of aircraft and aero engines (the manufacture of cars at the site resumed in 1919) while engine production also

continued. The company expanded further with a range of acquisitions that include A-V Roe Co and by a merger with Hawker Aircraft. However, rationalisation of the aircraft industry at the end of the Second World War (led largely by the Government) prompted a merger of Armstrong Siddeley and Bristol Aero Engines. In 1959 and 1966 saw the final merger of [then] Bristol Siddeley with Rolls-Royce. Production under the banner of Rolls-Royce continued on this site until 1995 when operations were transferred to nearby Ansty.

The site has been redeveloped as Coventry University's Technology Park, as developed by the University in association with Coventry City Council and Advantage West Midlands formally English Partnerships with financial assistance from the European Regional Development Fund. The Park, which is managed by Coventry University Enterprises Ltd, comprises the TechnoCentre (housing the Innovation Centre (home to 50 self contained units accommodating both new and established businesses), Conference Centre, the Enterprise Centre (a grow-on unit for companies who have expanded beyond the Innovation Centre) and the 'Innovation Village' (an £8million development - financed in part by the regional development agency and private sector sponsors - providing an additional 4220 sq. metres of accommodation for larger companies with accommodation from 131 square metres to 804 square metres). The BIC is also planning to develop a sector-specific design business incubator, which will link closely with the strengths of the University in industrial and automotive design.

Built on three floors spanning 2,100 square metres, the 'Innovation Centre' comprises of 30 entirely self-contained units, ranging in size from 17.3 square metres to 87 square metres and is constructed in a modular manner. Each unit is equipped with telephone ports, computer and electrical sockets, ADSL facilities, ISDN lines and Internet facilities, full access for wheelchair users, car parking provision and 24 hour security. The centre also features a staffed reception, message taking service, secretarial and office services. In addition, the Centre also provides meeting facilities, training and conference rooms, dedicated Conference Centre and auditorium and 100-seat restaurant. The Centre is staffed with personnel providing tenants with on hand advice, help and liaison with local,

regional and national organisations and support in the areas of european funding, research opportunities, marketing, exports and information technology.

The 'Enterprise Centre' was the second building to be built on the Technology Park. The £3 million development - which received over £1 million worth of grant funding from the European Regional Development Fund, provides dedicated accommodation for small and medium sized enterprises. The accommodation comprises units that range in size from 54 sq m to 400-sq m which are offered on leases of between three-ten years. Like the Innovation Centre, it features secretarial and office services and a message-taking service. Each suite is fitted with single-phase electric power, State-of-the-art ISDN/ADSL telephone lines, Cat 6 structured cabling and s secure (accessed by digital keypads).

The site also includes:

- the 'Design Cluster' an additional facility specifically designed to support design and innovation; the development of collaborative relationships alongside the CU-ADAM Lab (Coventry University's Advanced Digitisation and Modelling laboratory); and support knowledge and technology transfer through fostering academic and industry linkages; and
- the Eliot Park Innovation Centre(EPIC) a £7 million project jointly funded by the European Regional Development Fund and Advantage West Midlands providing accommodation for than 40 small and growing innovatory businesses.

Tenant profile:

N/A

Services:

The BIC offers a range of services that include:

- Consultancy support to companies and other organisations (on and off-site) provided through BIC staff and associates and by levering resources from within the University (specialist expertise, facilities and services). Consultancy services also include participation in research projects (including academic and industrial collaborations); business consultancy including supplying personnel (e.g. as secondees) for the duration of a project; development and delivery of courses designed to meet specific training and development needs for industrial, commercial and community organisations; and provision of expertise in the area of funding opportunities, product design and business development.
- Business innovation and technology transfer support. Specifically, the BIC, as a member of the European Union's Innovation Relay Network (representing both the East and West Midlands of England) since 1995, provides business assistance with innovation development, technology audits and technology transfer.
- ICT business support - the BIC is a founder partner in 2WM (the West Midlands e-Portal) and provides a ranger of ICT support to business (e.g. e-business).
- International Trade Assistance including the organisation and delivery of inward trade visits and outward trade missions throughout Europe focussing on trade, technology transfer and innovation development.
- The BIC provides a range of entrepreneurship and business support, range of business support, business incubation and pre-incubation (integral to BIC status) and is working on a range of projects concerned with pre-incubation and virtual incubation.
- The BIC has also developed a range of expertise in the development and management of projects concerned with the (business) application of ICT, innovation, business development and industry-academia collaborations.
- Assisting business to prepare grant applications for research and development funding.

The Conference Centre provides the BIC with the ability to deliver events management services and the BIC reports that it is now a regular provider of events management services to regional and national government departments and is now an experienced deliverer of European level conferences. CUE has, for example, organised and delivered the Entrepreneurial Experts' meeting, annual events (for example the DTI's Innovation Lecture) and conferences for more local audiences (such as the launch of the Regional Innovation Strategy).

Resources: Personnel

As stated in Coventry University Enterprises Limited Report and financial statements for the year ended 31 July 2004 (page 9), the Company has no employees but buys services from Coventry University. CUE Ltd has however assembled a flexible proactive workforce of over 80 entrepreneurs, secondees, and experienced project managers, supported by over 500 academic experts.

Example Service Contracts:

Coventry University Enterprises Ltd is based in and is contracted to manage Coventry University Technology Park comprising 8.1 hectares of land and which provides high quality business accommodation; on site business support and advice; access to innovation and expertise; research and development opportunities via University links. Integral to the offering is the opportunity to develop and accommodate (literally) joint venture collaborative arrangements between academia and commerce in the areas of new product development and training. CUE is also tasked with promoting collaboration and joint venturing opportunities with the University to companies outwith the West Midlands and attracting existing businesses to locate and expand their operations on the Park.

Tenants on the Technology Park and other external organisations are further supported with office services, including document typing, preparation of photocopying (black & white and colour), mailing facilities and survey analysis services (other services that are not normally provided by most Technology Parks including client surveys (online and offline), a personal shopping service, dry

cleaning and mobile phone top-up cards are also provided). Coventry University Enterprises Ltd (CUE) has also agreed in principle to manage Optima (a facility in Warwickshire) and provide both an on-site office bureau and business development services from the Techno Park (subject to adequate external support to meet any short fall in service charge income).

Since the late 1980s, and prior to accreditation as BIC, Coventry University Enterprises Ltd (CUE Ltd) evolved a range of support services to business, academia, research organisations and the public sector (particularly EU oriented services). Prior to BIC accreditation, the company was the Midlands host for UK participation within the EC Comett Programme and first published the EC Information Service – a monthly guide to calls for proposals and tenders for research, training, education and business support from the European Commission and associated bodies. In 1991, CUE established EDIT – European Databases Information and Training – which provided training, workshops, conferences and written reports on all aspects of EU information, and specialising in the EC Framework Programme for RTD.

In 1993, CUE Ltd was awarded the contract to run the EC Eurotecnet Programme National Support Unit and in 1995 was awarded the Midlands Innovation Relay Centre contract under the EC Fourth Framework Programme for RTD, a contract now in its eighth year. CUE Ltd has delivered conferences and workshops on the Framework Programme since Framework Three and continues to collaborate with the EC, OST, DTI, and National Contact Point contractors - IETT, Beta Technology, SingleImage, NPL, NEL, CRL as well as Business Links, RDAs, Universities and Research Organisations in the provision of such events.

In addition to numerous call specific days at venues such as the British Geological Survey and East Midlands Electricity, CUE Ltd delivered a Framework Five road show for the launch of the programme in 1999 including venues in Northampton, Chesterfield, Loughborough, Leicester, Nottingham and Lincoln. CUE Ltd delivered the West Midlands FP6 launch on behalf of Advantage West Midlands in 2002 and continues to deliver regular proposal writing workshops for potential participants. Additionally, CUE provides occasional proposal writing

support on behalf of client companies. CUE Ltd has recently been contracted by the East Midlands Development Agency to facilitate regional SME involvement in the EU Commission's Framework Programme (VI) and prepare the regional businesses to engage in Framework Programme VII. CUE Ltd has contracted to perform the service in collaboration with NJM European, Economic & Management Consultants, Limited (Newcastle) and RTC North Limited (Sunderland) – the Innovation Relay Centre for the North East of England. Prior to this contract award, CUE developed capacity and capability in this area via an INTERREG IIIB programme with partners from France, Spain, Portugal and the Canaries. Called the 'Centre for Innovation and Economic Intelligence' (CIEI) the project was developed to provide a free service to find international project partners/Small and Medium-size Enterprises (SMEs) in EU CRAFT/FP6 projects.

CUE Ltd operates the Midlands Innovation Relay Centre, the local node of a network of 71 centres in Europe (8 located in the UK) containing approximately 250 partner organisations, operating in 33 countries that include Member States of the European Union, much of Central and Eastern Europe, the Newly Associated Countries, Bulgaria, Chile, Iceland, Israel, Norway, Romania, Switzerland, Cyprus and Turkey (generally hosted by established regional organisations (Technology Centres, Chambers of Commerce, University Companies, Regional Agencies etc)) covering the entire European Union and much of Central/Eastern Europe. The Innovation Relay Centre network is the official EC innovation and technology brokerage and technology transfer support service (founded in 1993 by the European Commission), providing companies with access to European partners for technical cooperation, research, licensing, manufacturing and joint venture agreements.

As the IRC for the Midlands (Coventry and Warwickshire, Derbyshire, Herefordshire, Leicestershire, Lincolnshire, Northamptonshire, Nottinghamshire, Rutland, Shropshire, Staffordshire, The West Midlands and Worcestershire) the BIC under this mantle offers a range of additional services that include:

- Support for innovation and technology transfer (Outward Technology Transfer (the export and exploitation of technology from the Midlands to

other regions in Europe) and Inward Technology Transfer (the import of technology into the Midlands to meet the needs of local companies) - assistance is provided with the development of contacts as well as the negotiation of agreements between the providers and receivers of technology;

- Support with the exploitation of research results;
- Promotion of new technologies and innovations across Europe;
- Assistance in finding solutions to technology needs;
- Guidance with licensing, manufacturing, subcontracting and joint venture agreements;
- Identification of partners to develop and implement new technologies;
- Support with negotiating technology transfer agreements;
- Advice on intellectual property rights, patent protection and copyright;
- A technology audit service;
- A technology watch service, comprising 'Technology Offers' detailing technologies that a company or research institute has developed and is interested in transferring to other organisations throughout Europe and 'Technology Requests', the reverse of technology offers, where an IRC posts the technologies that companies and research institutes in its region need;
- Advice and support with the location of venture capital and innovative financing;
- The organisation and delivery of brokerage and partnering events in the UK and across Europe;
- The organisation and delivery of technology transfer missions and events (fairs, exhibitions, etc) in the UK and across Europe; and
- Advisory services: signposting for FP enquiries and applications.

Example Projects (selected):

The BIC, via the M.O.N.T.A.G.E (Meeting Organisations Needs Through Audits, Grants and Exploration) project - partly funded by the European Regional Development Fund – supports SMEs in the West Midlands to engage and utilise regional research and development assets (personnel and facilities) to support

product and process development. The BIC provides regional firms with 'technology/innovation audits'; and 'technology watch service' assisting businesses to identify specific technologies, materials, research expertise, development facilities, etc., to meet their needs.

The 'Atlantech' project, a collaboration between CPIN (PT), EUROCEI (SP), CEIN (SP), and WESTBIC (IRL); is funded by the INTERREG European programme [Atlantic scheme] and Advantage West Midlands. Specifically, the project supports SMEs to identify, assess and select business opportunities by exploring their business and international competitive potential (e.g. via transnational missions, business forums and bilateral meetings); it resources the provision of specialist assistance to support business growth and the development of R&D capability and capacity; support international collaborations (R&D and joint commercial ventures); and the assistance of specialist networks for business innovation and technology transfer (e.g. ebn and IRC).

The CETISME project is an EU funded transnational project, designed to promote co-operation between European SMEs (small to medium enterprises) in the field of Economic and Technological Intelligence (ETI). Again, this project supports regional SMEs with 'technology watch' style services oriented towards the continuous acquisition and systematic analysis of information of strategic value about technologies and their applications and trends, together with Economic Intelligence that also covers information on the market (trends, competitors, regulation, etc) and the economic environment are increasingly becoming approaches used by every kind of company.

CUE (with Trade Partners UK) is also delivering the 'INTERACT project which supports SMEs in the West Midlands to increase their international sales using e-commerce. Training is provided (generally free of charge) for eligible companies in information technology (e-mail, databases, spreadsheets); customer skills (negotiating skills, sales presentations); export documentation (relevant paperwork explained, obtaining docs online); legal matters (making contracts on line, data protection); financial considerations (accounting procedures, use of

relevant software); and logistics (getting the goods to their destination, supply chain management).

CUE is also operating a pilot project financed by the 'Promoting SET for Women Unit' (supported by the Department of Trade and Industry's (DTI) Small Business Service) as part of the UK Governments Teaching Company Scheme to support and encourage women to return to the science, engineering and technology (SET) industries.

Observations:

The BIC reports that over 200 SMEs have been established with the support of the BIC since its creation with "many hundreds of new jobs established and thousands of existing jobs safeguarded".

Accommodation for start ups AND Growing AND Existing Businesses:

Like NEBIC, CUE provides accommodation for start-ups, growing and established businesses. As observed at NEBIC, securing anchor tenants has been instrumental to ensuring the integrity of cash-flows. In this case Marconi were persuaded to take up occupancy in two of the three floors of the original scheme (first phase) with the aim of attracting other high-technology firms to the site.

Grant Funding:

Like NEBIC, Coventry BIC is located in an 'Objective 2' area and has successfully levered ERDF support to support the development of services (revenue funding) and facilities (capital funding). In addition, the BIC has successfully tapped into a range of other national (DTI), regional (Advantage West Midlands Regional Development Agency) and european programmes and initiatives (European Commission COMETT, INTERREG and the European Commission's Framework Programme for Research and Development 'FP6').

Stakeholder Relations:

Like NEBIC, Coventry BIC has invested heavily (time, money and resources) in the development of strategic and commercial partnerships. Like St Johns Innovation Centre (see below), the relationship the BIC enjoys with its University is critical as are relationships with the regional development agency, the DTI and Europe vis-à-vis the Innovation Relay Centre network.

Not surprisingly, a range of incubator activities reflect the close coupling of the BIC and the university. For example, the BIC is co-ordinating the Strengthening Academic and Industrial Links Thematic Network ('SAIL') project with Advantage West Midlands (the regional development agency) designed to support members of the network to exchange experience about academic and industrial cooperation across Europe and put innovation at the top of the regional policy agenda. As part of the European Commission backed Innovating Regions of Europe initiative (and one of one of only fourteen thematic networks funded by the European Commission within the framework of the "Promotion of innovation and encouragement of SME participation" programme), the project network comprises 15 members (participating Regions include: West Midlands, UK; Vaestra Goetaland, Sweden; North-East, Romania; Nicosia, Cyprus; North West, Ireland; Bucharest, Romania; South-East, Ireland; Cracow, Poland; Crete, Greece; Iceland; Lower Silesia, Poland; Stuttgart, Germany; Madrid, Spain; and Upper Galilee, Israel). The project also supports bilateral senior level secondments and regional study tours will involve the key 'movers and shakers' of innovation from the member regions'.

Coventry University Enterprises Ltd has funded the development of a new 3-year (part-time) MBA in Knowledge Transfer and Innovation Management, designed to appeal to individuals in either public or private sector whose job involves the support and promotion of innovation and technological cooperation. The programme is delivered in with the mode of delivery being through blended learning. Eight new "level one" undergraduate modules have been developed. These are being aligned with the AURIL CPD framework established in response to comments made by the Business Interface Training Provision review (2002) and

the Lambert review (2003). Both reviews concluded that knowledge transfer is not only highly people-intensive but also that training provision would be required in order to supply the growing demand for skilled staff in this area, and to increase the skill levels of those already in post. The MBA is further evidence of the 'professionalisation' of the industry and the fact that there are opportunities for members of the incubator community to be part of this vanguard.

Regional Leadership:

The Innovation Relay Centre has been an important part of CUE's portfolio extending the BICs strategic sphere of influence across two English regions (West & East Midlands). While both NEBIC and CUE operate from one physical base, CUE has derived a pan-regional authority/presence from the IRC (which in the North East is operated by an organisation other than the BIC (RTC North Limited a neighbour (and next door neighbour at that) on the same business park).

Image, Branding and Promotion:

The BIC brand is seemingly largely peripheral to the activity of Coventry University Enterprises Limited. The CUE identity/brand and the Innovation Relay Centre brand ('Midlands Innovation Relay Centre') are the brands that appear to feature most prominently in promotional material.

Human Capital:

The Company has no employees but buys services from Coventry University.

Client Satisfaction:

Like NEBIC, CUE places great stock in providing a client focussed service (public and private sector) and quality of service. Like NEBIC, track record, reputation and standing within the community of economic and enterprise agencies are clearly critical as are the nature and level of relationships developed by CUE

with other influential organisations and businesses which accord the BIC legitimacy/credibility and a profile within the regional/local stock of providers of business support, innovation, and incubation service providers and upon which a great deal of patronage (political and financial) rests.

Service Development: Challenges:

Like NEBIC, CUE is also confronted by changes in the funding framework, particularly the loss of structural funds, as sources of capital and revenue. Like NEBIC, CUE derives a substantial share of its income from tenants. CUE is currently embarked on a programme developing additional facilities on site (with the last vestiges of ERDF support) to expand capacity (and thus opportunities to generate revenue from tenants).

Case Study 3

Kent Business and Innovation Centre

Background:

Kent BIC is a non-profit making organisation incorporated within Technology Enterprise Kent, which itself incorporates Kent Technology Transfer Centre, the Enterprise Agency of East Kent and the South East England Innovation Relay Centre (SEEIRC).

The BIC was formed by the consolidation of the Enterprise Agency of East Kent (EAEK) and Kent Technology Transfer Centre (organisations which formed as part of government initiatives in the 1980s) and through the initiative and support of Thanet and Dover District Councils, Canterbury City Council, Kent County Council, national companies with local outlets and local commerce and industry (as reflected in the BIC governance structure).

Mission Statement/Aim(s):

"To generate profitable economic activity in East Kent, Kent and Medway, the wider region and Europe, through support for technology based businesses and start ups and established businesses in the community, in partnership with other local, county, regional and European organisations"[8].

Objective(s):

Subsequently, the BIC has evolved a range of business interests and services which are enshrined in their objectives:

- **Strategic Objective One:** Encourage and support start-ups, micro and technology based businesses that can add value to the local economy and create employment opportunities for local people.
- **Strategic Objective Two:** Co-ordinate provision and management of incubator units for local businesses, including technology based and other high growth start-ups.
- **Strategic Objective Three:** Help foster greater social and economic inclusion in East Kent through encouragement for e-business and innovative business practices, and by providing capacity building support for community economic development initiatives.
- **Strategic Objective Four:** Improve the competitive performance of local businesses through supply chain and supplier development support for key sectors and the innovation supply chain and by encouraging clustering of technology based firms.
- **Strategic Objective Five:** Maintain the long standing reputation for excellence in business support, through the development of systems and the introduction of best practice, to provide an efficient business support network and ensure the financial viability of the company.

[8] Technology Enterprise Kent www.technologyenterprise.co.uk

Governance:

The BIC is managed by 20 directors (all male), comprising representatives of local industry, local authorities and the University of Kent at Canterbury

Facilities:

The BIC operates from 4 locations (James House, Castle Street, Canterbury, Kent CT1 2QD); White Cliffs Business Centre, Honeywood Road, Whitfield, Dover, Kent CT16 3EH; Kent Innovation Centre (a new £3.8 million purpose built facility – funded by Thanet District Council, the South East of England Development Agency (SEEDA) and ERDF- providing serviced incubation space and business support, encouraging the creation and growth of technology and knowledge based companies), Thanet Reach Business Park, Millennium Way, Broadstairs, Kent CT10 2QQ; and R & D Building, University of Kent, Canterbury, Kent CT2 7PD.

The BIC manages 64 workshop units and offices across the region on behalf of the two district councils (Dover District Council and Thanet District Council) and Kent County Council (45 serviced offices on three floors, with power, lighting and wideband data points, for high-tech start-ups and providing tenants, with access to board/meeting facilities, Easy-in/easy-out tenancy terms and car parking for tenants and visitors), Thanet (22 units); Deal (9 units); and Whitfield (17 units and 16 offices) with over 250 tenants on three sites.

Tenant profile:

N/A

Services:

Services may be described, albeit broadly, as comprising the provision of Business Advice, Innovation and Technology Transfer, Enterprise Units, Start-up Services, Skills Development, Community Programmes. Service priorities include:

- Business planning and counselling support to start-ups and established businesses;
- Signposting and referral through Technology Enterprise Kent's network of access points;
- Work with high growth start-ups;
- Development of an Innovation Hub in East Kent;
- Management of Technology Enterprise Kent's portfolio of enterprise units;
- Use of expertise to advise other organisations on management of enterprise units;
- Work with other partners to help establish incubator units for high growth start-ups;
- County-wide management support for the Kent Co-operative Development Agency;
- Capacity building for local community groups as a partner in the Thanet Community Development and Enterprise Consortium;
- Delivering of Community Enterprise Development Projects across East Kent;
- Management of the South East Office of the Regional Supply Network;
- Delivering of Community Enterprise Development Projects across East Kent;
- Management of and participation in a range of initiatives aimed at testing new approaches to supply chain and supplier development activities;
- Continuing professional development for Technology Enterprise Kent staff in line with identified needs;
- Continue to seek new business which will sustain Technology Enterprise Kent's capacity to deliver successful business support services;
- Develop the Technology Enterprise Kent's capacity to deliver services and earn income through E-Commerce technologies; and
- Achievement of Investors in People recognition extended to the whole company by 2002; and
- Maintaining ISO9001 quality standard.

The BIC also operates the Kent CDA (established in 1993 and is a full member organisation of 'Co-operatives UK, a national network of CDAs and co-operatives) and its regional arm, 'Co-operatives South East' to support co-operative businesses, co-operatives, social enterprises and community businesses with free advice and assistance.

The BIC, via Kent CDA, has (and arguably before community enterprise/social enterprise became 'fashionable') undertaken a range of actions to support such enterprises which have included the publication of a self-help guide on how to structure, form and register a co-operative business (funded through the Community Dividend Scheme) which the BIC reports is the only complete booklet in the UK for those considering a co-operative structure for their business.

Resources: Personnel

The BIC employs 17 personnel as follows:

Table 4.6: TEK Personnel functions

General Management	4
Administration	5
Entrepreneurs guidance and support (Evaluation, Business Planning, access to financing, follow-up)	4
EU / national / regional project management	1
Incubator management (rent, common services)	1
Communication, events, animation (e.g. inter-firm cooperation)	1
Training entrepreneurs	1
Total	17

Example Service Contracts:

The BIC has held and/or holds contracts to support the Regional Innovation and Technology Strategies for the South Great Plains of Hungary and Cyprus, and

similar activity (funded by the EC to support a similar programme in Poland) for the Malpolska Region of Poland.

The BIC holds a contract to provide/manage the South East England Innovation Relay Centre (SEEIRC) contract servicing (primarily) technology oriented SMEs, but also PLCs, large companies, research institutes, universities, technology centres and innovation agencies and a contract with KCC to manage the Whitfield Business Centre.

Selected Projects:

The BIC is participating in the European Business Network's (EBN) DETECT-it project a collaboration between 42 partners in 15 countries, in particular 30 Business and Innovation Centres (BICs) including Kent BIC. Akin to a number of projects being operating by IRCs, the project is designed to identify ideas/innovations in the [partner] collective BIC client base for exploitation via the EU's Research and Technological Development (RTD) programmes (Framework VI). The project is also designed to counter the obstacles that confront SMEs and hinder the participation (e.g. inability to identify collaborators, engage with RTD Programme experts (e.g. National Contact Points (NCPs)), and prepare grant applications [that are prepared to the requisite standard] in the areas of IST, Energy and Environment and Food safety and Quality will then be grouped into clusters.

The BIC recently completed 'Aerospace 2004' an event supported by UK Trade and Investment and the South East England Innovation Relay Centre (SEEIRC) which aimed a showcase event for South East based aerospace organizations, and provide them with an opportunity to demonstrate innovation, engage with potential international business partners, promote trans-national technology transfer, and encourage cross-border cooperation between enterprises, universities and research institutes. The BIC reports that the event facilitated 117 face-to-face meetings between technology providers and end users, with participants representing organisations not only in the UK but also France, Germany, Spain, Italy, Finland, Belgium, Czech Republic, Israel and the USA.

The BIC is operating a range of projects as part of the South East Programme of Innovative Actions (SEPIA) that includes:

- 'Brainstorming Innovation Groups (BIG)' – facilitated workshops applying state of the art technology and tools to facilitate creativity and problem solving;
- 'New Enabling Services' (in partnership with The Centre for Research in Innovation Management (CENTRIM) at the University of Brighton, and TVT Business Innovation Ltd based in Oxford and supported by the South East England Development Agency (SEEDA) and the European Regional Development Fund and delivered by three partners) delivering a mixture of hands on support including an innovation auditing process, innovation workshops, innovation strategy days, exemplar visits, and the signposting of companies to other existing support services; and
- 'Connectivity And Bandwidth (CAB)' (supported by SEEDA, the European Commission, Kent County Council, Thanet District Council and East Sussex County Council) improving connectivity of businesses in and around the Thanet to existing ICT facilities and a range of mobile communication devices to the Internet, and entry into broadband technologies. The project provides beneficiaries with one-to-one advice and support to select and implement technology solutions.

The BIC operates a 'Business Development Programme' comprising intensive company visits and the provision of business support and assistance delivered by SFEDI accredited advisors (funded by Business Link Kent). The BIC also delivers Local Enterprise Agency Counselling services (again funded by Business Link Kent) and delivered by SFEDI accredited advisors; and 'BLK Start-Up Kent Workshops – the Business Link's 'Look before you leap' programme uses the modern facilitation process to help would-be entrepreneurs find out about starting a business.

The BIC in partnership with Canterbury City Council, local residents and statutory and volunteer sector organisations is operating the Northgate Community Regeneration, and Herne Bay & Whitstable Coastal Regeneration Programmes established to deliver tangible socio-economic impacts in the target wards.

TEK manages the New Entrepreneur Scholarship (NES) [Technology Enterprise Kent was involved with the initial National Pilot Study as lead contractor covering Thanet, Dover, Hastings and Brighton and TEK has recently also covered Shepway] a programme (funded by the Learning and Skills Council and "free at the point of delivery" and comprising 90 hours of part-time business and personal skills training over 4 to 6 months) in the South East of England designed to assist the communities of East Kent (Thanet –Pier, Ethelbert, Newington, Northdown Park, Cecil, Marine, Central Eastcliff, Northwood, Central Westcliff); Dover (Bucklands, St Radigunds, Town & Pier, Castle, Tower Hamlets); and Shipway (Folkestone Central, St Mary in the Marsh, Folkestone East, and Folkestone Harbour) to set up in business by offering comprehensive part-time, flexible support and finance (beneficiaries of the programme who progress and develop a business plan have the opportunity to apply for support of up to £2,500 for items of expenditure critical to the start-up). Notably, the programme supports commercial enterprise AND social enterprise. The BIC is also delivering the 'Impact East Kent' project will assist disadvantaged people living, working or serving rural communities in East Kent with the preparation of letters, CVs, and other issues surrounding social skills.

The BIC has also been involved as a partner or lead partner in a number of projects and networks funded by the European Commission which include/have included in their number:

- 'Industrial Property Europe' (IP Europe) a project designed to improve basic awareness within the European business community of how the patent and other IPR systems may be used to commercial advantage.
- The 'Retina' project which was developed to enhance the capacity of indigenous SMEs to benefit from Economic and Technological Intelligence (ETI) and facilitate transnational collaboration in RTD.
- The 'Digital Contents Competition' (DICON) a multi-national competition to promote and stimulate business ideas wherein digital content is integral and encourage entrepreneurs to use venture capitalists

- The 'Progress Pack', a project to support the development of the South Great Plains Area in Hungary.
- 'ENTRAIN' - a pan-european study investigating techniques for training entrepreneurs to start up a business

The BIC also operates a Shell Technology Enterprise Programme (STEP) designed to help SMEs and community organisations develop their potential by using the skills of second year undergraduates. The BIC runs a 'Summer STEP' project running for 8 weeks during July/August and a 'Flexi-STEP' (non-summer placement scheme) that comprises anything from 20 working days to a year, full or part time. The BIC also promotes and supports clients to access to DTI Research and Development Grants (formerly SMART Awards) for:

- Micro projects which fund 50% of a project to develop a prototype product or process. The maximum grant is £20,000 while the company must have less than 10 employees);
- Research awards funding 60%-70% of technological and commercial feasibility costs for highly innovative technology product or processes. The maximum grant is £75,000 while the company must have less than 50 employees;
- Development awards – a grant of up to 35%-45% of costs (up to a maximum of £200,000) of development of pre-production prototypes of new product or process involving significant technological advances. The company must have less than 250 employees;
- Exceptional awards (up to 35% of the project cost up to a maximum of £500,000) for projects that are akin to development awards but feature strategically important development work.

In addition, the BIC also promotes and supports clients to access the DTI's 'Investigating an Innovative Idea' scheme, a grant regime that provides 75% of the costs of feasibility studies and the development of action plans (up to a maximum of £12,000); The Princes Trust, supporting young entrepreneurs (18 to 30 years of age unemployed or under-employed) to access low interest loans (upto£5,000), grants of up to £1,500, test marketing grants of up to £250, on-going advice from a volunteer

business mentor and marketing support and specialist advice; Royal British Legion Small Business Loan (in conjunction with the Small Business Advice Office) for those leaving the armed services and unemployed ex-Service people requiring financial help to start their own business; and the South East Grant Advisory Service.

Finally, the BIC is operating a project to train teachers in entrepreneurship. Designed by the BIC in conjunction with the East Kent Education Business Partnership, to respond to changes in the 14-19 curriculum, the project is a development programme offered to local schools to meet the government's Work Related Learning statutory requirements which came into force in September 2004. The BIC reports that the project has received praise from the National Federation of Enterprise Agencies, while all Head teachers in East Kent have evidently signed up to register for the programme for their staff.

Observations:

TEK reports that in the past 12 months it has provided advice and support on a range of issues from starting a business to technology transfer and exploitation to over 1,500 individual entrepreneurs, new business start ups and established companies, while historical impacts are stated as the creation of over 4000 businesses leading to well over 5000 jobs. Further, TEK reports that recent research has shown that over 70% of its clients (start-ups) are still in business after two years against a national average of 50%.

Accommodation for start ups AND Growing AND Existing Businesses:

Like NEBIC and CUE, TEK provides accommodation for start-ups, growing and established businesses. Like CUE, TEK enjoys a particularly close relationship with its local university (where the base of the operation is located), however unlike NEBIC and CUE, TEK has developed and/or manages accommodation at multiple sites. Evidently, TEK is also seeking to extend this property portfolio and at an additional location insofar as it considering the feasibility of converting Deal Barracks into enterprise village.

Grant Funding:

Located in the South East region of the UK and considered to be a relatively prosperous part of Europe, there is nevertheless, diversity within the region leading to disparities and areas of severe deprivation. Thanet qualifies for Objective 2 funding to support economic regeneration (wherein the BIC has established an office), while Leader+ is available in mid-Kent to support sustainable rural development programmes. In addition, INTERREG IIIa funding is available throughout Kent to support cross border projects aimed at economic and social cohesion and INTERREG IIIb and c (in Kent/Surrey and East Sussex/Thames Valley/Hants and IOW) for projects involving transnational and interregional co-operation. Like other BICs, TEK has levered a range of EU funds and resources (capital and revenue) to support business development and the delivery of incubator/business support services

Quality Standards:

As essentially an SME seeking to be considered for public service contracts, TEK like NEBIC has ensured that it has attained recognised standards e.g. ISO 9001 accreditation which features with increased regularity as a pre-requisite or technical requirement for businesses seeking to enter public procurement service contracts/tender exercises with national, regional and local authorities. In addition, TEK has achieved 'Matrix' accreditation to provide information, advice and guidance services to those looking for work, training or business start-up and has been awarded a contract from the Kent Guidance Consortium to offer advice and guidance sessions.

Stakeholder Relations:

Like NEBIC, and Coventry BIC, TEK has invested heavily (time, money and resources) in the development of strategic and commercial partnerships. Like St Johns Innovation Centre below, the relationship the BIC enjoys with its University (TEK's collaborations are not in the University of Kent's Institutional Plan 2003-2006 (published July 2006, page 14) is critical as are relationships with

the regional development agency (SEEDA), Kent County Council, Medway Council, the Canterbury City Council, the Canterbury District Economic Partnership, other HEIs/FEIs in the region, the Learning Skills Council, Business Link Kent and South East Economic partnerships.

Regional Leadership:

Like NEBIC and CUE, the BIC recognises the importance of playing a proactive role in the development of an entrepreneurial culture and business support services. Like CUE, TEK operates the region's Innovation Relay Centre and in so doing also derives a regional sphere of influence from this competency.

Image, Branding and Promotion:

Like NEBIC (above) the BIC also operates an awards scheme and event 'The Gala Awards for Excellence Ceremony' (in collaboration with The Kent Learning Partnership) to highlight the achievements of local companies, training providers and individuals recognising examples of good practice. Like NEBIC, TEK has attracted a range of supporters and commercial sponsors who include in their number Barclays Bank Plc; Bank of England; Burgess Hodgson; Canterbury City Council; Dover District Council; Folgate Risk Solutions; George Wilson Group Plc; HSBC Bank; Lloyds Bank plc; Natwest; fizer Ltd; Thanet District Council; and the University of Kent at Canterbury. Like CUE, the BIC brand is largely peripheral to the main TEK brand which incorporates Kent Technology Transfer Centre and the Enterprise Agency of East Kent, the BIC and also the South East of England Innovation Relay Centre.

Human Capital:

Of the BICs 20 Directors (see above), it is observed that 19 of the 20 are male. The balance or rather under-representation of females is stark and this observation (i.e. which first came to light in the preparation of the TEK case study) prompted a review of the composition of BIC management in the other case studies (see above and below).

Client Satisfaction:

Again, client focus (public sector and private sector stakeholders) and businesses tenants and enterprises located outwith the BIC is considered key.

Service Development: Challenges

The BIC has pursued quality accreditation to support the development of an extended range of services which like NEBIC's 'Big Ideas Centre and Programme' encompass the education sector (enterprise training programmes to both school staff and pupils). As noted above, the BIC operates the Kent CDA to support co-operative businesses, co-operatives, social enterprises and community businesses with free advice and assistance. The BIC, via Kent CDA, has (and arguably before community enterprise/social enterprise became 'fashionable') undertaken a range of actions to support such enterprises. In the UK and elsewhere governments and regional agencies are according the development of social/community enterprises increased political importance and thus the funding initiatives being created to support this vision look set to assume increased importance for BICs looking to extend their array of services, client base, sources of revenue and regional influence.

Case Study 4

St Johns Innovation Centre, Cambridge

Background:

The BIC developed and established by St John's College, at the University of Cambridge from which it takes its name, is located on the 'Innovation Park'. St John's Innovation Centre opened in 1987 and has, since that date, offered tenants flexible office and workshop accommodation (easy-in/easy-out tenancy agreements), communal facilities (conference rooms and restaurant) and provided a range of business support services.

Cambridge has developed (since the 1970s) an international reputation for high technology research and development. The 'Cambridge Phenomenon' as it has become known (the incomparable growth of high technology businesses in the Cambridge area which is generally attributed to the University) is a case study in economic development (engineering a technopole) the world over. Prompted by the development and diffusion of Science Parks in the USA, St Johns College was prompted to establish the 'Innovation Park', and more particularly, the Innovation Centre which was established in 1987 (on an 8 hectare plot owned by the College since 1534 and comprising a 2,800 sq.m building and 41 units ranging from 20-120 sq.m in size) and was extended in 1994 to incorporate a restaurant and conference facilities).

Like the North East of England BIC it has been established in a number of phases (5); phase 2, Dirac House (a 2,300 sq.m extension to the Innovation Centre), was completed in July 1989 and phase 3, the Jeffreys Building (3,100 sq.m) was completed in February 1990. Phases two and three were established specifically to accommodate more 'mature' tenants, further along in the business development cycle. Facilities on the park were extended in 2001 with the completion of the Vitrum and Tality Buildings. Integral to the SJIC model is the layout of the facility which includes a generous communal space while each floor is laid out as a 'street' that allows tenants to 'shop' for services from fellow tenants.

St John's Innovation Centre has been financed almost exclusively by St. John's College of the University of Cambridge – reputedly the second richest College in the University –a major landowner with a reported income from its investment portfolio of around £6 million per annum.

The College, an educational charity with a legal responsibility to ensure that its investments produce commercial returns, applies entire rental income from the Park to support activities in line with its core objectives such as Fellowships, Bursaries, College Library and other educational purposes. To further develop and sustain activity on a commercial basis the College established a management company, 'St John's Innovation Centre Ltd' in [DATE] to provide:

- a supportive environment for tenant businesses by providing quality, cost-effective services.
- an environment in which technology transfer and innovation are promoted to assist small and medium-sized businesses at a local, national and international level.

In 1995, St John's Innovation Centre Ltd was accredited as a Business Innovation Centre (BIC) by the European Commission and is a full member of the European Business and Innovation Centres Network (EBN). The Park has been a member of the United Kingdom Science Parks Association (UKSPA) since 1987 and United Kingdom Business Incubation (UKBI) since 1999.

Mission Statement/Aims:

SJIC aims are stated as follows, namely, to:

- Support the development of Cambridge as the catalyst to enable the East of England to become one of the top 5 regions in Europe within the next 20 years in terms of GDP,
- Develop, retain and attract world class businesses where we have a comparative advantage.
- Focus on scientific and knowledge based businesses but we must ensure that the wealth created is spread to all parts of the community and where possible all parts of the region

In this context St John's Innovation Centre's aims to assist and support the formation and growth of early stage knowledge based businesses by providing physical space and in-house management support.

Governance:

SJIC is managed by seven directors (6 male, 1 female), with an average age of 49.75 years.

Facilities:

The Innovation Centre has a total net usable space of approximately 85,000 sq. ft. over two buildings, housing around 65 companies employing over 500 people. Over a five year period the survival rate for companies is over 88%, compared to about 50% for other similar businesses in the Cambridge area, and 45% for businesses generally in the UK. The SJIC offers a range of facilities. Specifically, business accommodation is offered at three levels, which include:

- A segmented rent-address service (similar to NEBIC's Virtual Office space) called the Star Service, which provides a business address, telephone, fax and post handling plus access to other SJIC facilities to 'qualifying businesses' that desiring an Innovation Centre 'office' but are unable to take up residency on the Park. The SJIC's 3 Star service (£6+VAT per week) includes a business address on the site , post, parcel and fax handling, the use of fax, photocopier, document binding etc, hire of conference rooms, meeting rooms and boardroom at preferential rates and free access to the business support services of the Centre. The 5 star service (£13 + VAT per week) also includes use of a communal telephone line and all associated message-taking facilities while the 7 star service (£25 + VAT per week) features a client specific telephone number which can be forwarded or answered by SJIC staff but in the name of the client business (and take messages).
- SJIC also provides hot-desking facilities which may be hired by the hour, day, week or month (at a cost of £5 per hour or thereafter by negotiation). Hot-desking facilities are available 24 hours a day and provide users with use of desktop computer running Microsoft Office XP Professional, broadband Internet Access, advice from the Innovation Centre support team., use of SJIC's cafeteria, meeting rooms(free), conference rooms (at tenant rates) and telephone access (on a pay when used basis)
- Secure business units (office or workshop accommodation – from 10-500 square metres) offered with easy-in/exit terms (offered for up to three years with the option to break on one month's notice). The units feature:

- Direct-dial telephones from a central switchboard
- Broadband internet access
- Individually monitored and controllable security and central heating systems
- Hot and cold water and kitchenette facilities
- Access panel ceilings and flooring
- 24-hour access
- 24-hour security
- Three-phase electricity supply
- Fire detection/smoke alarm systems
- Goods access via individual loading bays (ground floor units only)
- Most of the units are air conditioned.

Tenants are also provided with a wide range of services, some of which are provided under the leasing agreement and others which are subject to additional charges:

- Central Reception and Switchboard (staffed from 8.30 am until 5.30 pm)
- Photocopying
- Document binding
- Fax handling
- Post handling
- Furnishing, heating, cleaning and lighting of all communal areas
- External window cleaning
- Refuse disposal
- Management and maintenance of the buildings
- Up-keep of the landscaped Park grounds
- 4 Conference Rooms
- A Boardroom and 5 Meeting Rooms
- Vending machines
- Two, 2-tonne hoists to the first floor
- Electronic security systems, CCTV and night/weekend security patrols
- Provision of comprehensive services allows tenants to concentrate on their businesses without the distractions of non-core, property-related issues.

Tenant Profile:

See Appendix 3

Resources: Personnel

N/A

Services:

The service model may be briefly summarised as comprising:

- Product innovation, design and manufacture;
- Marketing and public relations;
- Corporate design;
- Advertising;
- Human resource development and management;
- Training; and
- Fund raising and other financial services.

SJIC endeavours to act as a catalyst in promoting technology locally, regionally, nationally and internationally. The SJIC delivers free advice to tenants on business issues and supports tenants and non tenants via local programmes (with University Departments and Government Bodies) and supports entrepreneurs to access funding through Business Angel Networks and venture funds. In particular, SJIC is able to provide free networking advice to tenants and makes recommendations on: sources of assistance in the University; product innovation, design and manufacture; human resource management; the availability of bank finance, venture capital, UK and EC grants; marketing and public relations; and training and development. The Centre also provides (on a fee paying basis), administrative services including company secretarial (statutory reports) and accounting (bookkeeping, budgeting) services.

The BIC facilitates transnational technology transfer between SMEs and R&D organisations in the Eastern region on the one hand and similar organisations in the other countries of the European Union, Iceland, Norway and Israel, on the other. This activity is enhanced by the BIC's operation of the East of England Innovation Relay Centre which via the IRC Network of European Centres and member services enables SJIC to identify potentially suitable technology transfer partners. The IRC twinning arrangements which have extended the IRC network to 10 Central and Eastern European countries and the Baltic States has further enhanced this capability. The IRC employs staff at Hertfordshire Business Incubation Centre in Stevenage and at the Norfolk Network offices in Norwich and reportedly assisted East of England organisations to reach almost 30 technology transfer partnerships in the last 12 months.

In addition, SJIC provides information and advice on European grants and the identification of R&D partners for European collaborative projects (an activity which is part financed by the Regional Development Agency). Like CUE Ltd (above), SJIC promotes technology offers from the East of England, technology requests from the East of England and offers from the East of England's Higher Education Institutions. The East of England IRC is recognised as being particularly successful and recently won the award for 'Best Performing IRC' at the IRC Network's 10th anniversary meeting in Brussels

Example Service Contracts:

In addition to providing services on site St John's Innovation Centre Ltd supports the Regional Development Agency (EEDA) and Business Link (Cambridgeshire Business Services), by running programmes for businesses in the region which include, for example, an 'Investment Readiness Programme' - assisting with business planning and fund raising. Furthermore, SJIC holds or has held a range of service contacts that include:

- Advising on Science Parks and Innovation Centre initiatives in the UK and overseas;

- Carrying out assignments for the EU in Economic Development (Italy) and technology transfer (Slovakia, Estonia, Romania);
- Running workshops and seminars on technology transfer, innovation and business development;
- Assisting the Department of Manufacturing and Management University of Cambridge in establishing an Institute for Manufacturing Industry; and
- Assisting the Judge Institute of Management Studies in the establishment of the Cambridge Entrepreneurship Centre.

Selected projects:

St John's Innovation Centre (via the IRC) is one of two UK members of the Europe-wide Gate2Growth Regional Network (supported by the European Commission DG Enterprise - Innovation/SMEs programme) which secures preferential access for SJIC to a web-based brokerage system designed to link entrepreneurs with investment-ready business plans (looking for equity investment of £350,000 or more) to potential investors.

SJIC, since 2003, has operated the Gateway2Innovate programme, funded by the East of England Development Agency, which aims to connect businesses in the region requiring innovation support, to organisations and networks on the supply side that can provide the nature and level of assistance required.

The BIC via 'Enterprise Link', a contract SJIC holds with Business Link for Cambridgeshire, provides advice and support for early-stage entrepreneurial/aspirational businesses (based predominantly, but not exclusively, in the Cambridge area). The project provides for the delivery of seminars and networking events, regular information, advisory and opportunity bulletins and access to specialists and contacts within the Cambridge business community and University. SJIC with support from the Gatsby Charitable Foundation, Cambridge Network Ltd and Business Link also operates 'Skills Link' a project specifically designed to support Cambridge's 'highly qualified' unemployed.

The BIC also operates Innovation East, the regional innovation and technology transfer service for the East of England, whose focus is the promotion of innovation and the transfer of innovative technologies, regionally, nationally and globally. Incorporating the East of England Innovation Relay Centre (EEIRC) and supported by the East of England Development Agency and the European Commission the service provide companies in the East of England to identify and source new technologies, processes or expertise; sell, license or commercialise newly developed technology; and start or join European collaborative R&D projects.

The BIC also operates the 'High Growth Start-up Support Programme' for Cambridgeshire (supported by Business Link); facilitating business starts with significant growth potential or embryonic enterprises that have been running such a business for less than 12 months. The programme provides beneficiaries with an initial diagnostic from which delegates accepted onto the programme will receive £750 worth of vouchers redeemable against master classes, support services and access to a specialised mentor.

The BIC is an agent for the Shell Technology Enterprise Programme (STEP) a UK-wide programme offering penultimate-year undergraduates project-based work during the summer within small to medium sized businesses and community organisations. The STEP programme is designed to support small companies develop their potential by utilising the high level skills of undergraduates. As an agent of STEP, the BIC has a strong track record placing students in local SMEs including the winner of the Electronic Engineering Award at the STEP 2003 National Finals. In conjunction with the STEP student placement programme, SJIC (via the EEIRC – see above)) also runs STEP International, a programme (supported by the East of England Development Agency) for placing students in Innovation Relay Centres elsewhere in Europe during the summer. In a similar vein, SJIC also facilitates a number of **'Student Projects'** per annum and in so doing supports a range of University of Cambridge courses that require students to work in local start-up companies. SJIC co-ordinates (for each university department) identifying, engaging local businesses and persuading them to accept students; and providing information on projects

operated by the Institute for Manufacturing, the Entrepreneurship Centre, Judge Institute and Engineering Department.

SJIC is also partner in a joint venture 'Cambridge Minds' a network of PhD, MBA and MPhil qualified personnel accessible to businesses and individual entrepreneurs seeking such skills for new ventures, interim or project work.

Observations:

Accommodation for start ups AND Growing AND Existing Businesses:

Over 170 firms have been tenants of the Innovation Centre since its inception in 1987. With a high survival rate amongst those firms, their impact on the economy of the Cambridge area has been significant. The Cambridge Judge study of firm destinations found that the majority of movers from St. John's stayed within a 20 mile radius of Cambridge; only 20% had moved out of the area altogether. Most had also grown in terms of employment. There are currently about 70 companies resident on the Park, employing over 1,000 people, with a combined turnover in excess of £40 million per annum. Over a five-year period the survival rate for companies is over 88%, compared to about 50% for other similar businesses in the Cambridge area, and 45% for businesses generally in the UK.

As with other BICs the tenant mix varies and includes, for example, business concerned with or offering product or services connected with biomedicine, energy, the environment, computer/telecoms, industrial technologies, materials and consultancy (technical). In the main, the majority of the activities of the tenant companies fall within the fields of Research and Development, design of new products and services, testing and analysis.

Grant Funding:

SJIC is concerned to point out that the Centre is not in receipt of any direct public sector funding for its core activities and therefore has to take on consultancy assignments to build up its business support team and defray the costs of any expansion of its activities. For example, SJIC secured £300,000 from The Gatsby Charitable Foundation in 1998 in respect of the 'Developing Entrepreneurs' project which SJIC has designed and subsequently implemented:

- To establish and manage a network of early-stage knowledge-intensive ventures and develop an on-line 'Resource Centre' to support such ventures.
- To identify potential knowledge-intensive businesses within the University of Cambridge and to support these firms in the earliest stages of their development.
- To ensure that the University of Cambridge develops appropriate capacity to respond to the emerging needs of early-stage knowledge-intensive ventures.

The project has supported the development of 'Enterprise Link' in 1989 a business network of nearly 200 early-stage knowledge-intensive ventures in the Cambridge area which now comprises 400+ members; the 'Resource Centre for Technology Entrepreneurs' (developed for Cambridge and subsequently rolled-out to Oxford via The Oxford Trust); the University of Cambridge Entrepreneurship Centre (CEC) at the University of Cambridge 'to train, develop and support the people who will make new knowledge-based ventures successful' which in 2003 was reformulated [to reflect two emergent but distinct remits] as the Centre for Entrepreneurial Learning for education programmes and Cambridge Enterprise for support for new venture creation. The project was also instrumental in supporting a number of strategic studies which included 'Funding Technology - Lessons from America'; 'Funding Technology - Israel and the Virtues of Necessity'; and 'The Cambridge Technopole: An overview of the UK's leading high technology business cluster'.

SJIC reports that the 'Developing Entrepreneurs' project has attracted a second grant from the Gatsby Foundation to:

- support the development and management of networking activities focused on knowledge-intensive entrepreneurship
- continue the research and dissemination of understanding on the development of support systems for knowledge-intensive entrepreneurship
- enable new projects focused on the support of knowledge-intensive entrepreneurship to be identified and for resources to be accessed for such projects to be implemented;
- co-ordinate regular meetings of key representatives of the innovation support communities in the Cambridge area to help ensure effective integration of current and future activities.

SJIC with funding from the Gatsby Foundation (and additional financial support from Cambridgeshire Business Services (Business Link)) has also levered additional business mentors from University of Cambridge Enterprise. SJIC provides enterprise-link members with monthly electronic newsletters and approximately 50-60 events per annum. In 2003 the events programme for October and November (2003) comprised: "Survival & Growth in a hostile business climate"; "Internal communications for small businesses"; "Early steps in internationalising your business"; "Specialist adviser day on Intellectual Property"; "Does your web site deliver business benefit?"; "Legal up-date for SMEs"; "EC 'Gate2Growth' briefing"; and "Coaching skills workshop". In addition, the funding has enabled SJIC to continue to research and develop a regional (collective) understanding of the development of knowledge-intensive entrepreneurship support systems and infrastructure.

Stakeholder Relations:

Integral to the SJIC's operation is its relationship with the University of Cambridge. SJIC has been active in the identification and delivery of support to university spin-outs. For example, between 1998 and 1999, pending the award of University Challenge Funding, SJIC assisted the University's Industrial Liaison Officer to identify and support university spin-out SMEs; and via the 'Anglia Enterprise Network' SJIC employed two 'venture scouts' in the University to identify potential businesses (spin-outs), assist in identifying and sourcing additional technical, commercial and management expertise and support fund raising activities. SJIC also supports businesses already established by or in University departments by providing them with e.g. an accommodation address, direct accounting or legal support. In addition, SJIC support the Judge Institute of Management Studies (the University Business School), providing reference material for research and has assisted in the establishment of the Cambridge Entrepreneurship Centre. SJIC also works in partnership with Business Link and the University in assisting embryonic businesses not resident on site. In 2002 SJIC housed 50 businesses in the Centre and worked with around 600 earlier stage or embryonic businesses.

Regional Leadership:

Funding from the aforementioned Gatsby Foundation has supported the production of a number of strategic studies and publications that include in their number: the 'Cambridge Technopole Report', a biannual publication billed as incorporating "revised data to reflect the changing view of high technology business in Cambridge, and to highlight new services on offer; and 'Funding Technology' reports which have investigated approaches to technology development/transfer in the US, Israel, Germany ("Funding Technology – Germany: Better by Design?"), and UK. The latter strand of project activity (above) has also proved instrumental insofar as it has stimulated, nee prompted, the creation of the Cambridge Technopole Group, a network of business support organizations operating in the Greater Cambridge sub-region, comprising:

- SJIC
- Greater Cambridgeshire Partnership
- Regional Infrastructure for Innovation
- Cambridge Science Park
- University of Cambridge Enterprise Knowledge to Value
- ERBI
- Cambridgeshire Chamber of Commerce
- Business Link
- Cambridgeshire Enterprise Services Limited
- University of Cambridge Corporate Liaison Office
- University of Cambridge Institute for Manufacturing
- www.CambridgeNetwork.co.uk

This sub-regional network is committed to improving the range and quality of the business support services available in the sub-region, particularly for companies based on technology. More specifically, the Group aims:

1. To encourage the flow of information on new projects and initiatives between the members of the Group and to work together for the benefit of business customers.
2. To identify the key organisations involved in business support in the Greater Cambridge sub-region for the purposes of accurately signposting business customers.
3. To publicise and explain the origins and growth of the 'Cambridge Phenomenon' in order to attract and retain appropriate new businesses to the sub-region.
4. To identify gaps in the provision of support for businesses, and to lobby for resources to fill such gaps.

While the project has supported publications that contribute to advancing understanding and/of best practice, they have been particularly significant insofar as such actions support and/or reinforce the positioning of SJIC as a key player in the regional (and national and international) innovation/business support system/infrastructure. The project provides a mechanism for SJIC to engage policy makers, business support providers and funders (directly or indirectly) of business support (SJIC) activities. For example, SJIC found itself positioned to

co-ordinate Cambridge's response to Treasury's proposals for the establishment of BICs in the UK. Indeed, SJIC has developed a range of links with national, regional and local business support and innovation networks that include in their number: United Kingdom Business Incubation, Business Link University, Enterprise Panel Steering Committee; Oxford2Cambridge Arc, Innovation East, Cambridge to Ipswich Corridor, i10 (network of HEIs in the East of England); Cambridge University Local Industry Links, and the Greater Cambridge Partnership.

As noted above, SJIC took over the responsibility for running the Innovation Relay Centre for the East of England in 1998, which has enhanced the SJIC model, particularly the technology facilitation and transfer function, pan-european linkages and networks and the ranger of SJIC services.

Image, Branding and Promotion:

In 1995, St John's Innovation Centre Ltd was accredited as a Business Innovation Centre (BIC) by the European Commission and is a full member of the European Business and Innovation Centres Network (EBN). The Park has been a member of the United Kingdom Science Parks Association (UKSPA) since 1987 and United Kingdom Business Incubation (UKBI) since 1999. Like CUE and TEK the BIC branding or accreditation while important to the organisation does not appear to be as central to the corporate identity/image as for example NEBIC.

By virtue of its connectivity with the University of Cambridge and its historic pre-eminent intellectual tradition; its position within the Cambridge Technopole; and the public perception that the SJIC is situated in a location at the heart of knowledge-based industrial and economic development, SJIC finds itself (like MIT in the US) particularly well-positioned to attract patronage from outwith the region (national and international), particularly corporate and scholarly foundations that lie beyond the reach of incubators, particularly incubators not linked to universities and/or leading universities at that.

Human Capital:

The provision of high-valued added services is critical to SJIC's standing within and outwith the business incubation/support community and thus personnel recruited permanent and consultants are considered key to client satisfaction.

Client Satisfaction:

See Human capital above

Service Development: Challenges

Like TEK, above, SJIC is developing a property portfolio and in this case, as a commercial joint venture with START International, a tenant business. SJIC with Start International are offering operational management services in respect of other business and innovation centres and creating investments through property development. To date the portfolio includes properties under management/in development in Bristol central, Bristol park, Cambridge, Chelmsford, Dartford, Edinburgh, Fareham, Harwell, Reading and Woolwich.

Since 2003, the BIC is also an integral partner in 'i10', collaboration between 8 universities and 2 Higher Education Institutions in the East of England developed to improve the interface between the partners and the nature and level of their engagement with business and other organisations through funding, collaboration, facilitation and networking. St John's Innovation Centre's role within i10 is to assist in the development of the ability of the institutions to negotiate and sign commercialisation agreements with companies, and to identify specific opportunities for technology transfer between the institutions and companies from all over the world.

Case Study 5

Hertfordshire Business Incubation Centre

Background:

The East of England Development Agency has placed Enterprise Hubs as one of its 4 priorities in developing the economic strategy for the region. The Hertfordshire Business Incubation Centre's (HBIC) Enterprise Hub, established in 2003 is the first in the Eastern Region. Located in Stevenage, HBIC is funded through the East of England Development Agency (EEDA) to foster a culture of innovation among the regions small and medium sized businesses. Others include Babraham Bioscience Technologies Ltd, in Cambridge and a third to support the development of a third relating to spinning out innovation and products from the NHS in the region. Specifically, the BIC has been established as part of this network of hubs to provide access to office space or other facilities which the new companies can use; recruit specialists who can advise the new companies on key issues such as access to finance, marketing their products and protecting their ideas and intellectual property; and provide networking opportunities for the new companies so they can benefit from best practice and sharing information.

Mission Statement/Aim(s):

"HBIC has brought together expertise in the development of innovative companies and extensive links to corporate and end-user organisations to create an environment buzzing with the opportunity for growth"[9]. HBIC aims to provide Herefordshire and the East of England's business community with a "one stop shop" facility to access appropriate support relating to the needs of high growth companies primarily in three sectors, namely 'Aerospace and Defence Industries'; 'Biotechnology'; and 'Information Communication Industries'. In addition to providing business support, HBIC also reports that it offers flexibly licensed office and workshop space allowing businesses to flourish in an entrepreneurial environment; engages organisations developing ideas seeking new business

[9]Retrieved on 06.07.05 from HBIC website: http://www.hertsbic.co.uk/default.aspx

opportunities for commercialisation; and assists companies through established support networks and well developed industrial relationships.

Governance:

HBIC is managed by 15 directors (all male), with an average age of 55 years. As may be observed from the previous case studies, BICs (in the UK at least), are seemingly largely male dominated enterprises, especially as regards their governance from which it might be inferred that the business incubator/incubation occupation is something of a male preserve. It has been suggested that the current structure of the industry merely reflects the historic organisation of industry and society in general (i.e. more males enter and reach executive positions in industry and/or economic development agencies) however it does beg the question as to whether this seeming under-representation of females involved in the industry and at an executive level is a source of weakness.

Facilities:

HBIC's office and workshops include 77 Individual office units start from 12m² and workshop units range from 10m²- 158m². They feature:

- Easy-in Easy-out License Terms
- Shared Reception Services
- 24 Hour, 7 Days a Week Card Access
- On Site Security
- Parking
- Two Air Conditioned Conference Rooms and 3 Meeting Rooms
- On Site Café
- Postbox Facilities
- On Site Support Team
- On-site Catering
- IT Infrastructure

HBIC also operate 'Chells Enterprise Village (CEV)' at a separate location 4 miles from Stevenage town centre and comprising light industrial workshop units (ranging from 67m² - 126m²) and a unit of small offices varying in size (ranging from 7m² - 19m²).

Tenant Profile:

The Incubation Centre has been established with a specific technology focus, namely Aerospace and Defence; Biotechnology; and Information Communication Technology (ICT).

Resources: Personnel

As noted previously, reviewing the composition of the TEK Board, the HBIC Board is also largely dominated by men; only 2 of the 16 are female. Similarly, only 2 of the 6 members of the executive team are female.

Services:

HBIC's Enterprise Hub seeks to foster, develop, support and promote the development of commercial technology with SMEs, Academia, Research, and Corporate organisations. In particular HBIC seeks to offer/offers:

- Business Incubation [business planning, technology support];
- Access to Funding [Links with Venture Capital Associations, Business Angels and EU Funding];
- Exploitation of new technology [innovation relay centre];
- Targeted training, networking, events, presentations;
- Flexible accommodation and facilities; and Regional, National and International projects to stimulate Innovation.

As regards business incubation and technology support, HBIC offers to work with small and large companies, both onsite at the Business and Technology Centre and throughout the six counties in the East of England. Services to support

growth include assistance in the evolution of development plans; facilitating project development and collaborations, research assistance; technology transfer; seminars, brokering university linkages; management development; and facilitating industry partnerships.

In addition to the business support services available, HBIC also offers assistance in the commercial development of ideas through: Technology Feasibility Profiling; End User Introductions; Commercial Agreement Definition; Project Collaboration Programme; Technology Audits; and a Technology Matching Service.

Example Service Contracts:

The East of England IRC was originally established in 1998 and has hitherto been delivered by SJIC. HBIC is now partnering SJIC providing the Innovation Relay Centre (IRC) services to companies in Hertfordshire and Essex. HBIC reports that in this endeavour it has worked with Anglian Water; Archer Trice; Asymptote; APU; Cambridge University; Cranfield University; Domino Printing Sciences; GlaxoSmithKline; Grant Instruments; Herbert Group; Kecrypt; Keronite; LTH Electronics; Pure Notes; Pursuit Dynamics; Scientific Generics; Sealed Air; Sensopad Technologies; Silsoe Research Institute; TWI; and Vexamus.

Example Projects:

HBIC is currently running a project as part of the NAVOBS programme, an initiative of the European Space Incubator Network (ESINET), supported by the European Space Agency and the European Commission to support SMEs to participate in the Research and Technology Development [RTD] activities relating to the development of innovation services based on space infrastructure, in the fields of Navigation, Security, Telecommunications, Tele-Medical, Tele-Education, Earth Observation and Environment, and Geo-Localisation and specifically as relating to relating to GALILEO, GMES and Space Telecom-based services.

Observations:

It is evident from the participant observation conducted as part of this research and particularly of NEBIC operations (conducted between 2002 and 2004) that the human capital for BICs (and other incubators alike) is a critical resource and has been highlighted as key to their development, success and/or failure. Like a great many knowledge-based micro-sized firms and SMEs (which many BICs are in essence), the fortunes of a BIC are contingent on the expertise, entrepreneurial skill, acumen, personal networks (within and outwith the private sector i.e. public stakeholders and other business support providers) and energy of BIC personnel (especially the founders of BIC during the start-up phase) and their business knowledge, know how, commitment to quality, ability to deliver client satisfaction (SME and also public sector stakeholders), especially at the 'fledgling' stage.

As a relatively new BIC, HBIC has been quick to establish relations within the incubator community. The appointment a former President of EBN and Managing Director of Birmingham BIC, CEO of Aston Science Park, Director of the UK Science Park Association, and Director of the UK Business Incubation Limited, confers upon HBIC a profile and presence within a range of incubator networks and programmes originating from within the incubator/BIC community.

Accommodation for start-ups AND growing AND existing businesses:

HBIC provides accommodation for new starts and existing businesses (in the priority technology sectors mentioned above)

Grant Funding:

HBIC has been established with support from, amongst others, the regional development agency and local authority.

Quality Standards:

N/A

Stakeholder Relations:

As NEBIC is home to a Business Link, SBI and the Herts Chamber of Commerce are tenants of HBIC. HBIC has also, reportedly, evolved a range of partnerships, linkages and networks with for example 'Photonics Cluster (UK)'; the 'Innovation Society for the East of England'; the 'Institute of Electrical Engineers'; the 'Institute of Nanotechnology'; the 'Royal Society of Chemistry'; the 'Eastern Aerospace Alliance'; 'Gateway2Innovate'; 'Hertfordshire Chamber of Commerce'; 'UKBI'; 'ERBI'; 'European Business Network', the 'Innovation Relay Centres Network', 'Medilink'; 'MAS East'; 'REWARDS'; business angels, venture capitalists and other 'Enterprise Hubs'.

Regional Leadership:

HBIC presents itself as "EEDA's Flagship Enterprise Hub, providing EEDA with a model of best practice which we are disseminating to other Enterprise Hubs". HBIC reports that it has advised the Suffolk Enterprise Hub, Essex, and Luton and that it is also working with Babraham Bioscience Incubator (the second East of England Enterprise Hub).

Service Development: Challenges:

As a relatively new BIC, one of the key challenges for the incubator managers is evolve a sustainable business model, manage stakeholder expectations, retain and develop patronage within and outwith the immediate incubator community and continue to invest in business development. Demonstrating achievement, added value and impact is key during this 'fledgling stage' and thus communications strategy and the management of stakeholder relations is particularly sensitive.

4.10 Summary

BIC operations as developed by the 5 incubators studied above have each evolved against a back-drop of different political, economic and industry conditions and are very much a product of regional factor endowments. NEBIC was established at a time when the incubator modality and practice of incubation was relatively unknown and as such the process of obtaining consensus for the BIC initiative in Sunderland was something of a drawn out affair which nonetheless became a physical symbol of a then hitherto fractious and fragmented business support infrastructure evolving a common strategy and goal. This may be compared with the establishment of HBIC in 2003 wherein incubators and incubation is now an established modality, more readily understood by stakeholders and which is generally accepted as a worthy and successful medium for the delivery of business support.

Each of the five incubators studied provide incubation from within (and outwith) a physical environment. While it had been hoped to study a virtual BIC in the course of this study both Pronovus (Nottingham) and BIC SwedenWest have in fact closed seemingly for lack of patronage, financial support or sustainability (i.e. having failed to achieve a level of financial sustainability to the satisfaction of their sponsors and/or in light of competition from new entrants in the industry who have generally adopted the 'physical' model of incubation which has now found more favour than the 'virtual' model).

BICs admit and assist a broad church of enterprises including new and existing businesses, high and low-tech businesses, industrial and service enterprises and other business support providers. As observed above, BICs are also host to social enterprises, charities, and graduate start-ups which have prompted the development of new approaches to reflect the broadening of their client portfolio and the nature of assistance these enterprises require (and the new services and approaches BICs are required to render by stakeholders). BICs are entrepreneurial by their very nature and their capacity to reinvent and renew themselves; developing new services to meet new markets (new social, political and economic priorities) are an undoubted factor in their success/longevity.

Equally, BIC facilities and their business development functions charged with securing grants or investment in the extension thereof and funding and/or commissions to support revenue operations are clearly critical. It is evident that despite the development of private revenue streams and notwithstanding the revenues BICs generate from their tenants, the importance of public funding (e.g. structural funds or an equivalent will remain critical to incubator revenues (see also Chapter 5).

It has also been observed in broadening the scope of incubator operations (and thus incubator revenue streams) it is anticipated that the BICs (and other incubators) will be ever-more required to develop new services, skills and expertise, and alliances. Indeed, as observed above, it is evident that BICs are now working in fields of endeavour and in partnership with organisations as not originally envisaged. For example, BICs are working to develop social and community enterprises and with education providers vis-à-vis developing entrepreneurial cultures and creativity in schools and in so doing have enhanced the range of agencies from which they can derive public funding.

In the same vein, just as stakeholder relations management is increasingly important to the sustainability of incubators, so too is an incubator's public relations function in communicating achievement and success stories which further reinforce an incubator's position within the business support infrastructure and in the consciousness of agencies and individuals with authority and responsibility for policy, economic development and regeneration strategies; and funding for business support projects and/or policy priorities. In a new climate or context for business incubation and incubator operations (as explored in Chapter 5) the ability of BICs to demonstrate added value and impact shall become increasingly important.

However, increased competition for funding (especially between incubators) and the concomitant increase in fiscal pressures that will inevitably follow (in the UK at least) following the re-profiling and allocation of structural funds to the new EU Member States will demand that incubators must become less dependent on public subsidy and/or that competition for public patronage will

intensify. To this end, stakeholder relations management is evidently a critical incubator management discipline as is the task of embedding BIC operations within a regional authority's strategies and plans and as part of the local and regional business support infrastructure and in cultivating support for incubator operations within the business community in order to preserve patronage (largely public but also private) and so as to develop new business opportunities.

It is anticipated that in any event, as competition for public support for incubation becomes more acute, public sector agencies may be required to become more exacting in their evaluation of incubator performance and return on their investment, so as to be more discriminating in their allocation of public funds. Interestingly, in the UK, the decision to transfer responsibility for the regional allocation of ERDF to the Regional Development Agencies coupled with their existing budget for economic development (derived from national government) may now put the Agencies in a position where they wield sufficient influence to compel or otherwise achieve coherence in the provision of business support services and incubator coverage in particular.

Chapter 5: The Added Value and Impact of Incubators

5.1 Introduction

This chapter commences with a review of the context for incubator operations following observations thereof and with reference to interviews conducted with incubator managers and staff and incubator stakeholders. Subsequently, this chapter proceeds to consider the way in which incubators endeavour to add value to their localities and regions with a consideration of incubator rationales, objects, their focus and the nature of services they provide to support innovation and entrepreneurialism.

5.2 General

A limited number of studies conducted over the past two decades have sought to investigate the impact and 'added value' of business incubators and/or the incubation process and to research whether or not incubators are an effective economic development, regeneration or business support modality. Not surprisingly, the 'answers' thus far appear as imprecise as the numerous [research] question(s) formulated in this area of study which are themselves inherently difficult to frame. These difficulties are compounded by the fact that the 'business incubator' – 'business incubation' concept does not readily lend itself to an either an objective or comparative evaluation insofar as incubators and the practise of business incubation caters to so many varied regional specifications and needs; operate in different conditions and locations, have different aims, objectives, purposes and mandates, employ different approaches and operate different business models, notwithstanding significant variations in the nature and level of resources at their disposal.

Moreover, because of the many different types of incubator and the extreme variations in their operating conditions and mandates (which are constantly evolving and morphing – in response to stakeholder and sponsor instructions, market, client and local needs (Kuratko and LaFollette, 1987), political directives, funding priorities, opportunities and/or fiscal pressures, and

the regional specificity associated with each incubator) there is no standard industry model although a number of incubator associations such as NBIA, EBN, UKBI have published best practice guides, benchmarking studies and manuals.

The amorphousness of the model and the various difficulties in establishing a definition of the form has been likened by economic developers and incubator practitioners contacted in the course of this research as 'trying to pin a jelly to a wall' while another, referring to the increasing differentiations of the form, commented on the 'bastardisation of the whole idea' which, regardless of motivation or point of view is a reflection of the fact that the business incubator concept and or the incubation process is a form that is constantly evolving and adapting to local conditions, strategies and plans and/or to fulfil new and different expectations. Indeed, the very process of differentiation and addition has prompted a number of incubators and incubator associations to re-stake their claim as to the ownership of the incubator form and endeavour to establish a fixed, conceptual understanding and definition as to what an incubator is (and is not) – see Chapter 3.

A review of the literature (academic and practitioner), reveals that much of the work undertaken concerned with this subject is descriptive and is dominated by considerations of operational issues affecting the management of incubation schemes (see for example the European Commission Enterprise Directorate General's 'Benchmarking Business Incubators' Final Report (February 2002) and UKBI's National Incubator Study 2000/2001 (Phase Two) or is largely promotional (generated by the incubator community) which while informative and asserting positive effects, is not particularly instructive. There is very little in the way of, for example, investigations concerned with the nature and extent of qualitative and quantitative effects (aggregated or not); and relative or comparative assessments of incubator efficiency or returns on investment.

As regards the former, it may be that the range and/or potential combinations of incubator activities and interventions, i.e. the scale and complexity involved in mapping and describing - never mind evaluating - the multiple dimensions and layers of incubator activity (including intangibles and the

full range of multi-faceted benefits and aggregated effects) has acted as something of a deterrent. As regards the latter, this might be naturally explained by the fact that there has been little appetite or incentive within incubator and stakeholder/sponsor communities to reduce the performance of incubators to such metrics and/or a tacit acceptance that the nature, range and complexity of incubator activities cannot be neatly separated or compartmentalised to support such calculations. It was also observed in the course of this research that incubators are not generally prepared to voluntarily submit or participate in studies (and even studies such as this) that may seek to reduce their operations to uniform metrics unless they can be satisfied that:

- they would not subsequently fall victim to third party agendas or provide stakeholders, sponsors and third parties (especially those with little or no locus-standi but developing an interest in their activities) with a 'stick to beat the them with'; and/or
- such quantitative measures would/could be properly adjusted to account for qualitative factors and effects including local conditions, the scope and differentiation of objectives, focus and other situational variables.

Furthermore, there are inherent difficulties in defining in precise terms - using either qualitative or quantitative indicators (and/or using combinations thereof) - incubator activities (inputs), their application and interpreting individual and/or aggregated effects (outputs). Indeed, even some of the most traditional and widely applied metrics in the evaluation of economic development and/or regional policy and the reporting of incubator performance and impact e.g. 'cost/public subsidy' per 'job/enterprise'; costs relative to improved business performance et al are beset with difficulties. For example, such methodologies and metrics do not account for the fact that the effects may have occurred with or without the intervention/support of the incubator (i.e. they largely presume attribution or causation) and rarely consider additionality or make adjustments for displacement or the actions of other actors in the innovation and business support system (those that do tend to make rather arbitrary assumptions as regards multipliers and or adjustments for indirect effects).

It is evident from discussions and interviews with incubator managers and staff (conducted at the EBN Congress (October 2001), and UKBI events (e.g. UKBI's 2001 National Conference 'Incubating Future Growth: Applying business incubation processes to meet local, regional and national development goals' (12th of November), individual incubator events (e.g. NEBIC Spirit of Innovation Awards 2001-2004, meeting of Loughborough Enterprise Club (5th of May 2005)) that perhaps now, more than ever before, there is a new climate in which business incubation is being delivered in which, increasingly, a 'results oriented' approach to understanding incubator performance is beginning to evolve although a results orientation/reporting of sorts has existed as a condition of structural funds e.g. ERDF Objective 2 (see below) which is generally quantitative by nature. This relatively new orientation is attributed in the main to:

1. A drive to better understand the business incubation phenomenon (particularly amongst stakeholders (economic development managers and agencies), academic researchers and practitioners, especially as regards the nature, scope and scale of incubator activity; and
2. A change in the dynamics of stakeholder/sponsor/incubator relations:
   a. Increased desire to manage/co-ordinate incubators;
   b. An increased desire to validate the incubator modality and the increasing maturity of the industry; and
   c. Change in the level of interest and oversight exercised or sought by stakeholders and sponsors and moreover the personnel that represent them
3. New conditions for incubator operations

1. A drive to better understand the business incubation phenomenon

A number of incubator owner managers have indicated, most notably, that in the last three to five years, business incubator operations, their activities, capability and capacity has increasingly become the subject of varying levels of enquiry and discussion (by academics, practitioners and stakeholders/sponsors throughout the US, Europe and Asia). For the last 25 years despite a somewhat limited understanding of the modality amongst economic developers (for example, pan-european, national and regional government) it has, nevertheless,

been promoted or otherwise fostered as almost an 'article of faith' which some have queried as little more than a "fad" (Lavrow and Sample, 2000) or fashion and "much ado about nothing" (Hulsink and Elfring, 2001).

Increased interest, debate and research has, however, continued to inform our knowledge (if not our understanding) of the incubator phenomenon and/or spawned a number of wide-ranging debates (often semantic - especially with reference as to what 'is' and 'is not' an incubator see also Chapter 3) and has considered for example:

- What is an incubator?
- How have/are incubators developed?

Other research has considered in more detail, incubators operations:

- What life cycle model(s) can be extracted from analysis of business incubators?
- What are the critical success factors for incubators-incubation?
- How does the incubator-incubation concept work in practice?
- How do incubators select incubatees?
- What is the process of new venture development in an incubator context?
- What is the role of planning and the business incubator manager?
- What is the significance of relationships and how do they influence entrepreneurship?
- What factors (and combinations thereof) are critical to incubator success (e.g., settings, networks, founder characteristics, group membership) and the effectiveness of the incubation process?''
- What constitutes a model for a virtual incubator?
- Is the network the location of the incubation process?

The subject of practitioner, stakeholder/sponsor enquires, especially tends to relate to:

- How the incubator works
- What services does it provide
- What services might it provide
- With whom does the incubator work (within and outwith the region/locality)

In general, incubator managers and stakeholders when questioned in connection with the increased interest in the management, operation and effects of incubators, offered a range of observations and explanations for the increased interest and scrutiny:

- A general increased awareness of the business incubator modality (largely a consequence of increased adoption and adaptation) and perception/presumption that the incubator concept is a significant and successful modality which merits/commands attention.
- Increased adoption of the model throughout regions, and around the globe, as an instrument of regional and local economic policy and/or as part of urban and rural regeneration strategies (US, Europe, Asia). Undeniably, the modality has achieved a level of prominence, almost as the 'langue de preference' of government and economic developers (though not always particularly well understood by those who deploy it) and continues to attract interest and financial support. For example, Germany has, as noted above, obtained EU Commission approval to subsidise business incubation and incubated firms directly while elsewhere in Europe business incubation is clearly key to government policies designed to support job and wealth creation, in enhancing and accelerating new firm growth and supporting the transfer of technology and knowledge out from, in particular, the university sector and the achievement of social over economic objectives. For example, a recent speech given by Lord Sainsbury (2003), which speaks of a 'celebration' of the 'progress' of business incubation and articulates the 'value' and 'contribution' which

business incubation can bring to the 'economic and social objectives' of local and regional communities (and the belief that it does so, without detailed exposition); and a belief that 'incubation can play a critical role' in improving the rate of successful business formation. Lord Sainsbury also expresses the general policy consensus that incubation has a very important role to play in regional policy; knowledge transfer from universities into profitable, commercial applications; and that incubation may also focus on 'social rather than economic objectives' and that incubation may not always require physical assets (buildings).

The view that incubators will continue to assume a greater role in economic development strategies and plans is reinforced by the fact, for example, in the UK there are a number of new national policy initiatives aimed at encouraging incubator development, i.e. the DTI's bio-incubator funds, two rounds of the Science Enterprise Challenge, the Regional Internet Incubator Loan Fund, Higher Education Innovation Fund which are augmented by regional resources (single programme and local authority funds). Furthermore, as is evident from profusion of incubator associations and government pronouncements throughout the world as to the importance of SMEs to social cohesion and economic prosperity (see Chapter 2) that the world stock of incubators, as part of SME policy, will continue to increase.

The apparently unfettered rate of adoption of the modality has, however, prompted a number of practitioners and commentators to question whether incubators been built up (too far) into a policy panacea and an all a pervading solution to a range of social and economic problems (see below). In the course of interviews with business incubator managers, stakeholders and sponsors a great many interviewees acknowledged or stated such concerns and the implications this is having insofar as it deconstructs a conceptual understanding of the (original) nature and role of incubators (for good or ill). In any event, the level of addition and differentiation which some perceive as a negative and others more positively (though often with provisos attached e.g. provided there is clarity and mutual understanding as to the nature and level of activity incubators should undertake or are capable of) complicates the challenge for those who seek not

only to understand but also manage or co-ordinate the work of incubators as part of a collective incubator infrastructure.

It was noted in the course of interviews with incubator managers that the number of new entrants adopting or adapting the model or seeking to do so (regional development agencies, local authorities, enterprise agencies, universities, colleges, the voluntary sector, etc) has prompted inquiries in to the nature of incubation (what it is and what it might/should be) within and outwith the industry. Further, as the incubator 'industry' has evolved/matured to now absorb such significant resources and assume such a significant role in economic development policy this has prompted a concern (especially amongst those with responsibility for policy) to better understand the nature and number additions and relative levels of differentiation. The interviews undertaken in the course of this research with incubator managers and stakeholders gave no indication that this initial interest amounts to, or represents, a pre-cursor to a more interventionist approach or endeavour to co-ordinate and manage the deployment of the modality (i.e. 'regulate', 'standardise' or 'quality assure' the industry notwithstanding the work undertaken by UKBI, NBIA and EBN in the production of industry benchmarks), however there is a presumption almost unspoken (and quite possibly valid) that were they [incubators] better understood they might be better co-ordinated and/or influenced and/or supported to co-ordinate their actions and be programmed as part of a cohesive system or infrastructure;

2. A change in the dynamics of stakeholder/sponsor/incubator relations prompted by:

a) Increased desire to manage/co-ordinate incubators

As explained by delegates at the EBN congress in Porto there is evidently increased desire to validate (and/or promote) the incubator modality (particularly, the BIC model); and an increasing desire amongst national and regional government agencies and local authorities/enterprise agencies and incubator funders to better manage or co-ordinate the work of incubators, an initiative the BICs and EBN are ideally placed to facilitate.

There is little to suggest however, that in the early days of business incubation that stakeholders and sponsors of business incubation (e.g. national or regional authorities) evolved detailed strategies and plans for the development of an integrated incubator infrastructure (the degree and extent to which integration can now be achieved is debateable – see below) or one that is as widely differentiated and operating on the scale now observed. Indeed, incubation has seemingly evolved organically, often introduced by stakeholders and sponsors following the observation of the modality elsewhere any which they have subsequently adopted and more usually adapted to accord with local conditions and priorities.

The growth of incubators, which has occurred by both addition and differentiation, and at such a rate, has, as noted above, blurred to some extent understanding and made it difficult for those who might now be presumed, expected or wish to oversee, the development and operation of the business incubator infrastructure and/or exercise any degree of management or control. This is understandable given how incubation has evolved in the last 25 years, promoted and supported across the globe by multiple stakeholders and sponsors and with different ambitions, mandates and resources. The development and deployment of the modality has been anything but uniform and the incubator community is now populated by organisations with a range of business models, levels of institutional independence (legal, political and financial) and resources/support.

However, while conditions (political commitment and funding) continue to foster additions and differentiation to meet multiple and complex needs, in diverse contexts, and for multiple stakeholders (e.g. Regional Development Agencies, Local Authorities, Universities, Colleges and Enterprises Agencies), at any one point in time it remains difficult to work out how many incubators there are and, moreover, the nature, scope and scale of incubator operations (see Chapter 3) to say nothing of their impact or added value. Moreover, the extraordinary rate of development has prompted commentators, economic developers (confronted by an unparalleled rate of diffusion and adaptations of the incubator concept) and members of the incubation community to question:

- Whether the rush to build incubator capacity is a fad/fashion or a reasoned and well-understood response to economic and business needs;
- Whether the incubators within the region's business support infrastructure/forming part of the region's economic development policy compliment or duplicate each other with reference to the nature and level of services they provide, their territorial coverage, their relative expertise and competencies), and whether or not they are in competition with each other for the same clients or resources;
- Whether incubators can justify their existence and are they (BICs) doing enough vis-à-vis the nature and level of services they provide to say nothing of the manner in which they provide their services?
- How incubators are being supported/should be supported (and indeed whether they merit support) and the degree and extent to which they are/can be/can/should be expected to be self-sustaining; and
- The degree and extent to which we risk over-supply i.e. increased capacity without a concomitant increase in incubator capability or demand. The rate of addition and differentiation is perceived by some as being driven by economic developers who merely seek to mirror approaches, capability and capacity as observed in other regions and seek to ensure the development of an infrastructure with regional coverage but with only a limited concern (at this stage) as to the development of a cohesive system.

The latter is a query increasingly expressed within the incubator community (by existing incubator operators (confronted by increased competition – especially for funding and influence), sponsors confronted by multiple and competing requests for support and investment) and outwith the incubator community, especially by those who dispute the political and financial rationales for the intervention and, for example, advocate alternative modalities and further differentiation in approaches. Indeed, these very concerns fuel opinions that incubators, as currently deployed, might be better and more systematically organised and operated as a collective.

Notwithstanding the above, it was explained that in any event, the incubator community, in the main, is relatively devolved and federal by nature

and few, if any, stakeholders and sponsors are now in a position to fully understand and wield influence and authority over the whole (either nationally, regionally or locally). Indeed, those that would wish to do so are confronted by the fact that many (though certainly not all) of the first generation of incubators (established by one or multiple stakeholders and sponsors) have achieved longevity and with it a level of institutional and financial security and independence (legal) and autonomy so that they are not as dependent - as perhaps they once were - on the patronage of one or more stakeholder(s) or sponsor(s), and thus it is more difficult to compel them act in a certain manner or even co-ordinate their work in what is a 'zero-sum game'. A number of BIC and other incubator managers were careful to emphasise that although in many respects 'a zero sum game', many incubators naturally elect to co-operate with each other and that in fact these working alliances enable incubators to present their funding agencies with what they most want – a cohesive business support infrastructure and, in so doing, collectively preserve patronage (political and financial), i.e. the status quo.

b) An increased desire to validate the incubator modality and an increased maturity within the industry

Various studies conducted over the past two decades have sought to determine whether or not incubators are an effective economic development tool and/or a successful modality for the delivery of business support. Although this research into incubator success, impact and effects (largely economic) is limited, such work that has been undertaken has postulated that the modality is:

- cost effective insofar as the average public sector cost per direct job as created by an incubator compares favourably with other programmes, initiatives and intervention (DiGiovanna and Lewis,1998);
- instrumental in assuring the sustainability of businesses assisted i.e. failure rates among incubated firms are lower than comparable non-incubated firms (Campbell et al.,1988; Allen and Bazan, 1990; Fry, 1987; Kuratko and LaFollette, 1987; Lumpkin and Ireland, 1988; Markley and McNamara, 1995; Rice, 2002; Udell, 1990); and

- instrumental in accelerating and developing growth insofar as incubated firms outperform 'comparable' non-incubated firms in terms of growth of sales and employment (Allen and Bazan, 1990); and Culp, 1996).

As with much of the existing such research that has been undertaken including the citations above, much has attracted a range of criticisms. For example, it is suggested that the majority of such work (academic and practitioner) is largely descriptive and fails to explore or acknowledge causality or explain the influence or role of local, regional and national dynamics including, for example:

- The nature, diversity and density of industry (historical and current),
- R&TD specialisations,
- Existence and/or performance of knowledge and technology generators, specifically intellectual assets as originating in or supported by universities, research laboratories (private and public),
- Indigenous physical assets (geography and demographics) and human capital (competencies and skills)
- Other intermediaries
- Culture
- Investment capital
- Government investment (pubic funded research) and purchasing (e.g. Defence Procurement) which supports industry growth, development and R&TD

In addition, another criticism levelled at existing research is that while it is occasionally acknowledged albeit without detailed definition that incubators also generate intangible and indirect effects e.g. improve regional image and community confidence, provide a physical manifestation of national, regional and local political and financial commitments to regeneration, employment and enterprise, the research does little to integrate or evaluate these effects.

Notwithstanding such shortcomings, stakeholders and sponsors are becoming increasingly "results-oriented" (there is evidence that there is a

realization within the incubator community that this is the case) and they and those to whom they are accountable must be satisfied that the modalities they employ to support economic development and regeneration are valid and cost-effective as they are increasingly required to give careful and detailed consideration of the economic rationale for (continued) public investment in incubation (and explain the same) and; more specifically, concerned and interested to determine:

- What incubators achieve and whether incubators achieve what they (and their stakeholders) assert they do
- How business incubation programme outcomes may be evaluated
- Whether business incubators impacted new venture survival rates, job creation rates, industrial innovation rates; and
- The economic and fiscal impacts of an incubator.

It was explained by a BIC manager at the aforementioned EBN congress in Porto that this awareness and acknowledgement from within the industry reflects an increased maturity in the industry wherein incubator managers are acutely aware, now more than ever that not only must incubators be effective they must also be seen to be so (by the communities they serve and especially by those stakeholders and sponsors on whom they rely for patronage and funding) and thus incubators (BICs) must endeavour to engage stakeholders and sponsors and demonstrate how they add value in qualitative and quantitative terms (and with respect to other modalities/organisations that may be employed to achieve similar ends); an endeavour EBN and other incubator associations are keen to support. Indeed, this increasing maturity might also be illustrated with reference to the profusion of incubator associations:

- ADT - Association of German Technology and Business Incubation Centres (Germany)
- AIBI - Indonesia
- AIPyPT - Association of business parks and incubators (Argentina)
- AMIEPAT - Mexico
- ANCES - Asociación Nacional de CEEI Españoles (Spain)

- ANIDE - Columbia
- ANPROTEC - Brazilian Association of Science Parks and Incubators
- ANZABI - Australian & New Zealand Association of Business Incubation
- APSTI - Associazione Parchi Scientifici e Tecnologici Italiani (Italy)
- APTE - Spain
- ASOPARTEC - Venezuala
- ASPA - Asian Science Park Association (Japan)
- AURP - Association of University Research Parks (USA)
- BARDA - Bulgaria
- BASTIC - Baltic Association of Science/Technology Parks and Innovation Centres
- BIAA - Business Innovation & Incubation Australia Inc.
- BIA Europe - Pan-european association
- BICRO - Croatia
- BSBI - Belarus
- Canadian University and College Related Incubator
- CABI - Canadian Association of Business Incubators
- CASTIP - China
- DAICED - Dutch Incubator Association (The Netherlands)
- EBN - European Business and Innovation Centre (BIC) Network
- ELAN - Réseau des dirigeants de Pépinières d'Entreprises (France)
- ESINET - European Space Incubator Network
- FiN - Norway
- FISPA - Finnish Science Park Association
- France Incubation
- FRBIC - Romania
- FTEI - France Technopoles Entreprises Innovation
- IAFIN - Finland
- International Association of Science Parks
- Israeli Technology Business Incubators - Israel
- ISTEPA - India
- JANBO - Japan Association of New Business Incubation Organization
- KABIIC - Kazakhstan
- KOBIA - Korea

- LATPCBI - Latvia
- NBIA - National Business Incubation Association (USA)
- PABIC - Portugal
- PBICA - Polish Business And Innovation Centres Association
- SABACRAC - Slovakia
- SPAT - Taiwan
- SSBDC - Slovenia
- SVTP - Czech Republic
- SVILUPPO - Italy
- Swedepark - Swedish Science & Technology Parks
- SWEDSPIN - Swedish incubators
- SwissPark - Switzerland
- Tecnoparques - Associação Portuguesa de Parques de Ciência e Tecnologia (Portugal)
- TECHNOPARK - Russia
- TEKEL - Finland
- TPIA - Technology Parks and Incubators Association (Australia)
- UBICA - Ukraine
- UKSPA - (The United Kingdom Science Park Association)
- ULBC - Lithuania
- UNIDO -United Nations Industrial Development Organization
- UKBI - UK Business Incubation
- VISZ - Hungary
- VTÖ - Verband der Technologiezentren Österreichs (Austria)

The development and application of technical tools, the adoption of quality procedures and standards (ISO, ENV 14000, IiP), and the development of industry standards and best practice (e.g. the European Commission Enterprise Directorate General's 'Benchmarking Business Incubators Final Report' (2002); EBN's 'VADE-MECUM for Business and Innovation Centres - A good practice manual for the management of Business & Innovation Centres', UKBI's 'Identifying Best Practice: The UKBI National Incubator Study 2000/2001 Full Report' , NBIA's, 'Best Practices in Action: Guidelines for Implementing First-Class Business Incubation Programs'; and the Local Government Association's

'Managed Workspace and Business Incubators A Good Practice Guide for Local Authorities'(undated) to mention but a few). Further, in the UK a benchmarking and standards project has recently been completed by the incubator community (led by UKBI and the national standards setting body, Small Firms Enterprise Development Initiative and supported by the Small Business Service, Scottish Enterprise, the Welsh Development Agency and Invest Northern Ireland to produce 'Quality Benchmarks for Business Incubators' (see below).

c) Change in the level of and/or a maturing interest and oversight exercised or sought by stakeholders and sponsors

Whereas previously stakeholders and sponsors have had what has been described as little more than a 'passing interest' in incubators/incubation and have been satisfied with reported headline results as validation of the modality, there is a sense that this is about to change/already changing. Evidently, stakeholders and sponsors are now increasingly keen not only to develop a more coherent understanding of incubator infrastructure 'as is' but also strategies and plans for its development and - by implication – the resourcing thereof. As noted above, One North East recently commissioned NEBIC to map regional assets i.e. business incubators (capability and capacity) to support innovation. The 'Innovation Mapping Exercise' has provided the agency with an overview of business support services within the region concerned with:

Intellectual Property

- The Generation of New Ideas (e.g. products, services, software, technologies, etc;
- Conceptualising ideas/concepts for public consumption i.e. from "back of fag packet" through to production of professional concept drawings;
- IPR searches (patent, trademark, design registrations);
- Protection (preparing the idea/concept for registration with Patents Office);
- Subsidies (financial support towards the cost of gaining full IPR); and
- Action planning (preparing action list for implementation).

Design & Development

- Technical Feasibility (i.e. can it be done);
- Product Design (preparation of professional designs, detail drawings, visualisations etc of the idea/concept;
- Prototype development (building functioning prototypes);
- Product testing (materials testing, accelerated life testing, etc);
- Design for Manufacture and large scale production (I,e. component design, assembly, capacity planning, supplier lists, factory layout, etc);
- Financial viability (provision of full financial forecasts e.g. cash-flow, P&L, sales projections, etc;
- Funding (grants, loans or equity funds); and
- Government finance (assistance in the grant application process).

Market Research

- Market research on behalf of client;
- Market testing on behalf of client;
- Marketing strategies (preparation of action plans to take product to market); and
- Market launch activities (PR, advertising campaigns, full market launches).

The fact that this and comparable work (e.g. the 'Innovation and Incubation Centre Survey (Innovation Centre Manifesto) carried out for the Alliance Strategic Sub-regional Partnership and the Greater Nottingham Partnership' in May 2005) is now being commissioned by stakeholders and sponsors illustrates not only:

(a) the evident heightened interest in the modality but also;

(b) the fact that national, regional and local authorities (certainly in the UK) have been relatively divorced from practitioner activities and are possessed of only a very limited understanding of the operations and practices - a failing which they now seek to correct; and

(c) the fact that authorities are now beginning to consider/reconsider the nature and level of their approach to business incubation i.e. they may no longer be content (given increasing fiscal pressures i.e. new conditions) to

allow or support incubators operating in anything other than part of a coherent collective.

3. New conditions for incubator operations

In the course of this research, a change in the dynamics of the relationship between incubators and stakeholders/sponsors (and specifically, their representative(s)) has also been observed, prompted, in part, by a change in the conditions in which incubators are now launched and required to operate.

A number of BIC managers who might be described as first generation incubator managers were at pains to point out that many of the first generation of incubator managers possessed unparalleled experience and authority derived from their role, as part of the first wave of incubators, leading stakeholder/sponsor forays into the world of incubation building local/regional capability, capacity, networks (political, technical, etc) and were able to lever financial support on this basis. At the forefront of incubation in their locality, providing a pragmatic 'on the ground' lead in the development of stakeholder/sponsor policies (e.g. regional economic development and business support), this generation of incubator managers seemingly enjoyed a unique position insofar as they were able to develop the modality and attract support and investment in the modality by virtue of the fact that they led and operated flagship, high-profile projects with which a range of local, regional and national sponsors wished to be associated/affiliated. It has been suggested however, in the course of this research, that many (first generation) incubator managers and their incubators are less able than they were before to automatically command support (political and financial) as a consequence of:

(a) the rate of addition which may dilute their pre-eminent position and the funding available,

(b) differentiations in the additions (which may attract funding by virtue of their novelty and the fact that they extend (coverage), and

(c) other 'heavyweight' stakeholders developing their own incubator strategies and plans e.g. universities.

In addition, it has been observed that many of the first generation incubator managers were themselves highly entrepreneurial. Evidently this was/is considered a pre-requisite by the European Commission in the appointment of a BIC CEO[1]), and attracted support and fostered confidence in the modality by the force of their personalities (many possessed a credibility that went with previous commercial success) which was instrumental in the development of high quality trust relationships, political and institutional and financial support. Furthermore, many of the first wave of incubator managers were, it is reported, personally well-acquainted with their counterparts in sponsor and stakeholder organisations and their credibility and/or ability to influence and persuade stakeholders and sponsors to support their schemes was significant.

There is also a perception that the conditions for funding in which the first generation of incubators operated were less onerous (there is a sense that there was more money/aid available and that the basis and competition for funding was less rigorous (there was competition between different approaches but not as much as between incubators). Evidently, the most savvy incubator managers levered funding from multiple sources to whom they offered a range of interventions (this remains the challenge for incubator managers (old and new) and explains in part the level and nature of differentiation). Further, it was candidly acknowledged by a 'first-wave' BIC manager that as regards the first wave of incubators, stakeholders and sponsors were assured (relatively easily) of outcomes in the first instance to which they could point that included:

- the remediation and utility of brown-field sites,
- the creation of landmark buildings,
- the revitalisation of the built landscape,
- a physical demonstration of (and focal point for) policy,
- occupancy and tenant incomes (i.e. the application of entry criteria could be balanced against ensuring the sustainability of the site and in any event

---

[1] GUIDE DES CENTRES EUROPÉENS D'ENTREPRISE ET D'INNOVATION (CEEI), Fiche 4.C 'Recrutement Du Directeur D'un CEEI' retrieved from EU Commissio website : http://europa.eu.int/comm/regional_policy/innovation/innovating/pdf/fiche4c.pdf on 06.06.04

existing businesses with a capacity to pay were attracted by the incubator package which was not necessarily confined to start-ups).

Evidently, stakeholders and sponsors could take comfort from the fact that this and potentially more could be achieved at a cost that could be shared between regional and local communities of interest (and, perhaps more significantly, could be subsidised with EU Structural Funds). This still remains the case, in part, as incubators are presented as a tried and tested approach to regenerating/developing sites that at worst become self-sustaining and at best produce a financial return on the capital investment. However, new approaches to regeneration are attracting political support and new alternative uses for derelict sites and industrial land/buildings that are perhaps more social than economic in orientation and include in their number, for example, cultural developments (e.g. galleries) environmental remediation and restoration of green spaces, etc

However, it also emerged in the course of interviews conducted with incubator managers that there is a sense that business of incubation is increasingly executed in a different environment. The rate of additions has increased the general stock of incubators and has eroded, in part, the pre-eminent position previously enjoyed by the first wave of incubators and the influence they (and individual or pre-eminent incubator managers) have enjoyed. This is not to say that stakeholder relations, and the ability of incubator managers to lever support from stakeholders and sponsors is any less vital, it is merely an acknowledgment that, increasingly, stakeholders and sponsors have their own vision, expectations and targets for the development of incubators and take a more active role in specifying the scope, nature and level of operations that must be delivered as a condition of their support and that they may be more demanding insofar as they wish to see collectivism, networking and engagement across the stakeholder/business intermediary spectrum. In addition, new entrants continue to dilute the level of financial support as may be levered from sponsors and other stakeholders. Concurrently, stakeholders and sponsors are increasingly compelled to develop their own policies, strategies and funding priorities to support how they allocate funds to support incubation and specific incubators.

In the UK and Western Europe, however, much of the funding which these incubators have relied upon and/or enjoyed to establish and support incubator operations including capital expenditure (set-up costs and or expansion, remediation of industrial sites, building, refurbishment of existing buildings, infrastructure – installation of information and communications technology and services, etc) and revenue costs (delivery of services, staff salaries, business support initiatives, etc) - particularly in Less-Favoured Regions of Europe (ERDF & ESF) - is on the wane. Enlargement of the EU will prompt a significant readjustment of those EU funds utilized to address the socio-economic disparities between regions of the EU and support economic regeneration. This will doubtless prompt a scramble for such funding as there is/remains and much politicking by incubators to position themselves for the funding which may or may not replace it (in the UK, Government funding distributed to regional agencies is the most likely substitute, however, many incubators already lever funds from this source already and/or supply services to these agencies). A great many incubators that have historically relied upon structural fund programmes to cover or part subsidise their operating costs are seemingly in for 'a hard-landing'.

Thus stakeholders and sponsors of business incubators will be increasingly required (as the competition for their resources and potential to invest in incubators intensifies for *their* finite resources) to determine and distinguish between those incubators they will and will not support. It was explained by several incubator stakeholders interviewed that regional and local authorities and partnerships are now increasingly concerned to establish, for example:

- 'Where should public investment be targeted in the future to support the development of incubation, business innovation centres and managed workspace?' a question which is part of a long standing debate as regards where investment should take place i.e. should investment be focused in areas that have the strength to capitalise on relatively larger economic multipliers, thus giving a greater return to public investment (see also Calzonatti and Gatrell, 2000) or, alternatively, knowing the difficulties, should investments be made in more rural areas seeking long-term returns

and increased diversification of economic activities in a rural location?); and

- Is there a clear need for integrating the existing and planned business centres and creating a network to support innovative business? and "Is there a need for an accommodation strategy to ensure that investment dedicated to creating an environment to promote innovative businesses is sustainable?" i.e. there is increased pressured to achieve a level of co-ordination and cohesion given fiscal pressures (e.g. withdrawl of structural funds and competition for existing funds as between increasing numbers of incubators (to support their capital and operating requirements) and the numerous programmes, initiatives, and services which they aim to deliver for which they frequently seek financial (public) support.

The increased fiscal pressure in the UK and elsewhere in Western Europe, is evidently mirrored in the US where it is reported that federal and local fiscal pressures are impacting the resourcing of the incubator infrastructure. Dinah Adkins, President and Chief Executive Officer of the National Business Incubation Association recently commented that while incubators are common throughout the United States, NBIA has observed that investments budgets for incubator support are being cut throughout the country, "Every time the economy goes down, so does funding for all sorts of programs...A couple of years ago, many states were in massive deficits, and they used everything they had saved. Now we're seeing budget cuts...I think it's extremely important for incubators to recognize that the nature of the beast is that these public funding sources available in good times tend to dissipate in bad times...Incubators need to operate as much as possible in a business-like fashion"[2].

By way of illustration, it is further reported in Maine's local press, in the US State of Portland, which has - since 2000 - invested $7.7 million in seven incubators ($6.5 million on the acquisition and fitting out and $340,000 in management grants averaging about $48,500 a centre per annum), fiscal pressures have prompted the Department of Economic and Community Development to

[2] Wickenheiser, M. (2005) 'Budget cuts clouding outlook for incubators', Portland Press Herald February 27, retrieved from website: http://business.mainetoday.com/news/050227incubators.shtml

reduce the level of support for the incubator infrastructure, announcing budgetary cuts of approximately 25% and a review of incubator performance.

In an interview with the Portland Press Herald, the Director of the state's Office of Innovation with responsibility for overseeing the incubator system Janet Yancey-Wrona revealed that "The state is evaluating whether or not they've been good investments...The original intent (was to provide) millions of dollars for bricks and mortar, and then small management grants each year to help with operations, but they should be moving toward figuring out how to support themselves".

The article is worthy of note insofar as it reveals that just as in Europe where incubators have historically attracted significant funds, almost as an article of faith, stakeholders and sponsors are now looking to evaluate the 'return' on their investment. This apparent fracture in the relationship between incubators and their sponsors (i.e. a change in the nature and level of sponsor expectations and the way in which they exercise their interest) has prompted a range of reactions from within the incubator community there which reveal a number of reservations as to the nature of incubator evaluation and the metrics that might be imposed to assess their impact and the term over which such evaluations and assessments are made[3]:

- "There should be evaluations of the centres but there should be flexibility in the comparisons, taking into account the locations of each and the needs of the region" - Debbie Neuman, Director of the Target Technology Centre in Orono.

- Any evaluation should go beyond a basic count of tenants and how many companies "graduated" successfully out of the incubator...This is the go-to place, if you're talking about economic development, business development, work force development. We see ourselves as a community resource." - Norm MacIntyre, Head of the Rumford Centre.

---

[3] Wickenheiser, M. (2005) 'Budget cuts clouding outlook for incubators', Portland Press Herald February 27, retrieved from website: http://business.mainetoday.com/news/050227incubators.shtml

- "I don't think that we're doing a very good job supporting these incubators...we're not being very patient...Building an (research-and-development) economy isn't an instant result. It takes years. I'm disappointed, to be honest with you." - Paul Tessier President and Chief Executive Officer of the International Northeast Biotech Corridor, a non-profit economic-development organization and tenant of the Fairfield Centre".

5.3 The 'Added Value' of Incubators: Rationale

Against this backdrop, business incubators seek to add value by offering clients a combination of facilities and services that cannot be so easily obtained from other sources. The nature of these services and the way in which they are delivered, as noted by the European Commission in the 'Benchmarking of Business Incubators Final Report' (2002) will usually have an important influence on the success of incubator tenants and hence the performance of the incubator (p.48). The type and the range of support services provided by an incubator is believed to vary depending on the type of incubator and the objectives of the investors financing it (p.49).

As illustrated above, incubators have been established throughout the world by a multitude of stakeholders and sponsors on the basis of multiple social, economic and cultural rationales. This physical manifestation of policy and evidence of expenditure is an incredibly powerful symbol (and now almost a signature) of economic, cultural and regeneration strategies the world over and the way in which regional and local authorities seek to support and add value in the development of the indigenous SME sector. Indeed, as reported by Allen and Bazan (1990), there is some evidence that business incubation may help regenerate public confidence in the face of the loss of a major employer and overall decline.

As investigated below, local and regional tiers of government concerned with economic development and regeneration have turned to business incubation

as a means of achieving a wide range of national, regional and local socio-economic objectives. Fundamental to the development and diffusion of business incubators/business incubation and the fact that they are now apparently integral to economic development and regeneration strategies are the contributions SMEs make to a region's entrepreneurial culture (Chinitz, 1961) and, more particularly their contributions to innovation and fostering economic growth (Birch, 1987, DiGiovanna and Lewis 1998; Shahidi 1998; Smilor and Gill 1986; and Tornatzky et al. 1996). In addition, it is postulated that SMEs and the nature (product and/or process), level (radicalness/novelty) and number of innovations for which they are responsible supports the creation of new industrial agglomerations, cluster and regional comparative advantages which in turn support wealth creation in the host region (Weber 1929; Markusen 1987, Marshall 1987 – see Chapter 2 above).

In theory business incubation is rooted, according to Hackett and Dilts (2004), in the belief and expectation that incubators will result in more business start ups with fewer business failures (see also Fry, 1987; Kuratko and LaFollette, 1987; Lumpkin and Ireland, 1988; Markley and McNamara, 1995; Rice, 1992; Udell, 1990). In Europe, for example, the role of incubators in the promotion of entrepreneurship, employment and economic growth is widely acknowledged with the 2000-06 Structural Fund guidelines highlighting business incubators as a key instrument of EU regional policy. However, given the rate of adoption and the level of adaptation and differentiation between incubator rationales, there are naturally implications for how incubators are tasked by stakeholders and sponsors, resourced and ultimately judged. As noted by Allen and McCluskey (1990) "Different resources, needs, constraints, opportunities affect incubator missions, policy, services and performance". As illustrated below by Lalkaka (2001) depending on sponsor goals the nature and level of an incubator's endeavour and contribution will be varied:

Table 5.1: Variation in Incubator Sponsor Goals

Sponsor	Desired Goals
Technical University	Innovation, faculty/graduate student involvement
Research Institute	Research commercialisation
Public/private partnership	Investment, employment, other social goods
State sponsorship	Regional development, poverty alleviation, equity
Venture capital-based	Winning enterprises, high portfolio returns

Furthermore, the stated objectives of an incubator may not fully reflect the nature and level of activities.

While Lalkaka's summary (above) has merit, a more detailed review of incubator rationales, mission statements and activity reports and those of incubator associations (e.g. UKSPA[4], UKBI[5], EBN[6], NBIA[7], UN[8], SPICE[9] & AABI[10]) reveals that incubator missions are not so readily condensed or neatly categorised as they are generally concerned to 'add value' or 'impact' local and regional economies in a myriad of areas as illustrated below:

5.3.1 Business Incubator Added Value: Objects

- National, regional and local economic development

---

[4] United Kingdom Science Park Association (UKSPA) http://www.ukspa.org.uk/
[5] United Kingdom Business Incubation (UKBI) http://www.ukbi.co.uk/
[6] European Business Innovation Centre Network (EBN) http://www.ebn.be/content/default.asp?PageID=1&MenuGroup=1&MenuNum=1
[7] National Business Incubation Association http://www.nbia.org/
[8] United Nations Publication, Chapter 7 Strengths And Weaknesses Of Business Incubators, Sales No. E.01.II.E.9, ISBN 92-1-116777-9, page 73
[9] Science Park and Innovation Centre Experts http://www.spicegroup.de/
[10] Asian Association of Business Incubation http://www.aabi.info/aabi_incu/index.html

- Enhancing industrial competitiveness and profitability
- Building or accelerating growth of a local industry/sector(s)
- Wealth creation and concomitant increase in tax revenues
- Remediation and re-use of industrial (derelict) sites and real estate development
- Re-use of redundant (landmark) buildings
- Rural/Urban industrial regeneration, restructuring or development
- Revitalising distressed neighbourhoods
- SME creation and development (and improved rates thereof)
- Retaining businesses in the local economy
- Technology development and transfer
- Innovation and commercialisation of technology
- Supporting the innovation process
- Combating Unemployment
- Employment creation (and safeguarding employment)
- Graduate retention (and/or retention of skilled personnel)
- Providing a supportive environment for entrepreneurs
- Stimulating, mobilising and assisting entrepreneurship
- Enhancing a communities entrepreneurial climate and the value it attributes to entrepreneurship and innovation
- Increased community pride and self-esteem
- Cultural change (Creativity) including entrepreneurship and innovation
- Community development/Empowering disadvantaged communities to develop social enterprises
- Assisting socially disadvantaged groups - such as youth and minorities -, promote niche sectors including music and the arts
- Identifying and supporting spin-in and spin-out business opportunities
- Supporting academic, student/graduate entrepreneurship
- Supporting and promoting the commercialisation of university research and strengthening interactions between university-research-industry,
- Provision of Education and Training
- Research, teaching and learning
- Facilitating institutional linkages (Business-education, Business-Science, Innovation and Research)

- Upgrading the indigenous research base and the technological standing of firms in a given locality
- Expanding and/or co-ordinating the supply of business support services
- Generating Net Income for the Incubator or sponsoring organisation(s), founders and investors
- Supporting indigenous businesses to access finance (including grants) and attract investment including FDI and joint venturing opportunities
- Supporting cluster strategies and plans
- Enhancing vertical and horizontal linkages (within and outwith supply chains), particularly collaboration between large and small firms;
- Promoting national/regional technology, products and services;
- Retaining businesses in the local economy; and
- Attracting businesses to the local economy and supporting inward investment strategies/initiatives.

5.3.2 The 'Added Value' of Incubators: Focus

In general terms, the majority of 'first generation' incubators while focusing on a variety of technologies and combination of light industrial, technology and service firms tend to be what are generally referred to as 'mixed-use' incubators. Subsequently, incubators have emerged targeting particular industries or sectors such as Food Processing, Aeronautics and Space, Ceramics, Arts and Crafts, Life Sciences, Genomics, Bioscience/Biotechnology, Nanotechnology, Telecommunications, and Defence related industries. Incubator sponsors have also developed and targeted the modality (and/or via new programmes delivered from the existing incubator stock) to support micro-enterprise creation, business creation by women, ethnic minorities, rural and other peripheral communities, and new and emerging technologies. In the US, for example, according to NBIA[11] 47% of incubators might be described as 'mixed use'; 37% as specializing in [a] technology; 7% as concerned with manufacturing, 6% as concerned with service businesses and 3% are reported to concentrate on community-revitalization projects or serve niche markets. In the EU the profile of

[11] National Business Incubation Association www.nbia.org/resource _center/what_is/index.php

incubation which has been the subject of an EU Commission study, is illustrated as follows:

Table 5.2: Profile of EU Incubator Activities[12]

Business Activities	Number	%
(1) Sales, marketing and distribution	5	0.4
(2) Business and financial services	8	0.6
(3) Advanced/High tech manufacturing	263	18.6
(4) Information & Communication Technologies	258	18.2
(5) Research & Development	173	12.2
(6) Biotechnology/Pharmaceuticals	201	14.2
(7) Knowledge-based industries / New economy companies	162	11.5
(8) Other Manufacturing Activities	86	6.1
(9) Other Service Activities	124	8.8
(10) A combination of some / all of these activities	134	9.5

In addition, it is evident that in Europe, the US and Asia a number of other sectors, industries (and socio-political priorities) are increasingly entering the incubator mix and becoming an integral element of incubator operations. Just as ICT became significant in economic terms, especially in the late 90s at the height of the dot.com boom wherein a great many new and existing incubators oriented services and facilities (and/or developed new facilities) to support and add value to ICT start-ups[13], now a number of additional sectors or industries are attracting interest from within the incubator community as it seeks to diversify its portfolio of interests, services and revenues (Public and Private) and from outwith the

---

[12] Source: European Commission Enterprise Directorate General, 2002, Benchmarking of Business Incubators Final Report Table 3: What sort of business activities does your business incubator specialise in? Centre for Strategy and Evaluation Services, p.15.

[13] As noted above, the rush to provide incubator support for ICT businesses was largely prompted, in the UK, by stakeholders (regional and local authorities) who as part of their regional economic development strategies sought to engineer ICT clusters, (and provided funding to incubators to further this pursuit (capital and revenue)) and irrespective of regional endowments/potentialities. It has been suggested in the course of this research that a 'lemming-like' pursuit of strategies to develop an indigenous ICT sector/clusters and a misplaced confidence and/or expectation as regards the likely rate of return on investment (which at the height of the dot.com prompted a number of incubators to take equity in tenant businesses as opposed to rental income) may account for a number of incubator failures in the UK. For example, it has been suggested that just as investors in dot.com businesses got their fingers burned by a natural correction in the market so too did a number of incubators.

incubator community as national, regional, local authorities seek to extend their incubators' brief.

For example, and not surprisingly given the political and world context, the US has recently opened its first incubator/accelerator to support and add value to 'Homeland Security' industries. Chesapeake Innovation Centre (CIC), in Maryland has been established with funding from the US National Security Agency (NSA)/Central Security Service[14]. The nature and level of activity programmed for CIC clearly reflects the interest of the sponsor as it seeks to develop partnerships with federal agencies, universities, and LSEs as it seeks to develop new companies in the homeland security/defense, communications and information technology sectors. Aside from the more unusual focus, services included in the tenancies are akin to those generally found in incubators and comprise Coaching and Mentoring; Investor Preparation and Networking, Access to the incubators Resource Network, Entrepreneur Education and Peer-to-Peer Programmes. Similarly, the incubator features industrial partners (e.g. Northrop Grumman Corporation); educational partners (Johns Hopkins University; University of Maryland; and Anne Arundel Community College) and a number of corporate (cash and 'in kind' sponsors).

Elsewhere, in the UK for example, the North East of England's Regional Development Agency has programmed (with some of the residue of European Structural Funds (Measure 2.4, ERDF Capital & Revenue) the development of a number of technology incubators as part of the regional economic strategy and in collaboration with the UK Science and Industry Council. The technology incubators specifically include the New and renewable energy Centre of Excellence (NaREC); a Centre of Excellence for Nanotechnology (Cenamps); a Centre of Excellence for Life Sciences/Bioscience (CELS); a Centre of Excellence for Digital Technologies and Media (Codeworks); and the Centre for Process Innovation (CPI).

---

[14] The NSA "coordinates, directs, and performs highly specialized activities to protect U.S. government information systems and produce foreign signals intelligence information. A high technology organization, NSA is on the frontiers of communications and data processing. It is also one of the most important centres of foreign language analysis and research within the government" http://www.nsa.gov/about/

CENAMPs, for example, has been established as a technology incubator (housed within a 'traditional' incubator (the ATMEL incubator at the Silverlink business park also part-funded by One NorthEast)) by the Regional Development Agency in partnership with the the Institute of Nanotechnology, Universities of Durham, Newcastle, Teesside, Sunderland and Northumbria, NanoMicroClub.com, ICI, Filtronic, ATMEL, Proctor and Gamble, Epigem, Azonano.com, and the Department for Trade and Industry (and the New and Renewable Energy Centre, Centre of Excellence for Life Sciences, the Centre for Process Innovation, Centre of Digital Excellence). The incubator is tasked with supporting and adding value to businesses throughout the region and in multiple sectors that include: Aerospace, Automotive, Biosciences, Chemicals, Computing, Cosmetics, Defence, Displays, Energy, Entertainment, Environment, Fashion, Materials, Textiles, Medical, Retail, Semi-conductor, Telecoms, and Transport.

The incubator which provides a range of 'high-added value' business support services that include facilitating access to public and private investment sources, state-of-the-art incubation facilities, technologists and international networks provides support for research and development; accelerating technology commercialisation; early stage investment; infrastructure development; and provision of knowledge management services to entrepreneurs, researchers, investors and established companies. Other, services include: brokering venture capital access; provision of business/market intelligence; project appraisal; business planning and incubation; business driven research and development; idea generation and marketing testing; product design and prototyping; product testing and acceptance; high-tech manufacturing facilities; value chain design and integration; IP planning and exploitation; training and knowledge development; and technology and project consultancy.

During a visit to the Centre of Excellence for Nanotechnology[15], it emerged that the ATMEL incubator in which CENAMPS is situated, is apparently little more than managed work-space, albeit comprising state of the art accommodation, security and ICT infrastructure and in a prime location (and housed in the building which was formerly built by Siemens to accommodate part

[15] Visited on 16.08.05

of its semi-conductor business - the aforementioned ill-fated inward investment project). However, of the other incubation services that might be expected at first sight of the ATMEL incubator, many of the high value functions (see below) are absent. Indeed, it appears that this incubator like many of the original incubators in the US was established simply to develop a use for underutilized and thus unproductive (in revenue terms) business premises.

Incubators have also been developed and are being deployed to support and bring additional value to regeneration and cultural strategies. For example in the UK, MusicBias, an incubator dedicated to increasing economic growth in Merseyside's music and related industries, particularly for people from groups or communities under-represented in business operates programmes targeting, for example, under 18s in Liverpool & Merseyside to raise awareness of 'benefits and opportunities of self-employment and entrepreneurship in the music sector; and, to provide high quality opportunities for under 18s in Liverpool & Merseyside to progress towards education & training, employment, and venture creation in the music sector'.

Incubators are also being developed specifically to support the development of community/social enterprise. For example, MusicBias includes a 'Social Enterprise Accelerator' designed to "support the development of music and arts-based ventures with the potential to have a far-reaching social impact, particularly among individuals from disadvantaged backgrounds and underrepresented groups". Services include assistance to: develop and refine the business activities; raise finance; bid for contracts; support and improve project management and administration systems; and achieve growth and long-term sustainability. The incubator also offers social enterprises free phone usage, broadband access, fax machines and mailbox service in a Hot-Desk Office environment, as well as IT training and facilities.

Elsewhere, in Scotland for example, the Greater Easterhouse Development Company (GEDC) one of 8 local development companies (formed in 1991) to promote the regeneration of Glasgow most deprived areas has established a Social Economy Team which since 2003 is reported to have provided support and

assistance to over 40 community and voluntary organisations (e.g. co-operatives, community and social enterprises). With a remit to support the development and sustainability of social economy organisations the incubator provides a range of specialist services that include: Organisational Reviews and Business Planning; Health and Transport Programmes; Sourcing and Applying for Funding; Research; Business Planning and organisational reviews; Access to Quality Standard e.g. Investors in People; Development and planning of community initiatives; Business Skills Training for the Social Economy; Management of the Greater Easterhouse Key Fund.

Incubators specialising in social enterprise may also be found, for example, in the US e.g. Social Fusion in San Francisco, Social Enterprises Partnership (Melbourne, Australia), Kent Co-operative Development Agency (Kent CDA, England). As may also be observed from the BIC case studies (Chapter 4), a number of BICs are home to a number of charities and social enterprises.

5.3.3 The 'Added Value' of Incubators: Services

According to Lalkaka, and considering the model business incubator "Counselling, skills development, provision of workspace and networking (internally between tenants and externally with other organizations, e.g. universities, large companies) constitute basic features of the 'package' of services" as provided by incubators. Furthermore, Lalkaka postulates that "assistance is for a limited duration with exit criteria typically specifying that firms should 'graduate' (e.g. in say three years)". Research conducted by the European Commission's Enterprise Directorate General which has endeavoured to establish benchmarks for the industry found a range of exit criteria:

Table 5.3: EU Average Length of Incubator Tenancies[16]

What is the maximum length of time tenants can occupy incubator units?		
Time Period	**Number**	**Percentage**
No maximum tenancy	6	7.7
Less than 1 year	5	6.4
1-2 years	10	12.8
2-3 years	22	28.2
3-4 years	13	16.7
4-5 years	9	11.5
Over 5 years	7	9.0
No response/don't know	17	21.8
Total	78	100

However, as observed from a review of a sample of incubators operating in the East Midlands, evidently 19 of the 31 do not operate an exit policy and thus it might be surmised that the notion of business support for a limited duration 'is a custom more honoured in the breach than in the observance'[17] :

Table 5.4: East Midlands Incubator Sample, Exit Criteria[18]

Facility	Exit Criteria
1. The Bearings	No
2. Boughton Pumping Station	No
3. Chadburn House	No
4. Coney Green Business Centre	No
5. Dunston Innovation centre	Yes
6. Edwinstowe House	No
7. Mansfield Business centre	No
8. Mansfield I centre	Yes

[16] European Commission Enterprise Directorate General, 2002, Benchmarking of Business Incubators Final Report, Centre for Strategy and Evaluation Services, Appendix, Table 36

[17] Shakespeare, W., Hamlet Act I, Scene IV

[18] Source: Alliance SSP Strategic Partnership and independently confirmed by telephone interviews conducted with incubator managers and staff on 28.04.05

9. Markham Environmental Technology Centre	Yes
10. Pleasley Vale Bussiness Park	No
11. Ransonwood Business Park	No
12. E- Centre, Sherwood Energy Village	No
13. Tapton Innovation Centre	Yes
14. Westthorpe Innovation Centre	No
15. Turbine	Yes
16. Bio City	No
17. Blue Coat Incubation Centre NBV	Yes
18. Broadway Media Centre	No
19. Castle Cavendish	Yes
20. Nottingham Fashion Centre	No
21. The Hive	Yes
22. Innovate Office	No
23. Lenton Business Centre	No
24. Mercury House	Yes
25. Nottinghamshire International Clothing Centre	No
26. UNIEI Lab	Yes
27. New Brook House	No
28. Nottingham Science and Technology Park	No
29. S.G.C.S. Business Park	No
30. Southglade Food and Drink Park	Yes
31. Strelley Hall Business Centre	No

Nevertheless the notion that incubators should or ordinarily operate exit strategies persists. In the UK, for example, UKBI's National Business Incubation Framework (2004, p.4) suggests that incubators should operate exit policies which should include "setting a maximum time limits (e.g. three years); stepped rents (gradually increasing each year); incentives to exit; removal of subsidies; [and] setting growth targets which have to be met". Further, from the literature, Brooks (1986, pp.24-29) submits that incubatees should enter an incubator continuum wherein start-ups enter an "economic growth incubator" in order to gain access to the incubator's external support network, shared support services, and the

resources of e.g. the local university affiliated with the incubator and that as they attain maturity should move into a real estate incubator which provides office space and shared services [i.e. services are withdrawn or provided at more commercial rates].

In the course of this research, however, there is little to suggest (as may be observed from the exit criteria operating amongst the East Midlands incubator sample, above) that exit policies are practised with any real vigour. In fact, it would appear that it is normally a case of incubated businesses outgrowing their incubator (i.e. requiring bigger premises) that prompts them to leave over and above anything an incubator 'exit policy' might stipulate.

It is noted however, that many incubators have been prompted to extend incubator accommodation to accommodate for as long as possible growing and maturing businesses thus extending their capacity to tap into what is an important (and potentially lucrative) source of revenue (i.e. as the businesses increase in scale, so too does the rental income that might be derived from them) and which can be used to cross-subsidise other incubator operations and services. Indeed, as incubators reach maturity and extend their capacity (accommodation) this has apparently prompted many to re-define facilities on site so as where previously the whole site may have been defined publicly as the incubator, distinctions are subsequently made on site between small units (space for start-ups and smaller 'new' businesses (however 'new' may be defined)) which are re-designated as incubator facilities and the larger units as 'grow on space' and/or, for example, 'accelerators' et al., for larger businesses further along in the incubation process.

However, while a distinction might seemingly be drawn between businesses occupying the 'incubator' space and thus being 'incubated' and others, this physical distinction is seemingly superficial as in practice larger businesses outwith these smaller units are often still considered as being 'incubated'/accessing incubator services albeit the nature and level of services they receive, access or require may differ which begs the question 'when does/should incubation stop?'.

Again, just as entry criteria are somewhat 'fluid', there is apparently no directive in for example the US, Europe or Asia that stipulates when support should cease (over and above, in Europe, for example State Aid rules which stipulate pursuant to the de minimis threshold, that private sector businesses should not receive more than €100k of State Aid over any three year period, taking account of all state aid that the organisation might receive from any source). However, even State Aid rules seem to have been sidestepped by the EU Commission's recent approval of a German scheme wherein the government will subsidise the provision of incubator accommodation and services to business. At the time of writing the businesses are said not receive the grant directly and consequently the scheme is said not to fall within the scope of State Aid rules and regulations[19].

Notwithstanding, the debate as regards entry and exit policies and, moreover, when incubation should cease, at firm level, the services generally provided by incubators have been investigated variously by, for example, Bearse, 1993; McKinnon and Hayhow, 1998 and in the course of a range of benchmarking studies conducted by national incubator associations). From a review of incubator operations, as stated by incubator associations, national and supranational, it may be discerned that services are generally concerned with promoting and supporting SMEs which includes the provision of incubator units and business support services. The range, nature and level of services and physical aspects (accommodation), however, varies widely within regions and by country due to different traditions, financing models, stakeholders expectations and mandates.

The SPICE Group has identified the following areas where services should be/are rendered (United Nations, 2001), namely: start-up advisory (business planning) and company development consulting; letting of appropriate office, laboratory and/or production space (below market rents, favourable terms); technical and organizational services for young (innovative) enterprises (e.g. secretarial, conference facilities, telecommunication); innovation- and

[19] European Commission Press Release (2005), 'State Aid: Commission endorses German aid scheme for tenants of technology centres and incubators', Reference: IP/05/536; 03/05/2005

technology-oriented services (technology transfer), as well as training and information; and financial services. In addition to the above basic set of services, an incubator can offer a wide range of technology and business community related services, such as: international innovation- and technology-oriented services (technology transfer), as well as training and access to information; market-oriented services (access to information, training, contacts, representation); location in the future market in a flexible manner according to the needs of foreign partners; local, regional, national and global networking, (technical and human).

As noted in the second edition of the United Nation's 'Guidelines on Best Practice in Business Incubation', business incubators do however generally comprise premises (real estate) where national or local Governments, municipalities, or groups of large-scale enterprises provide on-site workshop office and administrative services, and assistance in various areas such as technical support services, access to financing, counselling, marketing, access to equipment, and management assistance. Evidently, however, the range of services available at the different kinds of institution varies greatly, depending on the model and the objectives of the stakeholders (and nature and level of resources. However, in most countries, the services may, according to the United Nations, (2001, p.48-49) cover a combination of services listed below and in so doing offer different combinations of utility:

- Physical infrastructure includes offices or workshop space on an affordable basis. Having a registered business place is the first essential step in starting one's business;
- Secretarial services are provided for newly established small enterprises along with access to a mailbox, libraries and related services;
- Telecommunications and information technology services usually include access to telephone, telefax, e-mail, and the Internet;
- Business planning, assistance, resources, counselling services as one of the main tasks of a business incubator is to help make a business plan and advise on bookkeeping and filling in tax forms;

- Advertising and marketing services such as the provision of lists of potential suppliers, businesses, potential investors, and distributors;
- Financial advice services advising businesses on their funding and investments, as well as on their daily financial transactions;
- Training services providing insight into the principles of market economy, as well as upgraded professional and technical skills;
- Know-how services may be needed to help the tenants through the legal processes linked to the use of licences and know-how;
- Network services are very important at a business incubator, in particular in a virtual business incubator, providing links and relationships with other organizations that can promote and sustain the interests of its client businesses;
- Industrial infrastructure including roads, water, electricity, telecommunication, buildings and industrial machines can be provided. This is most common in technoparks;
- Aftercare services after the incubation period. Successful companies are financially viable and free-standing when they leave the incubator, usually after two to three years; and
- Security services particularly for companies dealing with intellectual property, hi-tech products etc. at risk of being targets of industrial espionage - both physical in situ as well as hackers on the Internet. In addition, the risk of "ordinary" burglaries or thefts may be very high in some countries or certain areas or cities. An incubator can provide physical security services much more cheaply than an individual company could and generally have access to the latest systems of computer and related security that individual businesses alone might not be able to acquire.

More specifically, however, in the EU, the profile of incubator services has been researched and quantified as follows:

Table 5.5.Types of Business Support Services[20]

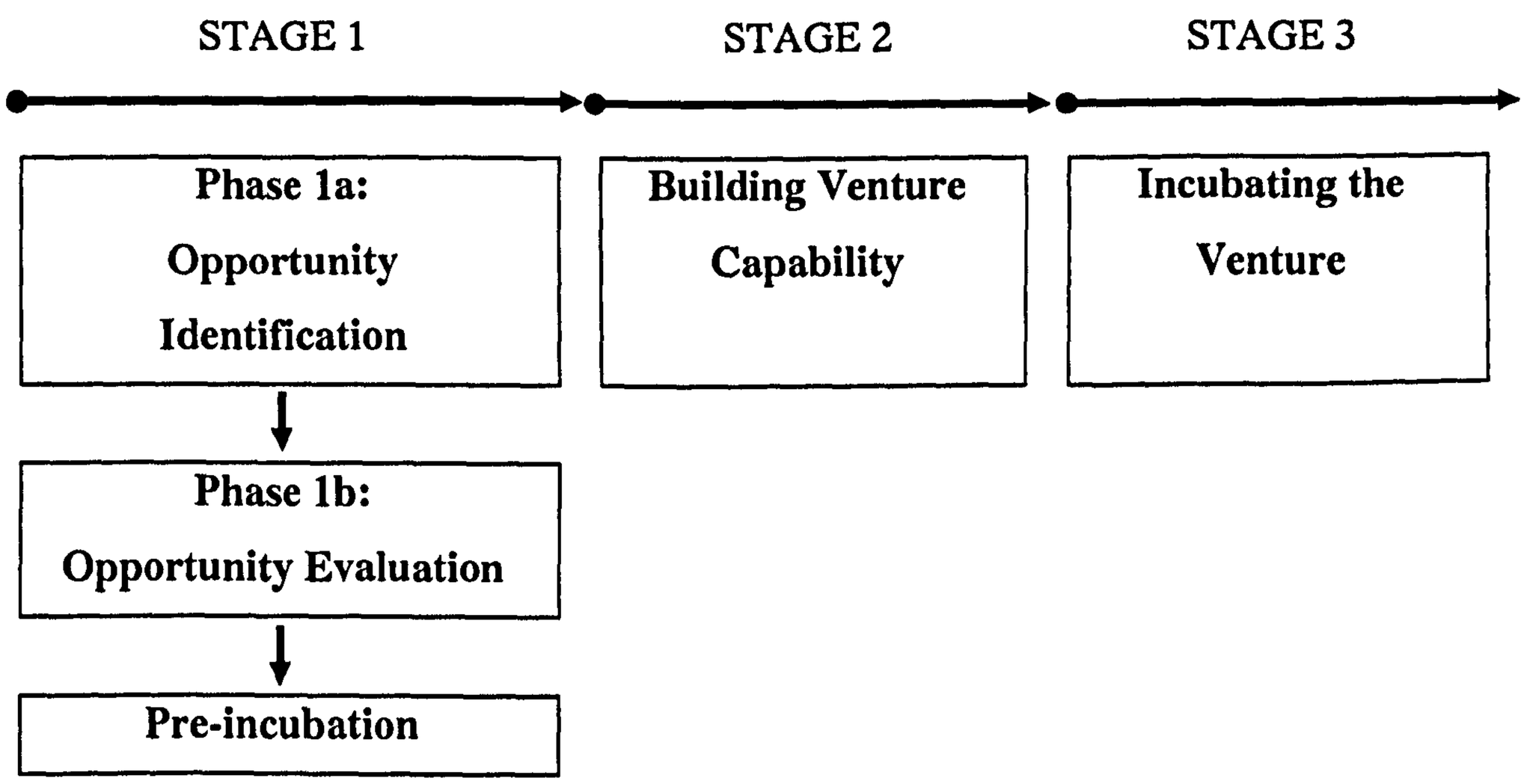
	In house		External	
Types of Business Support Services	**No.**	**%**	**No**	**%**
Pre-incubation services	66	11.7	15	3.3
Business planning and forming a company	62	11.0	25	5.5
Training to develop business skills	36	6.4	47	10.3
Accounting, legal and other related services	16	2.8	57	12.5
Market research, sales and marketing	31	5.5	52	11.4
Help with exporting and/or partner search abroad	28	5.0	42	9.2
Help with e-business and other aspects of ICT	39	6.9	35	7.7
Advice on development of new products and services	43	7.7	35	7.7
Help with raising bank finance, grants, venture capital	68	12.1	28	6.1
Incubator venture capital fund, business angel network	31	5.5	32	7.0
Advice on recruitment of staff and personnel management	32	5.7	35	7.7
Networking, e.g. with other entrepreneurs, customers	64	11.4	24	5.3
Mentors, board members and other senior advisers	38	6.8	27	5.9
Other Services	8	1.4	3	0.7

As may be observed from the above, pre-incubation and business planning/formation are prominent elements of the EU model (and core provision vis-à-vis the provision of services "in-house") as too are raising finance and networking. As regards services and expertise sourced externally, training, professional services, marketing and exports are particularly noteworthy.

[20] Source: European Commission Enterprise Directorate General (2002) Benchmarking of Business Incubators Final Report, Table 28, page 49

In the course of this research incubator managers and staff have stressed that amongst some of the highest 'added value' work they provide (and the most resource intensive and skilled) is their pre-incubation work. Pre-incubation as practiced throughout the incubator community is evidently varied and can he highly proceduralised or intuitive or may feature a combination of both and is illustrated below with reference to the pre-incubation stage of the incubation process practised at the Hive incubator at the Nottingham Trent University, which may be summarized is as follows:

Figure 5.1: HIVE Incubation Model



It was explained by HIVE staff that Phase 1a (above) is concerned with clarifying with candidates/clients the nature and scope of the opportunity to enable both parties (the University and client) to arrive at a more considered understanding of the opportunity and the way in which it may be progressed. At this stage, the HIVE's staff:

- Explore the nature of client's work and the origins of the business idea
- Investigate with the client, why business idea/product is desirable and identify main problems to be overcome and the technology required/to be employed

- Consider competitive products and the nature of the technology used in them. Consider limitations of technologies and products and identify competitors
- Explore with the client the level of significant technological advance present in the proposed product, process or service and how the new product/business addresses demands not answered by existing product, services or processes. Clarify IPR issues, and confirm whether patent searches have been carried out/applied for or been granted in relation to this proposal
- Outline the potential applications for the end product, service or process and identify main customers for it
- Determine the nature and level of assistance required to progress the concept further.

In addition, HIVE staff applies a mix of intuitive (but nevertheless proceduralised) judgements before accepting a client business i.e. Is there evidence of a strong entrepreneurial drive from the project champion? Is there a recognized need or want in the market place that is currently unfulfilled? Is there an innovative product or service response to this market need or want? And Is this a business opportunity that could benefit from having access to the knowledge resource base of the University?

Phase 1b of the pre-incubation stage (see above) is facilitated by the University's germinator unit which assists individuals and teams to firstly refine their business concepts, ensuring they are credible in the market place. With a credible business concept, the entrepreneurs are then provided with learning support and the environment to research and evaluate their opportunities. Specifically, what is sought is confirmation that the market opportunities exist for which the proposed business provides commercially viable solutions. With that confirmation milestone reached and working with partner organisations, the University germinator will provide support for the entrepreneurs to prepare business proposals. Entrepreneurs are subsequently assisted to develop **'A Business Concept Document'; 'An Opportunity Evaluation Report'; and 'Business Proposals'.**

The **Business Concept Document** comprises a number of elements:

- Identification and Definition of Business Opportunity
- Identification and Definition of Customers
- Indication of Customer need(s) and how need(s) are currently serviced
- Identification of competitor products and deficiencies in competitor market offering
- Identification of competitors (SWOT)
- Consideration of degrees of Novelty & Exploration of value added element and IPR as appropriate
- Proposals to commercially exploit perceived opportunity
- Identify Revenue streams and potential collaborators
- Assessment of Personal competencies/skills & Investor pitch

The **Opportunity Evaluation Report** seeks confirmation that the market opportunities exist for which the proposed business provides commercially viable solutions. The Opportunity Evaluation Report is concerned to establish the following in detail:

- **Market Definition** i.e. Is there potentially a market for the proposed product? What does it look like? How big is it? What is the market worth?
- **With what can the market be served?** i.e. What is the product/service? What does it look like, do? How will it be produced? What will it cost to produce it and get it to the distributors?
- **How can the market be captured?** How will the potential customers be turned into real customers? How will they be persuaded to buy? What advertising/selling routes will be used to bring the customer in contact with the product?
- **How can the market be reached?** What do the distribution outlets look like? How do they rank in order of perceived importance? What mark-ups do such outlets look for?

Upon completion of the evaluation report, and where appropriate, entrepreneurs will be supported to prepare detailed **Business Proposals** as to how

they intend to go about exploiting their business opportunity. Specifically, the business proposals so developed comprise:

- An **Executive Summary** featuring explanations of where the business idea has come from? (Background), what the business is planning to do (Business Concept), what the business proposes to achieve and by when (In Market & financial terms), an indication of the assistance required to achieve the business objectives (Investment support, management expertise, other)
- An exposition of the **Market & Competition** i.e. how the market is defined, proposals to reach and capture this market
- A **Product/Service Plan** explaining how the business proposes to serve its market and how the business proposes to produce or supply its product/service?
- A **description of the Business Structure** explaining who will be the stakeholders in the business? (Company, shareholders), what the business will look like (i.e. Premises, virtual entity, geographic) and how it will be controlled (Management, operations & support team)
- **Financial Forecasts including** Capital Requirements Budget, Operational Profit & Loss, Balance Sheet, and Cashflow Forecasts

It is only upon the completion of the 'Business Concept Document'; the 'Opportunity Evaluation Report'; and 'Business Proposals' that businesses progress through this pre-incubation stage, into the "Building Venture Capacity" stage wherein the client is supported to implement their business proposals. Essentially a 'proof of principle' stage that seeks to establish that there is indeed a market for the proposed product or service, proof that the business can capture that market, proof that the product or service 'works' for customers in the market place, and proof that the management of the new enterprise is capable of commercially exploiting the opportunity. During this phase the Hive staff assist entrepreneurs to structure their business; enact marketing strategy; implement operational functions; secure the IPR position; establish operating environment, systems and procedures; and achieve financial fitness.

Subsequently, the incubated businesses move into the 'Incubating The Venture' stage wherein the businesses benefit from the supportive growth environment, provided by Hive incubator partners which include in their number Broadway Media, Nottinghamshire Business Ventures (local enterprise agency), LloydsTSB and HSBC (bankers), Internova UK (WWW consultants), Business Link, IP21 (Intellectual Property specialists), Blythens, Spirit and The Church Partnership (Chartered Accountants and Business Strategy Advisers), GTN (Grasp the Nettle - a Nottingham based business support organisation), Berryman Shacklock and Eversheds (Solicitors) and GOEM (ESF grant providers). During this phase of the incubation process the Hive's Growth Management Team assists the entrepreneurs to develop business plans and - where necessary - help them secure 2nd-stage investment capital.

As may be observed from the above, the incubator provides (particularly during phases 1a and 1b) an intensity of support which is accorded a high-added value by incubator personnel and by the incubated firms. Notwithstanding this model of the incubation process and the somewhat linear model of incubation featured in Chapter 4 (WestBIC's 'New Business Development Path'), in reality incubation is not always such a straightforward affair as businesses may seek an incubators support and services at different stages in their development i.e. not all businesses 'incubated' by incubators begin life in the incubator and may for example originate elsewhere i.e. seek to locate within an incubator to access support to accelerate growth.

The notion of high-valued added services or indeed a distinction between lower and higher value services is explored for example by Lalkaka (2003) (illustrated below) who suggests that incubators should endeavour to provide a combination of low and high value added services (higher value added functions feature at the top of the pyramid).

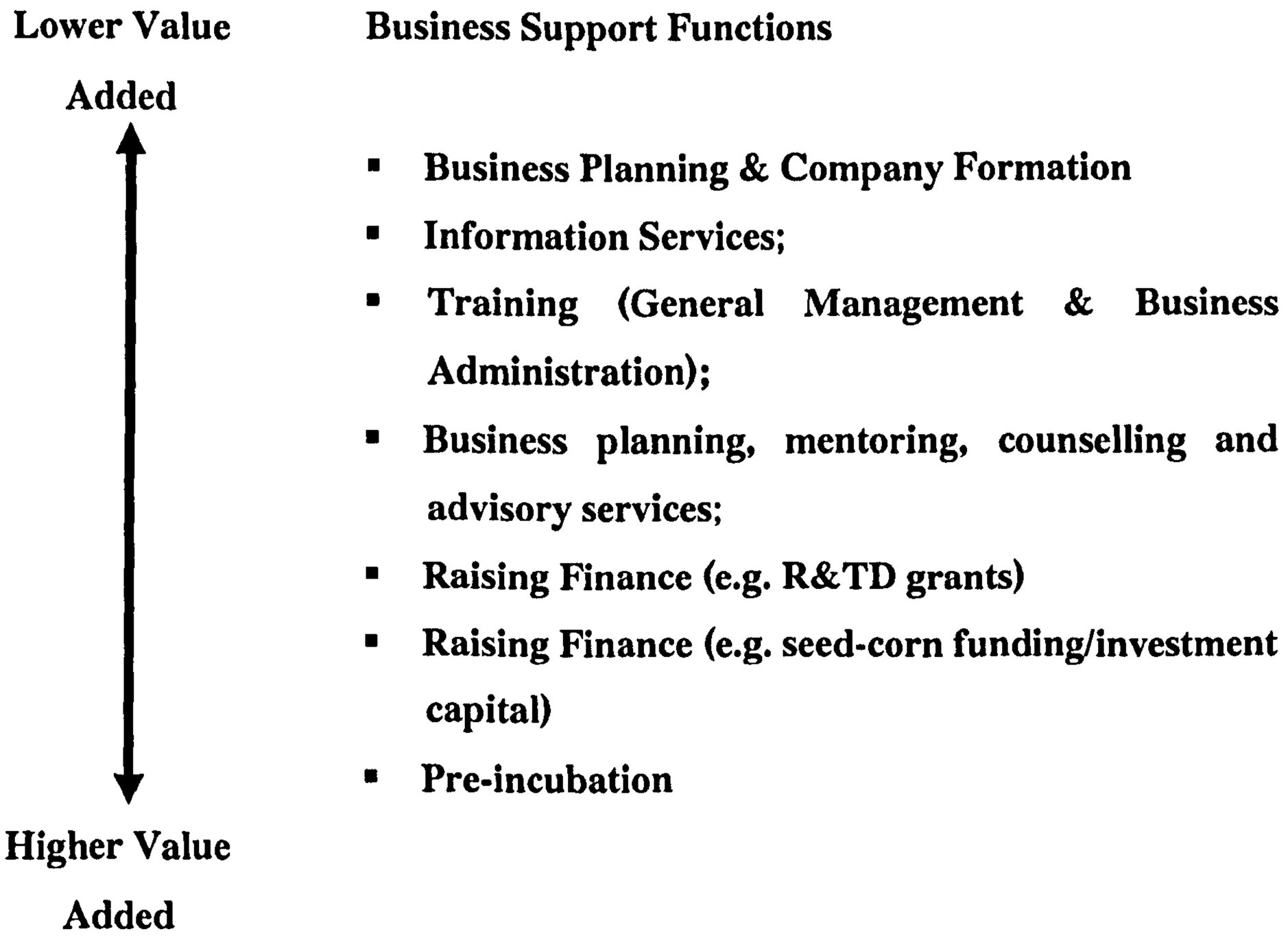
Figure 5.2: Added Value Incubator Business Functions



Source: Lalkaka, R., 2003,
National Workshop on Technology Parks and Business Incubators

However, Lalkaka's service or model of incubator functions seemingly omits consideration of those other client services provided by an incubator e.g. to public and regional authorities i.e. economic development, work to build entrepreneurial cultures, etc, which are so integral to a great many incubator service models and objectives but are not so neatly modeled (see The 'Added Value' of Incubators: Rationale (above)). As part of the research undertaken in the course of this study a simplified service model of business support services and functions was hypothesized in consultation with incubator staff at NEBIC to explore notions of value-added and utility (see below) with NEBIC tenants:

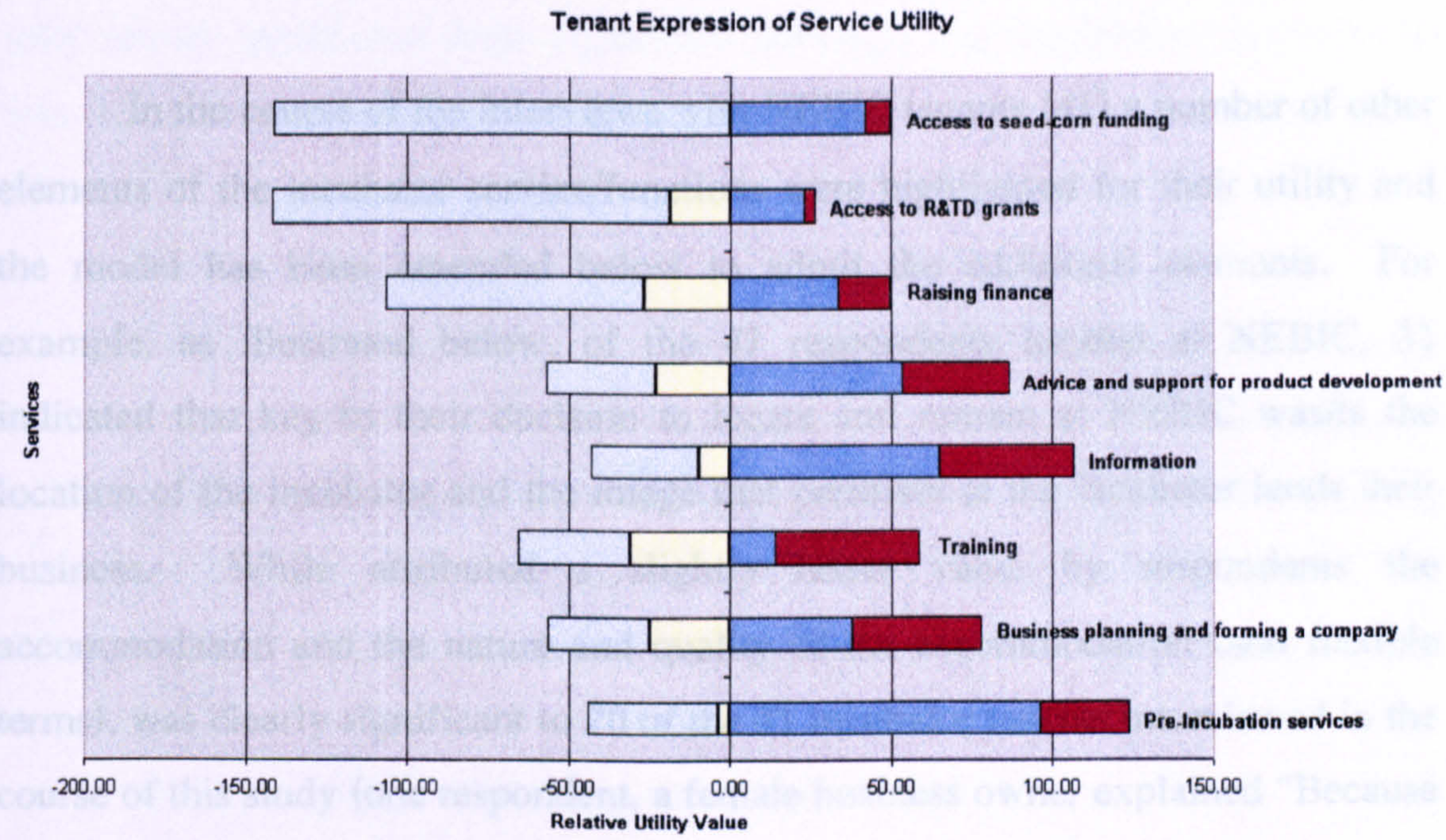
Figure 5.3: Draft Model of NEBIC Business Support Functions by Added Value



Subsequently, the accuracy of this notional construct of added value was investigated with NEBIC tenants to determine whether this accorded with their perception of i.e. as regards what they viewed as 'high value added' support i.e. support with the most utility.

Using a graded four point scale, adjusted for the valid percentage response and weighted accordingly (Most valued accorded a value of +2, Least Valued -2 and the intervening points on the scale of +1 and -1, respectively), tenants were invited to express their view (in the course of a tenant survey and structured interview) as regards the utility of NEBICs Pre-incubation services; Business planning and company formation services; Training services; Information services; Advisory Services and Support in development of new products, services and/or processes; Help with raising finance; Help with accessing R&TD Grants and Grants to support Innovation; and Assistance to access seed-corn funding and venture capital funding. The tenant responses are illustrated below:

Figure 5.4: NEBIC Tenant Interview Responses



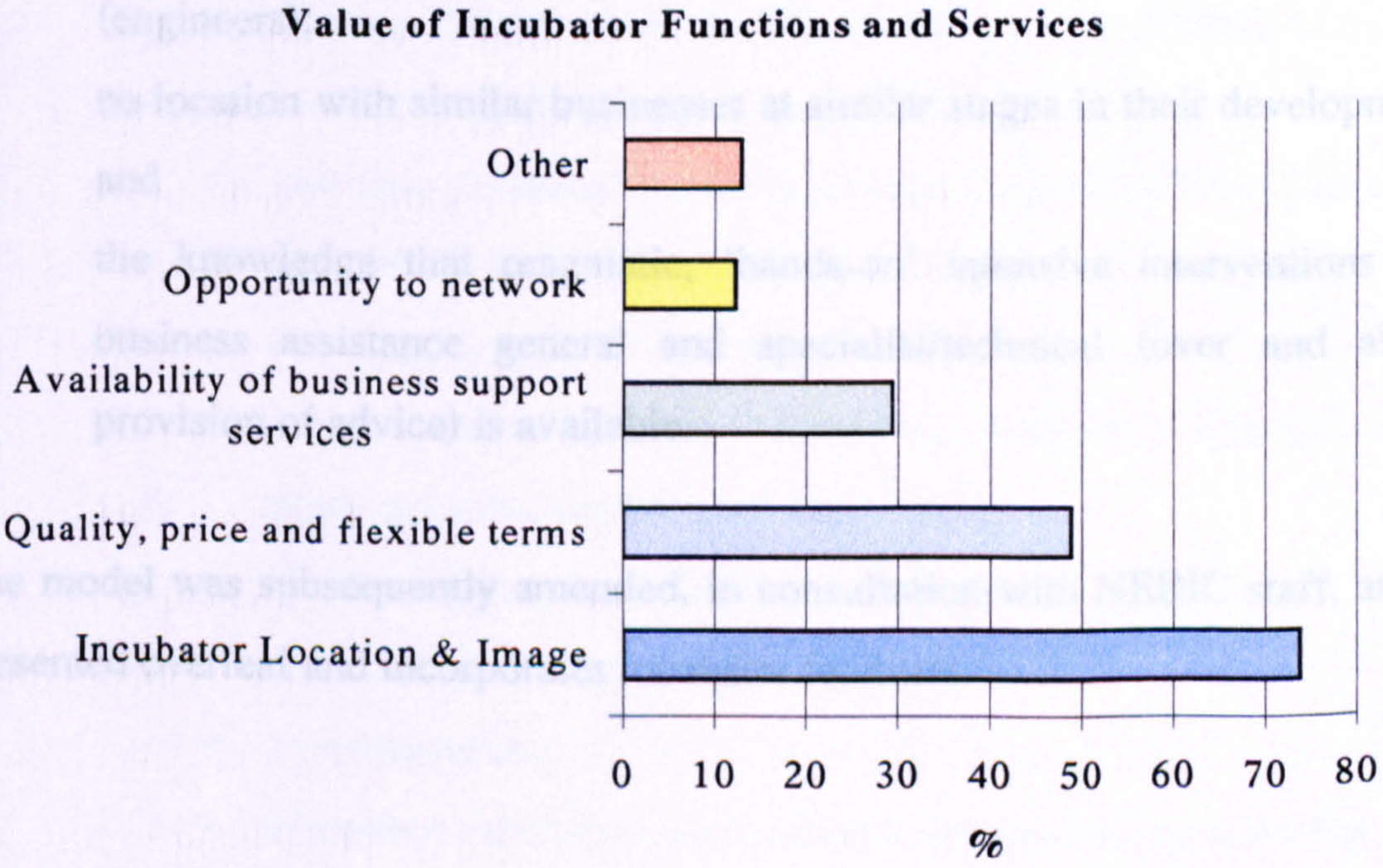
As may be observed from the chart above, Pre-Incubation Services, Information Services, Advice and Support for product development, Business Planning and company formation services were rated most highly vis-à-vis their utility. Particularly notable was the response received as regards Information Services that, while profiled above as perhaps being a less valued added function, was accorded a high value/utility by tenants. Raising finance (access to R&D grants and seed-corn funding) although generally regarded as a high value activity within the incubator community was marked for a lack of utility and despite being profiled (in the model and other literature e.g. Lalkaka above) as a high-value added function.

This was not however a reflection on the incubator's service and while a range of explanations were offered by tenants they can be broadly summarised as a combination of factors which include a lack of interest or general reluctance to raise finance in exchange for equity and/or that there were in the view of the majority of incubated businesses interviewed relatively few grant instruments for which they were eligible or, more often, few that they were prepared to pursue (i.e. grant systems such as EU Commission Framework programmes had evidently been dismissed by many as too complex, overly bureaucratic as regards

reporting requirements to say nothing of onerous application processes, and the limited chances of success (reportedly only 1 in 6).

In the course of the interviews with NEBIC tenants (41) a number of other elements of the incubator service/functions were highlighted for their utility and the model has been amended below to admit the additional elements. For example, as illustrated below, of the 41 respondents located at NEBIC, 31 indicated that key to their decision to locate and remain at NEBIC was/is the location of the incubator and the image that premises at the incubator lends their business. While attributed a slightly lesser value by respondents the accommodation and the nature and quality of the accommodation (and flexible terms), was clearly significant to 20 of the 41 incubator tenants interviewed in the course of this study (one respondent, a female business owner explained "Because I am a woman and arrive early in the morning and work late into the evening when there are few people around the security at NEBIC is key for me and I know for most other women working at the site".

Figure 5.5: NEBIC tenant interview responses



Perhaps surprisingly, the nature and level of business services provided was accorded a lesser value than premises (only 12 of the 41 businesses interviewed considered them significant although one respondent in particular was keen to emphasise that the assistance available to her "as a woman is priceless").

Further, the opportunity to network with other businesses (much vaunted in the literature and within the business incubator community) was not regarded as being particularly significant (only 5 of the 41 respondents interviewed considered this aspect of the incubator environment as being of particular value). Other services and functions cited by the tenants as having particular utility included:

- proximity or relationship with the region's universities;
- the ability of the incubator to facilitate links/collaborations with other business support agencies;
- assistance with the development of partnerships/technology collaborations;
- the availability of specialist facilities (e.g. access to rapid prototyping technology/equipment) and personnel i.e. technology specialists (engineers);
- co-location with similar businesses at similar stages in their development; and
- the knowledge that pragmatic, 'hands-on' intensive interventions and business assistance general and specialist/technical (over and above provision of advice) is available.

The model was subsequently amended, in consultation with NEBIC staff, and is presented overleaf and incorporates incubator facilities.

Figure 5.6: Model of NEBIC Business Support Functions (Value Added)

Lower Value Added

Business Support Function(s)

- Physical infrastructure (accommodation - nature and location); Communal facilities
- Telecommunications and information technology services usually including access to telephone, telefax, e-mail, and the Internet;
- Property Management & Administrative Services (e.g. secretarial, security, mail-box/handling);
- Opportunity to network with other co-located incubated businesses;
- Advertising, marketing and publicity services;
- Assistance with identification and engaging e.g. collaborators (technology providers/partners);
- Training (General Management & Business Administration);
- Access to incubator networks (personnel, facilities, equipment and other specialist business support providers);
- Facilitation of collaborations with research centers/specialists e.g. within affiliated universities
- Raising Finance (e.g. R&TD grants);Raising Finance (e.g. seed-corn funding/investment capital);
- Business planning, mentoring, counselling and advisory services;
- Specialist facilities and infrastructure (e.g. access to rapid prototyping technology/equipment);
- Know-how services i.e. technology specialists (engineers) and other technical/professional services;
- Business planning & Company Formation
- Information Services;
- Pre-incubation;
- Hands-on intensive interventions and business assistance (over and above provision of advice) - general and specialist/technical.

Higher Value Added

5.4 Summary

This chapter has explored the development of support for indigenous firms from protectionism and economic engineering (i.e. the promotion of mergers and acquisitions and cluster strategies), subsidies for inward and/foreign direct investors and systems of grant aid through to the development of services to support small businesses, specifically business incubation and the ways in which incubators seek to add value and impact/support the growth and development of indigenous SMEs.

A noted above, while definitions as to what is and is not an incubator vary, incubators have been established, predominantly by national, regional and local government and public agencies e.g. universities (and combinations thereof), to achieve a range of socio-economic ends. Further, and while it is difficult to get a fix upon the number of incubators world-wide, by country or indeed by region (a problem compounded by the degree of variation within the incubator model, the rate of addition and the fact that not all incubators naturally elect to enumerate themselves as such while others that do so may in fact offer an array of services that amount to something less than business incubation as now understood and defined within the incubation industry), it is evident that in policy terms they command significant interest, support (political and financial) and are increasingly perceived as an instrument that can remedy a range of economic and social ills by supporting indigenous firms, specifically SMEs (for the reasons enumerated above and in Chapter 2).

In general terms, an incubator may be said to comprise, according to Lalkaka (2001, p.5):

> "a micro-environment with a small management team that provides physical work-space, shared office facilities, counselling, information, training and access to finance and professional services in one affordable package. Incubators vary widely in their sponsors (state, economic development group, university, business, venture capital), objectives (from empowerment to technology

commercialization), location (urban, suburban, rural, and international), sectoral focus (technology and mixed, now including kitchen and arts incubators) and business model (not-for-profit or for-profit)"

While this definition seemingly omits consideration of 'virtual incubators', it has been suggested in the course of this research and is seemingly implicit in the word employed to describe the form that an 'incubator' comprises i.e. a physical environment within which the process of incubation occurs (and from which incubation services may be delivered (i.e. outwith the walls of the incubator)). While a number of authors have suggested that 'virtual incubators' should be considered as part of the model, this appears to corrupt the basic concept in an effort to admit what are in effect other business support providers or essentially consulting organizations (public entities or otherwise). This is not to dispute or devalue the incubation services being provided by business support organizations without business accommodation i.e. it is accepted that they are providing incubator services.

However, it is evident from the course of this research and interviews conducted with incubator managers that there are serious doubts as to whether the 'virtual incubator' model is ultimately sustainable (without significant and sustained subsidy). It is perhaps telling that of the two 'virtual incubators' identified at the outset of the research and 'BIC accredited' (Pronovus and BIC SwedenWest - see Chapter 4), both have folded apparently for lack of (public funds) i.e. have proved unsustainable or have otherwise failed to develop other revenue streams so as to dilute their reliance on the public purse.

Indeed, while incubation is now an established business support mechanism and further that within, for example, the European and US stock of incubators a great many should, it might be thought, have achieved a level of maturity and financial security/sustainability - subsidy still evidently remains key to US and European incubator operations, though perhaps more so as regards the latter. In the EU, as illustrated below, subsidy is generally integral to the EU model:

Table 5.6: EU Incubators Sources of Funding[21]

Sources of Funding	*%*
(1) Subsidies – EU and other international agencies	10.1
(2) Subsidies – National authorities and public agencies	27.3
(3) Payments from banks and other private sector organisations	2.6
(4) Payments from universities and other R%D organisations	3.0
(5) Rental income and other incubator charges	39.5
(6) Other revenue, e.g. from service contracts	11.1
(7) Investment income, e.g. royalties, equity returns	0.8
(8) Other sources	5.6
Total	100.00

Indeed, of the incubators surveyed in the EU Commission Enterprise Directorate General's Benchmarking of Business Incubators Final Report (2002) more than 60% of respondents indicated that subsidy was integral to their business model (as compared to 36% as reported in a US study - Lalkaka (2003)), while 21.8% indicated that without subsidy incubator operations would cease completely (as compared on only 13.5% in the US)

[21] Source: European Commission Enterprise Directorate General (2002) 'Benchmarking of Business Incubators Final Report', Centre for Strategy and Evaluation Services, p.44

Table 5.7: Importance of Cash subsidies to Incubator Operations[22]

	Europe		US	
Importance of Cash subsidies	Number	%	Number	%e
(1) Incubators activities could be maintained at current levels	6	7.7	9	17.3
(2) Incubator activities would have to be reduced significantly	31	39.7	12	23.1
(3) Incubator activities would stop altogether	17	21.8	7	13.5
(4) Not relevant – incubator does not receive subsidies	9	11.5	18	34.6
(5) Don't know / No answer	15	19.2	6	11.5
Total	78	100	52	100

Given the level of subsidy and its importance to the modality in Europe, it is not perhaps surprising that 'break even' i.e. the objective of becoming self-sustaining is absent from so many EU business incubator models:

Table 5.8: Is 'break even' part of (EU) Business Incubator's business plan?[23]

Part of Business Plan	Number	Percentage
Yes	51	40.8
No	62	49.6
No answer / don't know	12	9.6
Total	125	100.00

As noted above and notwithstanding European State Aid Rules the European Commission has in fact recently given its approval to a German proposal to support the users of technology centres and incubators with state aid

---

[22] Source Data: European Commission Enterprise Directorate General (2002) 'Benchmarking of Business Incubators Final Report', Centre for Strategy and Evaluation Services, p.46; and Lalkaka, R. (2003) 'Technology Business Incubation: Role, Performance, Linkages, Trends, National Workshop on Technology Parks and Business Incubators', Isfahan Science & Technology Town, Isfahan Iran, 20 - 21 May, 2003

[23] Source Data: European Commission Enterprise Directorate General (2002) 'Benchmarking of Business Incubators Final Report', Centre for Strategy and Evaluation Services, p.45

by allocating 120 million euro per year for newly created or technology-oriented small and medium sized enterprises (SMEs) that use these centres. Under this national scheme, the costs of office rental, consultancy services, research accommodation, networking with other companies, and cooperation with universities and research institutes - all services provided by technology and incubation centres - will all be met by the government.

Notwithstanding business incubator finance, the nature of stake-holding and stakeholder objectives (as explored above) it is possible to derive, from a consideration of the literature (industry and academic) and from observation of incubator operations visited in the course of this research, a model as to what characterises an 'incubator' as distinct from 'providers of incubation style services':

1. Accommodation: A site or sites featuring managed accommodation (that may service multiple tenants, and business sectors and featuring shared space and services) let on flexible terms (easy in/out clauses) and offered at highly competitive and/or often subsidised rates;

2. Business Support Services: An array of business development services (including information services) provided from within and outwith the incubator's permanent staff and specifically services that can be provided with an intensity and in a pragmatic, interventionist manner (if required) wherein mentoring, coaching and/or training can be supplemented with 'hands-on' support and assistance to develop e.g. business plans, raise finance, apply for R&D grants, prepare commercial tenders, make a 'sales pitch', production of 'prototypes', etc.

For example, in the course of this research and, specifically in the course of a visit to the 'Digital Factory', Alan Kersh (Bishop Auckland College Assistant Principal and Director of Corporate Development and Partnerships) explained that a firm (assisted by the Digital Factory) which had been invited to tender for the supply of automotive components to a major automotive manufacturer (wherein the terms of the tender process required responses in less than 10 working days) was able to attend and make a sales presentation which not only featured

drawings and a CAD/CAM illustration of the components (an activity also supported by Digital Factory staff) but also a physical prototype of the component (assembled using the Digital Factory's Thermojet "wax deposition rapid prototyping capability") a feat, which given the timescale for tender respondents was instrumental in winning the contract evidencing this firms imagination, commitment to the contractor and rate of work;

3. Linkages throughout the supranational, national, regional and local innovation/business support infrastructure: Access to broader networks of other business support intermediaries/experts, programmes and facilities (e.g. from within national, regional and sub-regional incubator associations, universities, venture capitalists, etc);

4. Provision of pre-incubation services i.e. whereby incubator personnel assist in the development of business ideas and appraise commercial viability, etc, – see HIVE example above.

5. The application of selection policies or entry criteria: A number of incubator studies within and outwith the industry have suggested that incubators should operate selection policies (entry criteria) which may include not only a consideration of the viability of the tenant business but also, for example, a designated technology sector, the businesses capacity to grow (i.e. at an accelerated rate) and the capacity/ability of the incubator to assist in the firms' development.

It has been observed in the course of this research, that selection is generally a calculation of the commercial viability of the business and (especially amongst experienced incubator managers) a range of other intuitive factors. For example, at NEBIC tenant business must demonstrate innovation in their product, processes or services and potential for growth or otherwise present an innovative business idea with job creation potential to fit with the ethos of the BIC (which is specifically concerned to support innovative businesses)the BIC's decision as whether or not to accept an application is generally informed by a consideration of commercial viability:

- the number of years the business has been trading; the number of employees (current and projected including an explanation of their roles/duties);
- a description of the uniqueness of the applicant's product/services;
- the level of technical innovation and its context within the relevant business sector (and whether patents gave been sought or granted);
- a definition of the market (including market research as may have been undertaken by the applicant);
- competitive advantages of the applicant's product(s)/service(s);
- the nature and level of business assistance the applicant has received (including grants and awards);
- the applicant's estimated need for premises (immediate and projected with reference to business development forecasts) and additional staff;
- funding required in next 12 months to two years;
- the nature and level of assistance the applicant is likely to seek in pursuit of their business development objectives; and
- a consideration of the applicants accounts (Turnover, profit and loss, fixed assets, current assets and liabilities, long term liabilities, share capital and profit and loss balance).

In addition, a number of intuitive factors were identified in the course of interviews with incubator managers and staff as forming part of the profile of what a prospective tenant might 'look like'. Evidently, at NEBIC this is generally held to be as follows:

- In the main, the majority of successful start-ups at the BIC have been observed as comprising / set up by individuals who are 40+ years of age with senior / middle management experience who readily accept that more than a nine-to-five commitment is required;
- These individuals tend to have a level of business skill, people management skills and technical expertise that must be underpinned by support in generic business areas;
- The majority have entered the BIC with a process, service, idea or method of production as opposed to finished product;

- They are noted for their willingness to invite criticism from the support staff and to seek and take advice;
- They possess, by virtue of their experience, developed interpersonal skills and a level of credibility with suppliers and customers;
- They also tend to have established networks of potential collaborators and more importantly, start-up capital (derived from severance payments, early retirement/retirement lump sums, etc) that has rendered them financially 'secure'; and
- This group of owner managers have in many cases achieved, what might be considered, a high standard of living that they wish to maintain and better. To that extent peer or social pressure to succeed has also been observed as an important driver in their success.

Herein however lies one of the challenges for incubator managers being tasked by stakeholders to support new 'types' of entrepreneur (e.g. social enterprises) or classes of entrepreneur (e.g. graduate businesses) who do not accord with, for example, the profile of entrepreneur they have evolved to support naturally and by virtue of their experience. The new entrepreneurs e.g. social entrepreneurs or graduate entrepreneurs which many incubators are increasingly seeking to support (with the encouragement of funding agencies) present new challenges, frequently requiring new approaches and new levels of understanding as regards the nature of e.g. graduate incubation.

For example, considering the anatomy of the model entrepreneur supported by NEBIC (as per the profile above), a graduate start-up, notwithstanding the quality of the business idea, generally lacks the business experience and moreover the financial resources. Indeed one of the main challenges for graduate start-ups in the UK is surely the level of debt a graduate may be carrying on completion of their studies to say nothing of the capital assets they lack against which to borrow or invest in their business.

Furthermore, with for example, graduate incubation as observed in the course of this research as being practised by, for example, university incubators, the financial position and level of experience of the graduate may also present the

incubation industry with an ethical challenge as graduate start-up business owner managers may be under significantly more economic duress vis-à-vis any negotiation with their incubator for the provision of services in exchange for equity and it has been queried, in the course of this research, whether the conduct of incubator operations, in this aspect at least, should be regulated. Notwithstanding, it is however very rare within the European incubation industry for incubators to take an equity position in their client businesses (7.7% in Europe (European Commission Enterprise Directorate General, 2002, Benchmarking of Business Incubators Final Report) as compared to 34.6% in the US (National Business Incubation Association, 2002, State of the Incubation Industry). Indeed, within Europe and particularly the UK graduate incubation is largely subsidised with European Structural Funds (e.g. Objective 2) and by Regional Development Agencies (see the HIVE at the Nottingham Trent University).

6. The application of exit policies or criteria. Finally, in a similar vein to entry policies or criteria, it is frequently postulated that exit policies do/should form part of the incubator model i.e. UKBI's Incubation Framework - "critical elements and core principles" (Appendix) - and part and parcel of a "true incubation environment" (p.4). However, in practice this appears to be rarely the case with incubators keen to preserve revenue streams from the incubated businesses as they grow in scope and scale.

In reality, as tenant demand for premises increases and they generally become more financially secure (and thus incubator management can be more confident in their ability and capacity to pay), they may also become less reliant on incubator services provided often as part of the tenancy agreement, (particularly resource intensive activities such as pre-incubation and services provided at the fledgling stage). Thus, the 'margin', in the provision of services provided to the incubatees (provided they can still be accommodated) may be said to improve which may be used to cross-subsidise less economic activities.

In the course of this research, it has become evident that those incubators providing an array of business support services and other strategic services, that are regional in scope i.e. outwith their immediate locality such as the Big Ideas

programme featured in Appendix 3 derive strength (financial and thus political) from their scale, and moreover, their ability to accommodate and/or incubate or provide services to existing businesses i.e. mixing an ability/capacity to incubate fledgling firms as akin to a 'hatchery' and provide an environment and business support services suited to more mature firms.

As observed in the course of this research, heavily or wholly subsidised incubator operations are seemingly content to provide the former, however with increased uncertainty surrounding the funding of incubation (exacerbated by the hitherto unknown consequences of the loss of structural fund status throughout parts of Northern and Western Europe) there is seemingly an increased sense of urgency to develop the latter aspect of operations to more readily assure sustainability (i.e. increase their incubator property portfolio to accommodate businesses at less risk of failure (and an increased capacity to pay)).

Further as stakeholders increasingly expect incubators to be self-sustaining which seemingly denies the basic rationale for incubation services, that of a market failure within the business support sector. This market failure may be said to comprise the fact that:

(a) the provision of incubation services (by which we mean the incubation of 'fledgling' companies) is inherently non-commercial insofar as it is ultimately unlikely to generate an adequate rate of return to be sustainable of itself; and
(b) incubatees can ill afford business support services that are not subsidised i.e. charged at commercial rates.

It is therefore not surprising, that as stakeholders apply commercial metrics to the incubation process that incubators are generally developing and maturing so as to operate not only as hatcheries but also as providers of business support and accommodation to established enterprises. Those incubators visited in the course of this research that have integrated these two spheres of operation have seemingly achieved levels of regional leadership (See Chapter 4 BIC Case Studies) unmatched by their peers who confine their activity to 'hatchery' style

activities only – they are seemingly much smaller in scope and scale and perhaps more vulnerable to changes in the political and financial climate (new political priorities and fiscal pressures).

Thus, the notion of exit criteria seems hardly appropriate particularly in the current incubation 'business' climate. Further, and notwithstanding a public policy concern that particular firms do not benefit, disproportionately, from 'public' assistance (see also, European Commission State Aid regulations), a number of incubator operations visited in the course of this research have however managed to pay at least lip service to and/or conform to the notion of exit policies by designating/re-designating small units/parts of their property portfolio as their 'incubator' (i.e. an incubator (in effect a hatchery) within an incubator) from which tenants exit into 'grow on' space elsewhere in the 'incubator' i.e. effectively move into the rest of the incubator's portfolio of accommodation. However, it does not necessarily follow that the incubatee having left the designated 'incubator' property is no longer being 'incubated'- in reality they have merely changed their address (but are living on the same street).

Chapter 6: Incubator Impact (North East Business & Innovation Centre)

6.1 Introduction

This Chapter seeks to explore the way in which incubators impact their client base (and considers the contribution of NEBIC against qualitative and traditional quantitative metrics. The chapter concludes with an assessment of the way in which incubators have added value or rather impacted the performance of incubated firms with reference to their 'behaviour(s)' as compared with businesses located outwith business incubators.

6.2 Evaluating Regional and Local Added Value and Impact

Naturally, the measurement of the effectiveness, success or impact of business incubators depends in part upon the focus and nature of the measurement and more specifically

- what and how 'success' or 'impact' (impact on what?) is measured;
- whether the measurement is quantitative and/or qualitative;
- the nature of the measurement (e.g. Goal-based (Etzioni, 1964), systems Georgopolous and Tannenbaum, 1957) and multiple constituency (Thompson, 1967; Pennings and Goodman, 1977) approaches which examine performance with reference to the incubator's goals, multiple parameters and stakeholder agendas, respectively)
- scope, scale and range of measurements taken;
- whether they are comparative/intended for comparison/benchmarking;
- the perspective of the measurer (by whom) which itself may influence the nature, selection and analysis;
- the purpose for the measurement/interest in and/or the potential application of the results (why and to what end, see also perspective) and the manner in which this may effect the availability, collection, interpretation and analysis of date;
- the availability of data and comparable data; and

- the degree and extent to which causation or linkages between cause and effect can be established

Goal based approaches are however complicated by the predilections of stakeholders and sponsors which ultimately influence incubator strategies (objectives) and plans. For example, venture capital based facilities seek profit and high portfolio returns patents, spin-offs, equity in clients; a university sponsor may seek to commercialise university intellectual assets or IPR and/or support graduate and academic entrepreneurship and retention (Students and staff); a private developer or indeed a local authority property department may have the development of its property portfolio (redundant or derelict sites) and income generation; a regional economic development agency may seek employment, regeneration, enhancing the spirit of enterprise, while an educational authority may seek services to supplement the teaching (national) curriculum – see Appendix 3). All too frequently, incubator stakeholders may include all these interests.

Notwithstanding the above, a number of studies have explored incubator outputs, outcomes and indicative measures of performance. Incubator outputs, outcomes and impacts have been generally reported to include:

- economic development and diversification;
- technological development and advances;
- job creation;
- enterprise creation;
- number of businesses created and/or assisted;
- improved sustainability of enterprises;
- increased profitability;
- improved growth;
- creation of taxable incomes;
- the performance of the incubator;
- interactions between incubator and the research base (universities); and
- other community benefits.

A number of studies have however queried whether it is possible to determine (objectively) whether:

- assisted firms would have performed as they have without incubator assistance – see Bearse(1988, p,332-333);
- the performance of assisted firms can be accurately (objectively) measured against comparable businesses that have not received assistance (difficulty in identifying directly comparable firms); and
- incubators increase the local stock of innovative and/or high growth enterprises (i.e. there are irresolvable difficulties vis-à-vis attribution and establishing causality – other factors may in fact play a more significant role).

Previous research has also noted not only the difficulty in assessing economic effects (direct and indirect impacts on competitiveness (sales of products, exports, etc) at a macro or, indeed, micro level), but also less tangible impacts and non-economic effects including the degree and extent to which incubators have, for example:

- mobilised and affected the behaviour of indigenous businesses, institutions and regional organizations;
- created public–private partnerships;
- enhanced networks and connectivity between regional actors;
- contributed to the creation of an entrepreneurial, research or innovation culture,
- improved local/regional image (within and outwith the region/locality);
- increased regional aspirations;
- informed the regional political agenda; and
- contributed to the policy making process.

Evidently, both the literature dealing with effects and those self reported by the community tend to assert or lay claim to direct results and in so doing rather fail to acknowledge or dismiss the fact that incubators tend to work and make their contributions as part of a regional system of actors and as part of a surrounding

environment in which there are multiple inter-relations between conditions and the different actions of many regional agents and institutions involved and combinations thereof and deny the level and complexities of such interactions. Furthermore, much of the literature (from within and outwith the incubator community) when it does assert positive effects and impacts as generated by incubators fails to account or adjust or interpret 'results' for other regional dynamics (not least other actors in the innovation system/business support infrastructure)

Furthermore, it is evident from the literature (that exists) and research undertaken to date that much of the consideration and evaluation of quantitative and qualitative effects is drawn largely with reference to quantitative outputs. For example, examining the metrics applied to report and 'assess' the performance of incubator projects and programmes delivered by the North East Business and Innovation Centre (with Structural Fund support) the performance measures as required by various and multiple funding agencies have included:

Job/employment creation (directly, indirectly and multiplier effects)

- Number of Jobs generated in the incubator (no. of employees per tenant), measured by employment years and/or fractions thereof and last e.g. at least one calendar year;
- Number of Jobs created by companies after leaving the incubator (graduates), measured by employment years;
- Jobs and/or fractions thereof created in supplier businesses by creation and sustainability of incubated firms
- Jobs safeguarded in incubated/assisted firms (directly) and/or connected/supplier businesses (indirectly)
- Number of jobless beneficiaries securing employment

Enterprise creation and development

- Number of new business starts facilitated
- Number of new business start sustainable after 3 years/Incubatee survival rates (relative to non-incubated business stock), measured by numbers of firms incubated and number of discontinued businesses.

Education and training

- Number of unemployed people trained
- Number of self-employed people trained
- Number of employed people trained
- Number of unemployed people gaining a vocational qualifications
- Number of self-employed people trained
- Number of employed people gaining a vocational qualifications

Information, Advice and Guidance

- Number of awareness raising events/activities for local employers
- Number of SMEs advised
- Number of graduates advised
- Number of unemployed persons advised
- Number of persons over the age of 45 receiving guidance/assistance

SME assistance (Mentored)

- Number of New SMEs assisted
- Number of SMEs assisted
- Number of SMEs assisted to obtain financial support (grants and/or investment)
- Number of SMEs assisted to export
- Number of SMEs assisted to undertake joint ventures
- Value of SME Investments

Community Development

- Number of community groups and organisations assisted
- Number of new community enterprises assisted
- Number of community facilities created/improved

Environmental

- Number of environmental schemes developed
- Number of new or existing SMEs assisted in the green economy sector"
- Number of SMEs undertaking environmental audits or reviews

- Number of projects incorporating Sustainable Drainage Systems (SuDS) – the number of projects actively managing the surface water run-off from their site or premises.
- Metres squared of green space created or improved that has wildlife value
- Number of SMEs obtaining their energy from renewable sources
- Use of brownfield sites, remediation of land, addition(s) to townscape/landscape (new build) refurbishment of underutilized/derelict premises

Research & Technological Development

- Value of business expenditure on research and development
- Number of designs/prototypes/products/processes developed
- Number of IP Protections (Patents, Copyright, Trademarks)
- Research commercialized through development work (by firms) at the incubator, measured in numbers of projects and economic activity (employment years, total cumulative revenues)

Economic activity (directly, indirectly and multiplier effects)

- Value of new sales in SMEs (£s)
- Value of safeguarded sales in SMEs (£s)
- Value of sales generated in the incubator and thereafter (following graduation) (£s)
- Increase in turnover/profitability (£s)

Other

- Number of enterprises assisted to achieve IiP, ISO, ENV, etc
- Taxes and other "social" contributions by incubator tenants and graduates, measured by property, income, employment and other direct tax revenues attributable to incubator, tenants, and graduates:

6.3 The Impact of European Business and Innovation Centres

EBN, the EU BIC incubator association reports impacts or the degree and extent to which the EU stock of European Business and Innovation Centres have added value and impacted their locality in similar terms. For example, in the 2004 BIC Observatory Report[1], EBN draws the impact and added value of BICs with reference to a host of quantitative indicators:

Creating innovative new businesses

- 450,000 projects pre-selected for start-up support
- 98,000 selected projects following feasibility study
- 42,000 Business plans completed
- 27,000 Enterprises created
- 132,000 Jobs created

Developing entrepreneurial innovation in existing SMEs

- Specialised and hands-on assistance provided to 25,000 SMEs
- 17,000 innovation diagnostics completed
- 72,000 SMEs attended training schemes run by BICs
- 39,000 SMEs involved in innovative programs

Maximising efficiency and synergy among entrepreneurial innovation service providers

- 300,000 projects sign-posted
- 3,200 programmes designed and implemented
- 11,300 awareness events organized by BICs
- 192,000 attendees to BICs events

Such measures (and figures) reported above are however perhaps more revealing of the nature of BIC activity, as opposed to supporting a meaningful evaluation of their contribution in either qualitative or quantitative terms i.e. there is no effort to compute, for example, value for money (vis-à-vis inputs) or with

---

[1] EBN (2005) 'EBN 2004 BIC Observatory – An overview of the BIC approach in its 20th year', retrieved on 27.03.05 from website: http://quality.ebn.be/Documents/2004%20BIC%20Observatory.pdf p. 22

reference to other schemes or modalities, nor are the results disaggregated to permit comparable assessments of one BIC against another. More generally, while for example an incubator such as NEBIC may be required from time to time to report outputs and outcomes against such frameworks and measures by funding agencies in respect of discrete projects, these measures are not applied to the whole of NEBIC operations.

In any event, it is submitted that such quantitative measurements (as applied within or to the incubator community) are rarely properly or adequately descriptive i.e. job creation figures may or may not relate to high value-added/quality jobs or reveal, of themselves, the local conditions in which the result has been achieved (to say nothing of attribution and the basis upon which job creation claims are being made). For example, a high rate of start-ups may of itself be impressive but less so if survival rates are poor or if these start-ups evolve into only marginal survivors or are in fact only lifestyle businesses with no ambition for growth, employment generation, innovation, etc. Further, in the course of this research, on more than one occasion it has been queried, perhaps legitimately, as to whether it is possible, desirable, meaningful or legitimate to apply classical evaluation frameworks that might, for example assess costs per output in a deprived community or less-favoured region (characterised by significant market failures) against the input/outputs achieved in a more naturally abundant communities (i.e. rich in human capital, intellectual/innovation assets and other regional/local endowments (e.g. vigorous public/private sector research base)) and moreover, whether it is worth the effort!

As regards those incubators observed in the course of this research as offering and reporting quantitative estimations of economic effects e.g. gross impacts, they rarely consider additionality or adjustments for displacement and indirect effects. Further those that do offer estimates of net effects vis-à-vis for example job creation, cost-per-job created/protected seemingly presume a very linear relationship between cause and effect. In addition, such figures are generally allowed to stand without any interpretation as there is little or no frame of reference to assess whether such results represent an unparalleled return on the activity or investment or are no more or less than might be expected with/without

reference to other available modalities i.e. it might be said that they report activity as much as achievement, but again there is nothing against which to judge these reports.

In general, it is evident from this research that most incubators (European and UK) do not use sophisticated methods or highly quantifiable or comparable techniques to document and/or validate their impact and/or the degree and extent to which they have 'added-value'. Evidently, many incubators do however rely on the positive press associated with their incubator, client testimonials and success stories which are highlighted and widely disseminated to stakeholders, sponsors, peer groups and associations within and outwith the business support/incubator community and the locality served by the incubator to communicate impacts and added value.

Figure 6.1: Example: North East Business and Innovation Centre

'Bakers Save Their Dough'

A local factory has used its loaf to slice rising costs and save over £9,000 per year. Allied Bakeries, based on Team Valley in Gateshead, supplies bread, including Kingsmill, Allinson, and Sunblest, across the UK and when some of their packaging was modified to a wax based paper they decided to review their processes in order to save operator time. David Hunt (33), Plant Engineer and Manager, has worked at the factory for over seventeen years where he began his career as an apprentice. He commented: "We were loosing hundreds of loaves a day as they got damaged on the production line and additional checks tied our operators up for hours at a time when they were needed elsewhere in the factory. We were particularly concerned about the increasing level of wastage during the production process and so approached the North East Business and Innovation Centre's (BIC) Product and Process Development Unit (PPDU) for support. The PPDU engineers redesigned our conveyor system to reduce damage by ensuring there was a smooth transportation of loaves from the wax wrapping machine to the checkweigh. These adjustments have made this process much more efficient and cost effective as loaves are no longer being damaged."

The PPDU offers constructive appraisal of production processes and equipment to economically and safely achieve more efficient production. Recognised by the DTI's Manufacturing Advisory Service as a Centre of Expertise in Manufacturing the PPDU is staffed by a strong team of mechanical, electrical, electronics and industrial design engineers, all of whom are keen to keep up with advances in technology.

Peter Warriner, Electrical Engineer, commented: "Often it takes another set of eyes to find a simple solution to a problem that could be costing a company thousands of pounds. It has been fantastic to work with Allied and I am thrilled that we have found a way to save them so much money and cut down waste."

Incubators employ a variety of media that include, the internet, features in local and regional press, circulars (paper and online) and with varied circulations (local, regional, pan-european) and/or contribute to others, events within and outwith the region served by the incubator and award schemes which aside from promoting and rewarding innovation, recognizing indigenous assets, etc also engage stakeholders, sponsors in a high visibility example of incubator activity as regards one of the ways incubators (and stakeholder/sponsors, collectively) add value. Many incubators do however prepare annual report(s) featuring notable accomplishments, outcomes, the progress of strategies and plans with reference to local conditions and their regional/local mandate(s). Such reports also feature relatively limited quantitative information that may or may not include statements and/or an explication of income and expenditure, number of jobs and enterprises created, number of businesses assisted (and featuring the nature, level and outcome of selected examples of assistance), occupancy rates, and tenant surveys. Such reports tend to have a varied and sometimes restricted circulation.

The most likely explanations advanced in the course of this research for the fact that incubators do not produce such detailed studies of their own activity or that detailed studies have not been carried out, have included:

- Stakeholders and/or sponsors (i.e. that matter) are evidently content - for the moment - with incubator performance as currently reported (they do not require any more sophisticated reporting or they accept that howsoever 'sophisticated' an alternative evaluation framework might be, it will nevertheless have no additional utility – for example - there is no framework or data against which to judge results);
- Stakeholders and/or sponsors are not satisfied that other more rigorous metrics or considerations will dispose satisfactorily of the cause-effect issue and that such efforts will produce nothing other than protracted academic discourse as regards attribution. Kuratko and Lafollette (1987, p. 49-55) query attribution and note that incubator results may be no more than a product or factor of the degree and extent to which the incubator has been adept at screening and selecting the firms they support. This concept is developed by Bearse (1998, p.322-333) who queries and compares the selection of incubatees and the selection of students for admission to Harvard University. Bearse queries whether Harvard students (the incubatees) achieve success because of the Harvard experience/environment or because Harvard has selected students who would be successful in any event. It is noted that attribution and the difficulties in establishing a legitimate claim to causation and effect is not meaningfully pursued or disposed of in practitioner reporting;
- By incorporating and engaging the expectations, interest and support of their constituents incubators and stakeholders/sponsors are partners in the incubation process. Stakeholders and/or sponsors are tied into, or are active in, incubator activity and therefore share responsibility for success and failure and in any event it is in the mutual interest of all parties to agree upon the success of the modality and promote the same.
- There is a level of mutual appreciation, respect and understanding, between stakeholders and/or sponsors and incubation personnel that regardless of outcomes, incubator activity represents an earnest and genuine endeavour (especially in the absence of genuine alternatives);
- Incubation is perceived and accepted as a successful modality. Not only do incubators provide a physical manifestation of policy they also

produce physical exemplars as representative of the fruits of their labours. This is as important for stakeholders and/or sponsors as the incubator personnel directly involved in the incubation process who bask in the reflected glory of individual incubatee achievements;

- Stakeholders and/or sponsors accept or understand that incubators rarely have the time, resources or the inclination to devote to protracted introspection to say nothing of 'as to what end or purpose' could such data and analysis be put.
- The nature or organisation of the industry does not lend itself to the imposition of evaluation metrics that are overly prescriptive or rigid and fail to capture the nature and level of incubator interventions in all their variety.
- Further, while there are those that might wish to evaluate the performance and contribution of incubators they generally lack the influence and authority (including national, regional and local government) across the industry to require incubators to co-operate with or submit to detailed scrutiny. In any event, as noted above, it has also been suggested that incubators are reluctant to submit to evaluations, metrics or standards that unduly fetter their operations or surrender their independence to a would-be over-arching executive or regulatory authority, a point seemingly acknowledged by the UK Government and acknowledged by Lord Sainsbury's announcement of the 'Quality Benchmarks for Business Incubators': "[there] is evidence that the business incubation community is maturing - that they want something to measure themselves against...However, there have also been concerns expressed within the incubation community about the introduction of a standard. At national level, we have listened to these concerns and I would like to reassure those people that it is not our intention to impose the standard upon you. We recognise that incubators will always be at various stages of development and not all will be able to meet the criteria of a standard from the outset. The sensible and most pragmatic way forward, in my view, is to proceed on an evolutionary basis and allow stakeholders, partners and the

incubation community, to determine the pace of progress according to individual circumstances.[2]

Notwithstanding, such reservations and a general lack of detailed evaluations of incubator performance, incubators and particularly BICs are credited with and/or claim a range of qualitative and quantitative effects. As regards an example of the former, BICs are said to have made a meaningful contribution to supporting a move from top-down approach to regional development (largely characterised by public interventions designed to facilitate transfers of mobile capital and jobs from prosperous or prospering regions to underdeveloped or declining regions), to a bottom-up approach focused on maximising the indigenous potential for economic development and led by those at the interface between public policy and the provision of direct support. Further, as reported by the European Commission Directorate-General for Regional Policy's External evaluation study of the BIC programme (1984-97)[3]:

- Compared with similar organisations, BICs carry out **outstanding work and are in tune with the needs of small businesses** and potential entrepreneurs in the less-favoured regions. This is thanks to a common model governed by Community standards, a European network and an evaluation procedure, all rewarded by a European quality label.
- Their integrated business advisory services **are perfectly suited to the development of innovative policies** in the Member States which has allowed them to participate in the implementation of Structural Funds measures and in other Community programmes in favour of SMEs, including ERDF Article 10 pilot projects.
- The public/private partnerships that support BICs, usually with a majority public interest, **can have a great influence at the interface between public policy and private interests.** At the same time,

---

[2] Retrieved on 19.04.2005 from DTI website:
http://www.dti.gov.uk/ministers/speeches/sainsbury101103.html

[3] European Commission Directorate-General for Regional Policy's External evaluation study of the BIC programme, cited in European Commission Guide to European Business Innovation Centres Factsheet 5

operational BICs get their resources to implement measures in favour of SMEs both from the market, i.e. by providing services to businesses, and from public bodies. A large portion of BICs also have access to risk-capital for financing innovative projects.

As regards, an example of the latter, EBN (2004) reports that in 2003 155 BICs providing business start-up creation and incubation support AND business and innovation support to existing SMEs were responsible for:

Table 6.1

Total	BIC Collective Interventions (2003)	Average per BIC (155) (Mean)
64,000	Contacts with potential entrepreneurs	412.9
14,000	Projects/business ideas investigated i.e. feasibility studies undertaken	90.3
6,000	Business plans completed	38.7
3,800	Business start-ups facilitated or assisted	24.5
10,500	Jobs created during the business start up phase	67.7
3,200	BIC tenant businesses	20.6
17,400	Jobs created by businesses hosted by BIC incubators (after the start up)	112.2
26,000	People attending training seminars for potential entrepreneurs	167.7
16,000	Existing businesses supported by the BICs	103.2
9,000	Business supported with strategic advice and guidance	58
2,300	SME innovation diagnostics	14.8
6,000	SMEs involved in BIC programmes, initiatives or schemes	38.7
10,000	SMEs benefited from a BIC training programme	64.5

Source Data: EBN 2005[4]

[4] Source Data: EBN (2005) 'EBN2004 BIC Observatory – An overview of the BIC approach in its 20th year, retrieved on 06.05.2005from EBN website http://quality.ebn.be/Documents/2004%20BIC%20Observatory.pdf

Again while descriptive of the nature of selected activity, the level of impact/added value is difficult to discern, as for example the aforementioned outputs and outcomes are not subject to comparative assessment.

6.4 The Contribution of NEBIC (Local added value and Impact)

As regards the performance and contribution of the North East Business Innovation Centre, a number of qualitative and quantitative indicators were selected against which to report NEBIC's local added value or impact. The former were selected so as to capture and define the nature of NEBIC operations i.e. develop an overview as to the nature of NEBIC's contribution or 'added-value' in the locality and region. The Quantitative measures were selected as they generally accord with economic development programme metrics against which to report activity.

6.4.1 Qualitative Indictors

NEBIC's general aims and objectives are explored in Case Study 1 (Chapter 4). Plotted against the framework of incubator objects as developed in Chapter 5, NEBIC was found to generally deliver a programme of activities and endeavour that may be said to reflect 36 of the 38 objects presented below.

Table 6.2: Incubator Objects	NEBIC
1. Contribution to national, regional and local economic development	✓
2. Enhancing industrial competitiveness and profitability	✓
3. Building or accelerating growth of a local industry/sector(s)	✓
4. Wealth creation and concomitant increase in tax revenues	✓
5. Remediation and re-use of industrial (derelict) sites and real estate development	✓
6. Re-use of redundant (landmark) buildings	✗
7. Rural/Urban industrial regeneration, restructuring or development	✓
8. Revitalising distressed neighbourhoods	✗
9. SME creation and development (and improved rates thereof)	✓

10. Retaining businesses in the local economy	✓
11. Technology development and transfer	✓
12. Innovation and commercialisation of technology	✓
13. Supporting the innovation process	✓
14. Combating Unemployment	✓
15. Employment creation (and safeguarding employment)	✓
16. Graduate retention (and/or retention of skilled personnel)	✓
17. Providing a supportive environment for entrepreneurs	✓
18. Stimulating, mobilising and assisting entrepreneurship	✓
19. Enhancing a communities entrepreneurial climate and the value it attributes to entrepreneurship and innovation	✓
20. Increased community pride and self-esteem	✓
21. Cultural change (promoting creativity, entrepreneurship and innovation	✓
22. Community development/Empowering disadvantaged communities to develop social enterprises	✓
23. Assisting socially disadvantaged groups - such as youth and minorities -, promote niche sectors including music and the arts	✓
24. Identifying and supporting spin-in and spin-out business opportunities	✓
25. Supporting academic, student/graduate entrepreneurship	✓
26. Supporting and promoting the commercialisation of university research and strengthening interactions between university-research-industry	✓
27. Provision of Education, Training and Continuous Professional Development	✓
28. Research, teaching and learning	✓
29. Facilitating institutional linkages (Business-education, Business-Science, Innovation and Research)	✓
30. Upgrading the indigenous research base and the technological standing of firms in a given locality	✓
31. Expanding and/or co-ordinating the supply of business support infrastructure	✓

32. Generating Net Income for the Incubator or sponsoring organisation(s), founders and investors	✓
33. Supporting indigenous businesses to access finance (including grants) and attract investment including FDI and joint venturing opportunities	✓
34. Supporting cluster strategies and plans	✓
35. Enhancing vertical and horizontal linkages (within and outwith supply chains), particularly collaboration between large and small firms	✓
36. Promoting national/regional technology, products and services;	✓
37. Retaining businesses in the local economy;	✓
38. Attracting businesses to the local economy and supporting inward investment strategies/initiatives;	✓

While the Case Study and the framework of objects above describes, the nature of BIC activity it does little however to illuminate the impact of the incubator within the locality or region e.g. in macro-economic or micro-economic terms.

6.4.2 Quantitative Indicators

The Operations Director David Howell reports that the BIC, "home to 156 companies with a collective turnover of £40million+ and has, in the last 10 years (as measured on November 10, 2004), supported 2,053 companies with a combined turnover of £300million+". In an effort, however, to better understand and quantify NEBIC activities a reporting framework was developed against which incubator activities for the period 2004/2005 were plotted.

Table 6.3: Performance Outputs NEBIC 2004/2005

Enterprise creation	
Enterprise creation with individual entrepreneurs	300
Development of existing SMEs	500
Industrial spin-offs facilitated or assisted	10
Academic spin- facilitated or assisted	10
Business/Project Opportunities	
Projects screened	500
Projects selected for support	300
Technological based projects i.e. "Technology push"	50
New non-technological activities (marketing, financing, quality, internationlisation...) considered as "innovative" for the catchment area i.e. "Market Pull"	50
Others (non-innovative)	-
Profile of projects launched in 2004 by new and existing enterprises	
Number of enterprises assisted with innovative projects	100
Number of enterprises assisted with innovative/innovation diagnostics	85
% comprising Technological innovation	75
% Non technological innovation (services, local development oriented)	25
% Other	
% technology pushed	75

As may be observed from the table above, the BIC supported both new venture creation and existing SMEs. Approximately 60% of business development projects assessed by NEBIC received support from NEBIC in one shape or form. 20% of projects were said to comprise an innovation of which 75% comprised a technological innovation. As illustrated, in the table below, 60% of business development projects assisted originated within the ICT sector, 12% in the Life sciences, genomic & biotech for health sector and 12% concerned Mechantronics.

Table 6.4: Profile of innovative projects by sector

(By new and existing enterprises)	%
Life sciences, genomic & biotech for health	12
ICT/IT	60
Nano technologies, nano-sciences, micro-systems	8
Agro+Agri Technologies (Food quality & safety, packaging, agriculture)	0
Energy and environmental technologies	8
Advanced materials	0
Mechantronics	12
Other	0

However, while these reports describe the nature and profile of NEBIC 'added value' activities, they too however do little to enhance understanding as to their nature and level of impact in real terms. NEBIC was therefore invited to report cumulative effects or historical impacts as presented below:

Table 6.5: Historical Impacts

NEBIC	
Nos. of enterprises created with BIC assistance since BIC created	3,500
Nos. of jobs created by these enterprises	7,500
% of enterprises created with BIC support surviving after 3 years	75%
Nos. of tenants located at the BIC	160
Nos. of incubatees that have passed through incubator since BIC created	400
Total number of employees of tenant businesses	1,125

Computing basic economic effects of job creation as reported above and using the average salary for north-east (£20,353[5]) - and notwithstanding debates as to additionality and or attribution - NEBIC might lay claim to, for example, responsibility for/being instrumental to personal income generation of the order of £114,485,625 ((£20,353 x 7,500 jobs) x 0.75 (adjusting for business failures (see

[5] The Guardian Online 'Londoners wealthiest in UK' Wednesday February 16, 2005 http://money.guardian.co.uk/pay/story/0,13871,1415864,00.html

above)); and personal taxation (NI and Income Tax) calculated on basis of single persons tax code (489L) and at the basic rate of tax (24% of salary - 15% PAYE income tax and 8% National Insurance Contributions) of £27,476,550, to say nothing of indirect effects (i.e. job creation in supplier businesses). In a similar vein, a calculation of income generation amongst BIC tenants for this year might also be made (£20,353 x 1,125 (full-time equivalent posts) = £22,897,125 that in turn generates £5,495,310 for the state (Income Tax and National Insurance)).

In addition, in calculating the number of jobs safeguarded in NEBIC client companies this year as reported by NEBIC, a value may also be placed on the incomes so protected and the taxes preserved (£20,353 x 1000 = £20,353,000 (Personal Incomes) and £4,884,720 (Income Tax and National Insurance). Again, however, while according these activities or rather outputs 'economic values', as measures of incubator performance they nevertheless do not adequately illuminate NEBIC's impact (or otherwise) on assisted businesses.

To this end, an interview questionnaire was devised to investigate the following hypotheses and/or queries in an effort to ascertain the impact of incubators on incubated firms (relative to other firms located in other incubators and non-incubated firms), i.e. whether the conduct, values, etc, of their business differed from non-incubated firms:

6.5 Hypotheses/Queries to identify different behaviours between incubated and non incubated firms vis-à-vis innovation and general conduct of their businesses

The hypotheses were evolved with reference to (i) incubators are generally believed to prioritise innovation in the way they select the businesses they support and (ii) key 'values' or 'behaviours generally considered to promoted or supported by business incubators and/or instilled in their tenants as best business practice.

1. Incubated firms are more innovatory than non-incubated firms (as measured by novelty);
2. Incubated firms are more innovatory than non-incubated firms (as measured by their propensity to innovate);
3. Incubated firms are more likely to invest/incur business expenditure related to R&D (BERD);
4. R&D/Innovation effort is more likely to be commercial i.e. market led/focused in incubated firms and the than non-incubated firms;
5. Innovation within incubated firms is more likely to be the outcome of strategies and plans than non-incubated firms; and
6. Incubated firms are more likely to accord a value (a higher value) to product/service innovations and, for example, their role in/importance to extending product/service ranges, market share and penetration and quality than non-incubated firms
7. Incubated firms are more likely to accord a value (a higher value) to process innovations and, for example, their role in/importance to reducing operating costs (materials, energy and labour), improving flexibility and increasing capacity.
8. Incubated firms are more likely to lever public support or collaborate in the development of innovatory products and processes than non-incubated firms.

6.6 Hypotheses/Queries to identify different behaviours between incubated and non incubated firms vis-à-vis the general conduct of their business

9. Incubated firms are more likey to adopt flatter management structures.
10. Incubated firms are more likely to value and protect IPR than non incubated firms
11. Incubated firms are more likely to employ ICT in their business, particularly advanced ICT applications;
12. Incubated firms are more likely to be quality conscious and have secured quality accreditation than non-incubated firms;
13. Incubated firms are more likely to engage with and avail themselves of public support for business and technology development;
14. Incubated firms are more likely to have experienced growth than non-incubated firms as measured by increases in turnover; and
15. Incubated firms are more likely to have experienced growth than non-incubated firms as measured by increases in employment.

6.7 Data Analysis: About the Sample

The sample (respondent profile) comprised 78 firms located in business incubators in the North East of England and 124 businesses located in the North East but outwith business incubator environments. The data collected by postal survey, telephone interview and face-to-face interviews, was disaggregated and is presented by type of respondent i.e. resident at an incubator in the North East, and resident within the North East but outwith all business incubator environments. SPSS was used to cross-tabulate the data and calculate the Chi-Square (a probability level equal to or less than 0.05 was considered to be significant). In addition, where as a consequence of the sample size the calculation of the Chi-Square returned a result where one or more cells had an expected count less than 5, this is noted and reflected in the analysis and the conclusions drawn hereafter.

Therein, the average size of firms per size class (as measured by total employment) was, as follows:

Table 6.6: Respondent Size as measured by total employment (Average)

	Full-time Equivalents		
N=No. of Cases	**Mean**	**Median**	**Total N**
Incubator Respondents	12.38	7	78
Non-incubated Respondents	25.29	11.50	124

While the difference in size of firm as between types of respondent (Median) may not appear significant the difference between their relative turnovers is, as illustrated below, more marked:

Table 6.7: Respondent Size as measured by total turnover (Average)

	Turnover		
N=No. of Cases	**Mean**	**Median**	**Total N**
Incubator Respondents	924,714	250,000	42
Non-incubated Respondents	3,116,933	780,000.00	60

The data presented in the table above, relates to values as reported by almost half of the respondents (there was a general reticence amongst respondents to disclose financial information relating to their business). It may nevertheless be observed that turnover, as reported by incubator respondents compared to non-incubated firms was substantially less than half of the latter. The difference might be explained by the apparent difference in their respective trade histories or rather their longevity.

As illustrated below, there are significant differences between both the types of respondent. Interestingly their is a presumption in much of the literature that incubation is/should be a three-year process and yet the median age of incubator respondents was 5 years.

Table 6.8: Average Age of Respondent Businesses

N=No. of Cases	**Mean**	**Median**	**Total N**
Incubator Respondents	8.23	5	77
Non-incubated Respondents	27.74	16	123

6.7.1 Innovation and Novelty: Product Innovators

Hypothesis 1: Incubated firms are more innovatory than non-incubated firms (as measured by novelty).

Respondents were invited to report whether product innovation had occurred within their business in the last two years and, if so, characterize the level of novelty i.e. whether product innovations occurring in the business were merely new to their firm, and/or were new to their market, and/or new to their industry.

Table 6.9: Innovation and Novelty: Product Innovators

N=No. of Cases	No		Yes		
New to their Firm	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	46	58	33	42	79
Non-incubated Respondents	72	58	53	42	125
Pearson Chi-Square	**.008(b)**				
Asymp. Sig. (2-sided)	**.930**				
Continuity Correction (a)	**.000**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 33.30					

N=No. of Cases	No		Yes		
New to their Market	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	57	73	21	27	78
Non-incubated Respondents	115	92	10	8	125
Pearson Chi-Square	**13.292(b)**				
Asymp. Sig. (2-sided)	**.000**				
Continuity Correction (a)	**11.870**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 11.91					

N=No. of Cases	No		Yes		
New to their Industry	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	58	74	20	26	78
Non-incubated Respondents	124	99	1	1	125
Pearson Chi-Square	**31.956(b)**				
Asymp. Sig. (2-sided)	**.000**				
Continuity Correction (a)	**29.334**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 8.07					

Using SPSS to conduct bivariate analyses and calculate the Chi-Square was calculated for the two types of respondent reporting product innovations 'New to their firm', 'New to their market' and 'New to their industry'. A significant relationship was noted as regards respondents reporting product innovations 'New to their market' and 'New to their industry' with proportionately more incubator respondents than non-incubated respondents reporting product innovation 'new to their market' (27% of incubator respondents compared to 8% non-incubated respondents) and New to their industry' (26% of incubator respondents compared to 1% of non-incubated respondents).

6.7.2 Innovation and Novelty: Process Innovators

Hypothesis 1: Incubated firms are more innovatory than non-incubated firms (as measured by novelty.

Respondents were invited to report whether process innovation had occurred within their business in the last two years and, if so, characterize the level of novelty i.e. whether process innovations occurring in the business were merely 'new to their firm', and/or were 'new to their market', and/or 'new to their industry'. Using SPSS to calculate the Chi-Square for the two types of respondents reporting process innovations 'New to their firm', 'New to their market' and 'New to their industry' (as illustrated in Table 6.10 below), a significant relationship was found as regards respondents reporting process innovations 'New to their market' and 'New to their industry' with 31% of incubator respondents reporting process innovation 'New to their market' compared to 14% of non-incubated respondents and 23% of incubator respondents reporting process innovation 'New to their industry' compared to 3% of non-incubated respondents. As regards respondents reporting process innovations 'new to their industry', however, it is noted than one of the cells had an expected count less than 5 and this is reflected in the analysis.

Table 6.10: Innovation and Novelty: Process Innovators

N=No. of Cases	No		Yes		
New to their Firm	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	30	60	20	40	50
Non-incubated Respondents	23	58	17	42	40
Pearson Chi-Square	**.057(b)**				
Asymp. Sig. (2-sided)	**.811**				
Continuity Correction (a)	**.001**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 16.44					

N=No. of Cases	No		Yes		
New to their Market	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	27	69	12	31	39
Non-incubated Respondents	12	86	2	14	14
Pearson Chi-Square	**6.967(b)**				
Asymp. Sig. (2-sided)	**.008**				
Continuity Correction (a)	**5.479**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 6.42					

N=No. of Cases	No		Yes		
New to their Industry	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	30	77	9	23	39
Non-incubated Respondents	32	97	1	3	33
Pearson Chi-Square	**6.006(b)**				
Asymp. Sig. (2-sided)	**.014**				
Continuity Correction (a)	**4.447**				
a Computed only for 2x2 table b 1 cells (25.0%) have expected count less than 5. The minimum expected counted is 4.58					

6.7.3 Innovation and Novelty: Administrative Innovators

Hypothesis 1: Incubated firms are more innovatory than non-incubated firms (as measured by novelty.

Respondents were also invited to report whether administrative innovations had occurred within their business in the last two years and, if so, characterize the level of novelty i.e. whether administrative innovations occurring in the business were merely 'new to their firm', and/or 'new to their industry'. As regards administrative innovations and the degree of novelty therein, incubated firms again

reported higher incidence of innovation than non-incubated firms. 54% of incubator respondents reported administrative innovations 'new to their firm' and 21% administrative innovations 'new to their industry' compared to 25% and 12% of non-incubated respondents, respectively.

Table 6.11: Innovation and Novelty: Administrative Innovators

N=No. of Cases	No		Yes		
New to their Firm	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	21	46	25	54	46
Non-incubated Respondents	15	79	4	21	19
Pearson Chi-Square	**6.032(b)**				
Asymp. Sig. (2-sided)	**.000**				
Continuity Correction (a)	**4.760**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 8.48					
N=No. of Cases	**No**		**Yes**		
New to their Industry	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	27	75	9	25	36
Non-incubated Respondents	15	88	2	12	17
Pearson Chi-Square	**1.230(b)**				
Asymp. Sig. (2-sided)	**.014**				
Continuity Correction (a)	**.557**				
a Computed only for 2x2 table b 1 cells (25.0%) have expected count less than 5. The minimum expected counted is 3.53					

Again, using SPSS to conduct bivariate analyses, and to calculate the Chi-Square for the two types of respondent reporting administrative innovations 'New to their firm' and 'New to their industry', as illustrated in Table 6.11 (above), a significant relationship was found as regards respondents reporting administrative innovations 'New to their firm'. No significant relationship was found in relation to administrative innovations 'New to their Industry'.

6.7.4 Innovation and Novelty: General

Hypothesis 1: Incubated firms are more innovatory than non-incubated firms (as measured by novelty.

Finally, as regards the level of innovation i.e. novelty, respondents were also invited to characterise innovation(s) as occurring within their businesses (in the last two years) as to whether they amounted to:

- New and Original Breakthroughs advancing the state of the art in their industry or technology; or
- Extensions of the businesses own products, processes or practices to which the firm is making incremental improvements on a continuous basis; or
- The introduction of products, processes or practices which the firm has observed elsewhere and has sought to adopt and adapt the same (i.e. not just copying but adapting/improving it – adding new features/stripping out features) and introduce it to customers; or
- The introduction of products, processes or practices which have been observed elsewhere and adopted (copied/mirrored) and introduced by the business (observed elsewhere e.g. competitor/non-competitor businesses, business journal, newspaper, industry best practice exemplars, etc).

The responses are presented below.

As is evident from the responses collected and presented above (Tables 6.9-11), in general terms, more incubated respondents reported a higher level of novelty than non-incubated respondents. Prima facie, it therefore appears that incubated firms are more innovative as measured with reference to the novelty reported by them as inherent in their product and/or process and/or administrative innovations.

Using SPSS to calcuate the Chi-Square for the two types of respondent vis-à-vis the level (novelty) of innovation they reported (Table 6.12) a significant relationship was found for the two types of respondents reporting 'New & Original Breakthrough(s)' and 'Adoptions'. With proportionately more incubator respondents reporting the former (19%) than non-incubated respondents (7%).

Table 6.12: Novelty: Respondents reporting innovation(s) as...

N=No. of Cases	No		Yes		
New & Original Breakthrough(s)	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	54	81	13	19	67
Non-incubated Respondents	55	93	4	7	59
Pearson Chi-Square	**4.283(b)**				
Asymp. Sig. (2-sided)	**.038**				
Continuity Correction (a)	**3.270**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 7.96					

N=No. of Cases	No		Yes		
Extension of own product(s)/service(s)	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	23	34	45	66	68
Non-incubated Respondents	21	34	41	66	62
Pearson Chi-Square	**.000(b)**				
Asymp. Sig. (2-sided)	**.995**				
Continuity Correction (a)	**.000**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 20.98					

N=No. of Cases	No		Yes		
Adapted Adoptions	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	59	88	8	12	67
Non-incubated Respondents	45	76	14	24	59
Pearson Chi-Square	**3.025(b)**				
Asymp. Sig. (2-sided)	**.082**				
Continuity Correction (a)	**2.263**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 10.30					

N=No. of Cases	No		Yes		
Adoptions	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	63	94	4	6	67
Non-incubated Respondents	49	83	10	17	59
Pearson Chi-Square	**3.829(b)**				
Asymp. Sig. (2-sided)	**.050**				
Continuity Correction (a)	**2.798**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 6.56					

It was expected that incubated firms at least would, by their very nature, exhibit more innovative behaviours (i.e. it is assumed that incubators are focused on supporting only/the most innovative businesses - see also Chapter 4). However, as explained in Chapter 4 this is not prescribed. Indeed, a number of other factors are considered when, for example, NEBIC selects a firm to support.

6.7.5 Innovation and Propensity to Innovate: Product Innovators

Hypothesis 2: Incubated firms are more innovatory than non-incubated firms (as measured by their propensity to innovate).

Respondents were also invited to report their propensity to innovate i.e. whether innovation is a continuous aspect of their business, regularly recurring, occasional or rare. The results are presented below as per product, process and administrative innovators.

Table 6.13 Propensity to Innovate: Product Innovators

N=No. of Cases	No		Yes		
Constant	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	16	37	27	63	43
Non-incubated Respondents	64	88	9	12	73
N=No. of Cases	No		Yes		
Regular	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	34	79	9	21	43
Non-incubated Respondents	64	88	9	12	73
N=No. of Cases	No		Yes		
Occasional	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	36	84	7	16	43
Non-incubated Respondents	54	74	19	26	73
N=No. of Cases	No		Yes		
Rare	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	43	100	0	0	43
Non-incubated Respondents	37	51	36	49	73
Pearson Chi-Square	45.846(a)				
Asymp. Sig. (2-sided)	.000				
Continuity Correction	-				
a 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.67.					

As may be observed from the data presented above, incubated businesses reporting product innovation also reported a higher propensity to innovate than non-incubated businesses. Using SPSS to conduct bivariate analyses and calculate the Chi-Square for the two types of respondent, a significant relationship was found for the types of respondents and their propensity to innovate new products. As may be observed from Table 6.13 (above), proportionately more of the incubator respondents reported that product innovation was constant or regular while a higher proportion of non-incubated respondents reported that product innovation was only occasional or rare.

6.7.6 Innovation and Propensity to Innovate: Process Innovators

Hypothesis 2: Incubated firms are more innovatory than non-incubated firms (as measured by their propensity to innovate).

Prima facie, as is evident from the data presented below, incubated businesses reporting process innovation, also report a higher propensity to innovate than non-incubated businesses:

Table 6:14 Propensity to Innovate: Process Innovators

N=No. of Cases	No		Yes		
Constant	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	7	27	19	73	26
Non-incubated Respondents	59	95	3	5	62
N=No. of Cases	No		Yes		
Regular	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	21	81	5	19	26
Non-incubated Respondents	59	95	3	5	62
N=No. of Cases	No		Yes		
Occasional	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	26	100	0	0	26
Non-incubated Respondents	55	89	7	11	62
N=No. of Cases	No		Yes		
Rare	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	24	92	2	8	26
Non-incubated Respondents	13	21	49	79	62

Pearson Chi-Square	**57.315(a)**
Asymp. Sig. (2-sided)	**.000**
Continuity Correction	**-**
a 3 cells (37.5%) have expected count less than 5. The minimum expected count is 2.07.	

Using SPSS to conduct bivariate analyses and calculate the Chi-Square for the two types of respondent, a significant relationship was found between the types of respondents and their propensity to innovate new processes. As may be observed from the Table above, like the propensity to innovate new products, proportionately more of the incubator respondents reported that process innovation was a constant or regular feature of their business while a higher proportion of non-incubated respondents reported that process innovation was only occasional or rare. It is noted however that three of the cells (above) had an expected count less than 5.

6.7.7 Innovation and Propensity to Innovate: Administrative Innovators

Hypothesis 2: Incubated firms are more innovatory than non-incubated firms (as measured by their propensity to innovate).

Finally, respondents were also invited to report the propensity to generate administrative innovations in their business.

Table 6.15: Propensity to Innovate: Administrative Innovations

N=No. of Cases	No		Yes		
Constant	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	15	48	16	52	31
Non-incubated Respondents	52	96	2	4	54
N=No. of Cases	No		Yes		
Regular	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	26	84	5	6	31
Non-incubated Respondents	53	98	1	2	54
N=No. of Cases	No		Yes		
Occasional	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	24	77	7	23	31
Non-incubated Respondents	53	98	1	2	54

N=No. of Cases	No		Yes		
Rare	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	28	90	3	10	31
Non-incubated Respondents	4	74	50	26	54
Pearson Chi-Square	**57.739(a)**				
Asymp. Sig. (2-sided)					
Continuity Correction	**-**				
a 3 cells (37.5%) have expected count less than 5. The minimum expected count is 2.19.					

Again incubated firms, proportionately, reported a higher propensity to innovate than non-incubated firms. Using SPSS to conduct bivariate analyses and calculate the Chi-Square for the two types of respondent no relationship was found as between the types of respondents and their propensity to innovate administrative innovations.

6.7.8 Innovation and Investment in R&D (BERD)

Hypothesis 3: Incubated firms are more likely to invest/incur business expenditure related to R&D (BERD).

As regards the priority accorded innovation by indigenous businesses, respondents were invited to indicate whether they incurred expenditure on R&D in the last two years in the pursuit of product, process or administrative innovations. As may be observed from Table 6.16 (below), a greater proportion of incubated businesses reported expenditure on R&D (BERD) than non-incubated businesses.

Table 6.16: Respondents reporting investment in R&D (BERD)

N=No. of Cases	No		Yes		
In-House	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	35	58	25	42	60
Non-incubated Respondents	71	90	8	10	79
Pearson Chi-Square	**18.737(b)**				
Asymp. Sig. (2-sided)	**.000**				
Continuity Correction (a)	**17.035**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 14.24					

N=No. of Cases	No		Yes		
Acquisition of External R&D	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	44	73	16	27	60
Non-incubated Respondents	73	92	6	8	79
Pearson Chi-Square	**9.310(b)**				
Asymp. Sig. (2-sided)	**.002**				
Continuity Correction (a)	**7.934**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 9.50					

N=No. of Cases	No		Yes		
Acquisition of Machinery & Equipment	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	12	19	50	81	62
Non-incubated Respondents	63	80	16	20	79
Pearson Chi-Square	**50.885(b)**				
Asymp. Sig. (2-sided)	**.000**				
Continuity Correction (a)	**48.489**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 29.02					

N=No. of Cases	No		Yes		
Acquisition of external Knowledge	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	32	54	27	46	59
Non-incubated Respondents	75	95	4	5	79
Pearson Chi-Square	**32.121(b)**				
Asymp. Sig. (2-sided)	**.000**				
Continuity Correction (a)	**29.827**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 13.25					

N=No. of Cases	No		Yes		
Design functions	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	42	71	17	29	59
Non-incubated Respondents	76	96	3	4	79
Pearson Chi-Square	**17.056(b)**				
Asymp. Sig. (2-sided)	**.000**				
Continuity Correction (a)	**15.097**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 8.55					

N=No. of Cases	No		Yes		
Training	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	25	42	37	58	62
Non-incubated Respondents	73	92	6	8	79
Pearson Chi-Square	**44.456(b)**				
Asymp. Sig. (2-sided)	**.000**				
Continuity Correction (a)	**42.032**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 18.91					

N=No. of Cases	No		Yes		
Internal/External marketing	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	28	45	34	55	62
Non-incubated Respondents	74	94	5	6	79
Pearson Chi-Square	**40.853(b)**				
Asymp. Sig. (2-sided)	**.000**				
Continuity Correction (a)	**38.465**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 17.15					

Notwithstanding the fact, as expressed in chapter 2, that there are severe limitations in the utilty of BERD as a definitive descriptor of innovation or innovativeness, as illustated in Table 6.16 (above) proportionately more 'Incubator Respondents' reported BERD than 'Non-incubated Respondents'. Using SPSS to conduct bivariate analyses and calculate the Chi-Square for the two types of respondent, a significant relationship was found between the types of respondent reporting BERD, specifically 'In-House', 'Acquisition of External R&D', 'Acquisition of Machinery & Equipment', 'Acquisition of External Knowledge' 'Training' and 'Internal/External marketing'. With proportionately more incubator respondents than non-incubated respondents reporting expenditure on:

- R&D 'In-House' (42% compared to 10%, respectively);
- Acquisition of External R&D'(27% compared to 8%, respectively);
- Acquisition of Machinery & Equipment (81% compared to 20%, respectively);
- Acquisition of External Knowledge (46% compared to 5%, respectively);
- Training (58% compared to 8%, respectively)
- Internal/External marketing' (55% compared to 6%, respectively)

6.7.9 Innovation & Market Focus

Hypothesis 4: R&D/Innovation effort is more likely to be commercial i.e. market led/focused in incubated firms and the than non-incubated firms.

Aside from novelty and the intensity of innovation, respondents were invited to explain whether innovation in their business was 'market led/pull' or 'discovery-push' and whether innovation was generally the outcome of strategies and plans or more organic by nature. It was assumed that innovation in incubated firms was more likely to be market led/focused than non-incubated firms. A visual inspection of the data is not particularly telling.

Table 6.17: Innovation & Market Focus

N=No. of Cases	No		Yes		
Discovery-Push	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	38	59	26	41	64
Non-incubated Respondents	43	58	31	42	74
Pearson Chi-Square	**.023(b)**				
Asymp. Sig. (2-sided)	**.880**				
Continuity Correction (a)	**.000**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 26.43					
N=No. of Cases	**No**		**Yes**		
Market-Pull	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	28	44	35	56	63
Non-incubated Respondents	31	43	41	57	72
Pearson Chi-Square	**.026(b)**				
Asymp. Sig. (2-sided)	**.871**				
Continuity Correction (a)	**.000**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 27.53					

Moreover, when the Chi-Square was calculated using SPSS no significant relationship could be found.

6.7.10 Innovation as the outcome of strategies and plans

Hypothesis 5: Innovation within incubated firms is more likely to be the outcome of strategies and plans than non-incubated firms.

A greater proportion of incubator respondents reported that innovation was the outcome of strategies and plans in incubated firms than non-incubated firms. Using SPSS to conduct bivariate analyses and calculate the Chi-Square for both classes of respondent, no relationship could be found betweeen the type of respondent and whether innovation in respondent firms was the outcome of strategies and plans i.e. programmed.

Table 6.18: Innovation Programmed as part of a strategy or plan

N=No. of Cases	No		Yes		
Programmed	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	37	57	28	43	65
Non-incubated Respondents	45	67	22	33	67
Pearson Chi-Square	**1.471(b)**				
Asymp. Sig. (2-sided)	**.225**				
Continuity Correction (a)	**1.068**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 24.62					
N=No. of Cases	**No**		**Yes**		
Unprogrammed i.e. organic	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	32	50	32	50	64
Non-incubated Respondents	26	38	43	62	69
Pearson Chi-Square	**2.049(b)**				
Asymp. Sig. (2-sided)	**.152**				
Continuity Correction (a)	**1.579**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 27.91					

Moreover, no relation could be found as between the nature of innovations occurring as the outcomes of strategies and plans, and their degree of novelty, propensity to innovate or indeed growth (as measured by increases in employment or turnover).

6.7.11 Importance of Product Innovation.

Hypothesis 6: Incubated firms are more likely to accord a value (a higher value) to product/service innovations and, for example, their role in/importance to extending product/service ranges, market share and penetration and quality than non-incubated firms.

Respondents were invited to ascribe a value to the contribution product and/or service innovation had made to extending their product/service range(s), opening new markets/increasing market share, and enhancing quality.

Table 6.19: Importance of Product Innovation to...

N=No. of Cases	Not Significant		Significant		
Extending Product Range	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	10	23	33	77	43
Non-incubated Respondents	39	48	42	52	81
Pearson Chi-Square	**12.708(a)**				
Asymp. Sig. (2-sided)	**.005**				
Continuity Correction	**-**				
a 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.28.					

N=No. of Cases	Not Significant		Significant		
Opening new markets and/or increasing market share	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	11	26	31	74	42
Non-incubated Respondents	46	58	34	42	80
Pearson Chi-Square	**17.197(a)**				
Asymp. Sig. (2-sided)	**.001**				
Continuity Correction	**-**				
a 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.89.					

N=No. of Cases	Not Significant		Significant		
Improved quality	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	12	29	30	71	42
Non-incubated Respondents	38	48	42	52	80
Pearson Chi-Square	**13.812(a)**				
Asymp. Sig. (2-sided)	**.003**				
Continuity Correction	**-**				
a 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.23.					

Using SPSS to calculate the Chi-Square, a significant relationship was identified between the type of respondent and the reported importance of product innovation to 'Extending product range', 'Opening new markets and/or increasing market share' and 'Improving quality'.

Again, proportionately more 'incubator respondents' than 'non-incubated respondents' accorded a high importance to product innovation, specifically its role in 'Extending product range' (77% compared to 52%), 'Opening new markets and/or increasing market share' (74% compared to 42%) and 'Improving quality' (71% compared to 52%).

6.7.12 Importance of Process Innovation

Hypothesis 7: Incubated firms are more likely to accord a value (a higher value) to process innovations and, for example, their role in/importance to reducing operating costs (materials, energy and labour), improving flexibility and increasing capacity.

Further, respondents were also invited to consider the importance or significance of process innovations in their business and specifically the contribution of process innovation to efficiencies, economies and increasing flexibility and capacity. Again, using SPSS to conduct bivariate analyses, the Chi-Square was calculated for the two types of respondent vis-à-vis the importance ascribed by each type of respondent to process innovation vis-à-vis 'reduced materials/energy costs', 'improved flexibility', 'reduced labour costs', and 'increased capacity'. As may be observed from Table 6.20 (overleaf), a significant relationship between type of respondent and the importance accorded to process innovation's role in generating 'reduced materials/energy costs', 'improved flexibility', 'reduced labour costs', and 'increased capacity' was noted.

Table 6.20: Importance of Process Innovation...

N=No. of Cases	Not Significant		Significant		
Reduced materials/Energy costs	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	15	52	14	48	29
Non-incubated Respondents	65	97	2	3	67
Pearson Chi-Square	**35.883(a)**				
Asymp. Sig. (2-sided)	**.000**				
Continuity Correction (a)	**-**				
a 1 cell (25%) have expected count less than 5. The minimum expected count is .91.					
N=No. of Cases	**Not Significant**		**Significant**		
Improved flexibility	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	13	46	15	54	28
Non-incubated Respondents	61	91	6	9	67
Pearson Chi-Square	**30.486(a)**				
Asymp. Sig. (2-sided)	**.000**				
Continuity Correction	**-**				
a 0 ells (0%) have expected count less than 5. The minimum expected count is .59.					
N=No. of Cases	**Not Significant**		**Significant**		
Reduced labour costs	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	19	68	9	32	28
Non-incubated Respondents	67	100	0	0	67
Pearson Chi-Square	**33.789(a)**				
Asymp. Sig. (2-sided)	**.000**				
Continuity Correction	**-**				
a 1 cell (25%) have expected count less than 5. The minimum expected count is .59.					
N=No. of Cases	**Not Significant**		**Significant**		
Increased Capacity	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	11	39	17	61	28
Non-incubated Respondents	62	93	5	7	67
Pearson Chi-Square	**36.146(a)**				
Asymp. Sig. (2-sided)	**.000**				
Continuity Correction (a)	**-**				
a 0 cells (0%) have expected count less than 5. The minimum expected count is .88.					

As may be observed from the data presented above (Table 6.20), incubator respondents generally accorded process innovations a higher value than non-incubated respondents vis-à-vis their contribution to reducing materials/energy

costs (48% compared to 3%), reducing labour costs (54% compared to 9%) and improving flexibility (32% compared to 0%) and increasing capacity (61% compared to 7%). It is noted however that one or more cells had an expected count less than 5 and thus the data supports no definitive conclusions in this regard.

6.7.13 How businesses innovate

Hypothesis 8: Incubated firms are more likely to lever public support or collaborate in the development of innovatory products and processes than non-incubated firms.

It was postulated that incubated firms would be more likely to lever public support or collaborate in the development of innovatory products and processes, than non-incubated firms as a factor of the incubator environment/culture they inhabit. This was investigated with respondents who indicated that had introduced product and/or process innovations. They were invited to specify whether they had, for example, collaborated with customers, suppliers, business support agency staff or, levered grants to support the development of innovative products, processes, etc. Their responses are presented below. As may be observed from the data below, a visual inspection of the data is not particularly instructive.

Table 6.21: Collaborative R&D (Product Innovation)

N=No. of Cases	No		Yes		
In house	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	48	61	31	39	79
Non-incubated Respondents	77	62	48	38	125
Pearson Chi-Square	**0.14(b)**				
Asymp. Sig. (2-sided)	**.904**				
Continuity Correction (a)	**.000**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 30.59					

N=No. of Cases	No		Yes		Total N
Developed by other businesses/institutions and implemented by respondent	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	71	90	8	10	79
Non-incubated Respondents	110	88	15	12	125
Pearson Chi-Square	**.170(b)**				
Asymp. Sig. (2-sided)	**.680**				
Continuity Correction (a)	**.034**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 8.91					

N=No. of Cases	No		Yes		
Developed in co-operation with other businesses	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	73	92	6	8	79
Non-incubated Respondents	118	94	7	6	125
Pearson Chi-Square	**.323(b)**				
Asymp. Sig. (2-sided)	**.570**				
Continuity Correction (a)	**.075**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 5.03					

N=No. of Cases	No		Yes		
Developed in consultation with suppliers	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	76	96	3	4	79
Non-incubated Respondents	120	96	5	4	125
Pearson Chi-Square	**.005(b)**				
Asymp. Sig. (2-sided)	**.942**				
Continuity Correction (a)	**.000**				
a Computed only for 2x2 table b 2 cells (50.0%) have expected count less than 5. The minimum expected counted is 3.10					

N=No. of Cases	No		Yes		
Developed in consultation with customers	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	70	89	9	11	79
Non-incubated Respondents	120	96	5	4	125
Pearson Chi-Square	**4.139(b)**				
Asymp. Sig. (2-sided)	**.042**				

Continuity Correction (a)	**3.063**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 5.42					
N=No. of Cases	**No**		**Yes**		
Developed in co-operation with other institutions	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	76	96	3	4	79
Non-incubated Respondents	125	100	0	0	125
Pearson Chi-Square	**4.818(b)**				
Asymp. Sig. (2-sided)	**.028**				
Continuity Correction (a)	**2.553**				
a Computed only for 2x2 table b 2 cells (50.0%) have expected count less than 5. The minimum expected counted is 1.16					
N=No. of Cases	**No**		**Yes**		
Developed with the assistance of business support agency staff	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	73	92	6	8	79
Non-incubated Respondents	124	99	1	1	125
Pearson Chi-Square	**6.745(b)**				
Asymp. Sig. (2-sided)	**.009**				
Continuity Correction (a)	**4.850**				
a Computed only for 2x2 table b 2 cells (50.0%) have expected count less than 5. The minimum expected counted is 2.71					
N=No. of Cases	**No**		**Yes**		
Developed with financial assistance/grants	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	73	94	5	6	78
Non-incubated Respondents	121	100	0	0	121
Pearson Chi-Square	**7.956(b)**				
Asymp. Sig. (2-sided)	**.005**				
Continuity Correction (a)	**5.554**				
a Computed only for 2x2 table b 2 cells (50.0%) have expected count less than 5. The minimum expected counted is 1.96					

Using SPSS to conduct bivariate analyses, the Chi-Square was calculated for the two types of respondent and a significant relationship observed between type of respondent reporting innovations 'Developed in consultation with customers', 'Developed in co-operation with other institutions', 'Developed with

the assistance of business support agency staff' and 'Developed with financial assistance/grants'. 11% of business incubator respondents reported that they had collaborated with customers, 4% had collaborated with other institutions, 8% had received assistance from business support agency staff and 6% had benefited from financial assistance compared with 4%, 0%, 1% and 0% of non-incubated respondents respectively. It is noted that in each of the four cases, namely 'Product innovation developed in consultation with suppliers', 'Product innovation developed in co-operation with other institutions', 'Product innovation developed with the assistance of business support agency staff' and 'Product innovation developed with financial assistance/grants' two cells (50%) had an expected count less than 5 and thus due caution must be exercised in the interpretation of these results.

Respondents reporting process innovation were similary invited to explain further, how process innovation is developed in their business. Again, upon a visual inspection of the data, incubated firms appeared to be exhibiting the 'collaborative' behaviours as had been expected of them, more so than non-incubated firms.

Table 6.22: Collaborative R&D (Process Innovation)

N=No. of Cases	No		Yes		
In house	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	25	61	16	39	41
Non-incubated Respondents	23	59	16	41	39
Pearson Chi-Square	**.033(b)**				
Asymp. Sig. (2-sided)	**.885**				
Continuity Correction (a)	**.000**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 15.60					
N=No. of Cases	**No**		**Yes**		
Developed by other businesses/institutions and implemented by respondent	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	21	78	6	22	27
Non-incubated Respondents	30	96	1	4	31
Pearson Chi-Square	**4.907(b)**				

Asymp. Sig. (2-sided)	**.027**				
Continuity Correction (a)	**3.280**				
a Computed only for 2x2 table b 2 cells (50.0%) have expected count less than 5. The minimum expected counted is 3.26					
N=No. of Cases	**No**		**Yes**		
Developed in co-operation with other businesses	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	23	85	4	15	27
Non-incubated Respondents	29	93	2	7	31
Pearson Chi-Square	**1.088(b)**				
Asymp. Sig. (2-sided)	**.297**				
Continuity Correction (a)	**.373**				
a Computed only for 2x2 table b 2 cells (50.0%) have expected count less than 5. The minimum expected counted is 2.79					
N=No. of Cases	**No**		**Yes**		
Developed in consultation with suppliers	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	24	89	3	11	27
Non-incubated Respondents	30	97	1	3	31
Pearson Chi-Square	**1.397(b)**				
Asymp. Sig. (2-sided)	**.237**				
Continuity Correction (a)	**.439**				
a Computed only for 2x2 table b 2 cells (50.0%) have expected count less than 5. The minimum expected counted is 1.86					
N=No. of Cases	**No**		**Yes**		
Developed in consultation with customers	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	24	89	3	11	27
Non-incubated Respondents	29	94	2	6	31
Pearson Chi-Square	**.398(b)**				
Asymp. Sig. (2-sided)	**.528**				
Continuity Correction (a)	**.026**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 2.33					
N=No. of Cases	**No**		**Yes**		
Developed in co-operation with other institutions	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	26	96	1	4	27
Non-incubated Respondents	30	100	0	0	30

Pearson Chi-Square	**1.131(b)**				
Asymp. Sig. (2-sided)	**.288**				
Continuity Correction (a)	**.003**				
a Computed only for 2x2 table b 2 cells (50.0%) have expected count less than 5. The minimum expected counted is .47					
N=No. of Cases	**No**		**Yes**		
Developed with the assistance of business support agency staff	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	24	89	3	11	27
Non-incubated Respondents	30	100	0	0	30
Pearson Chi-Square	**3.519(b)**				
Asymp. Sig. (2-sided)	**.061**				
Continuity Correction (a)	**1.643**				
a Computed only for 2x2 table b 2 cells (50.0%) have expected count less than 5. The minimum expected counted is 1.42					
N=No. of Cases	**No**		**Yes**		
Developed with the financial assistance/grants	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	25	93	2	7	27
Non-incubated Respondents	30	100	0	0	30
Pearson Chi-Square	**2.303(b)**				
Asymp. Sig. (2-sided)	**.129**				
Continuity Correction (a)	**.635**				
a Computed only for 2x2 table b 2 cells (50.0%) have expected count less than 5. The minimum expected counted is .95					

However, when the Chi-Square was calculated for each type of respondent (Table 6.22) the only significant relationship identified was as regards respondents reporting innovation 'Developed by other businesses/institutions and implemented by respondent' with 22% of incubator respondents and only 4% of non-incubated respondents reporting this behaviour. However, two cells (50%) had an expected count less than 5 and thus due caution must and has been exercised in the interpretation of these results.

6.7.14 Delineation of management responsibilities

Hypothesis 9: Incubated firms are more likey to adopt flatter management structures.

Management characteristics of incubated and non-incubated firms were also compared. Respondents were invited to explain whether the management team tasked on functional lines i.e. Director of Finance, Sales, HR, R&TD, etc, and whether this was reflected in practice or whether management arrangements were more informal i.e. more of a shared and collective undertaking with interchangeable roles, tasks, specialities.

Table 6.23: Management Characteristics

N=No. of Cases	No		Yes		
Management Tasked On Funtional Lines	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	46	64	26	36	72
Non-incubated Respondents	75	67	37	33	112
Pearson Chi-Square	**.184(b)**				
Asymp. Sig. (2-sided)	**.668**				
Continuity Correction (a)	**.073**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 24.65					
N=No. of Cases	No		Yes		
Informal	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	28	38	46	62	74
Non-incubated Respondents	44	37	74	63	118
Pearson Chi-Square	**.006(b)**				
Asymp. Sig. (2-sided)	**.939**				
Continuity Correction (a)	**.000**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 27.75					

However, when the Chi-Square was calculated for each type of respondent no relationship could be identified between the type of respondent and the responses collected.

6.7.14 Importance of Intellectual Property Rights (Protections)

Hypothesis 10: Incubated firms are more likely to value and protect IPR than non incubated firms.

Respondents were also invited to indicate the importance/relevance of IPR to their business, and specifically IPR protections. As illustrated below, incubated respondents generally accorded a higher value to patent protection, trademarks, copyright and confidentiality agreements than non-incubated businesses. However, somewhat unexpectedly, non-incubated businesses, as illustrated below, accorded a high value to pay and reward strategies as a means of protecting/retaining IPR than incubated firms.

Table 6.24: Importance of Patents & Patent Protection to Respondents

N=No. of Cases	No		Yes		
Very Important	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	56	73	21	27	77
Non-incubated Respondents	107	87	16	13	123
Important	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	72	94	5	6	77
Non-incubated Respondents	110	89	13	11	123
Not Very Important	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	69	90	8	10	77
Non-incubated Respondents	114	93	9	7	123
Not Important	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	34	44	43	56	77
Non-incubated Respondents	38	31	85	69	123
Pearson Chi-Square	**7.910(a)**				
Asymp. Sig. (2-sided)	**.048**				
Continuity Correction (a)	**-**				
a 0 cells (.0%) have expected count less than 5. The minimum expected counted is 6.55					

Table 6.25: Importance of Trademarks & Trademark Protection to Respondents

N=No. of Cases	No		Yes		
Very Important	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	56	73	21	27	77
Non-incubated Respondents	108	88	15	12	123
Important	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	73	95	4	5	77
Non-incubated Respondents	107	87	16	13	123
Not Very Important	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	69	90	8	10	77
Non-incubated Respondents	110	89	13	11	123
Not Important	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	33	43	44	57	77
Non-incubated Respondents	44	36	79	64	123
Pearson Chi-Square	**9.260(a)**				
Asymp. Sig. (2-sided)	**.026**				
Continuity Correction (a)	**-**				
a 0 cells (.0%) have expected count less than 5. The minimum expected counted is 7.70					

Table 6.26: Importance of Copyright & Copyright Protection to Respondents

N=No. of Cases	No		Yes		
Very Important	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	47	58	31	42	78
Non-incubated Respondents	107	87	16	13	123
Important	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	71	91	7	9	78
Non-incubated Respondents	106	86	17	14	123
Not Very Important	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	71	92	7	8	78
Non-incubated Respondents	112	91	11	9	123
Not Important	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	45	58	33	42	78
Non-incubated Respondents	44	36	79	64	123
Pearson Chi-Square	**19.646(a)**				
Asymp. Sig. (2-sided)	**.000**				
Continuity Correction (a)	**-**				
a 0 cells (.0%) have expected count less than 5. The minimum expected counted is 6.99					

Table 6.27: Importance of Confidentiality & Protecting Confidentiality to Respondents

N=No. of Cases	No		Yes		
Very Important	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	36	46	42	54	78
Non-incubated Respondents	61	49	62	51	123
Important	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	61	78	17	22	78
Non-incubated Respondents	95	77	28	23	123
Not Very Important	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	76	97	2	3	78
Non-incubated Respondents	113	92	10	8	123
Not Important	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	61	78	17	22	78
Non-incubated Respondents	100	81	23	19	123
Pearson Chi-Square	**2.836(a)**				
Asymp. Sig. (2-sided)	**.418**				
Continuity Correction (a)	**-**				
a 1 cells (12.5%) have expected count less than 5. The minimum expected counted is 4.66					

Table 6.28: Importance of Pay & Reward Strategy to Respondents as a Means of Protectign IPR/Know-How

N=No. of Cases	No		Yes		
Very Important	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	53	68	25	32	78
Non-incubated Respondents	76	62	47	38	123
Important	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	62	79	16	21	78
Non-incubated Respondents	94	76	29	24	123
Not Very Important	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	58	74	20	26	78
Non-incubated Respondents	101	82	22	18	123
Not Important	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	61	78	17	22	78
Non-incubated Respondents	98	80	25	20	123
Pearson Chi-Square	**2.129(a)**				
Asymp. Sig. (2-sided)	**.546**				
Continuity Correction (a)	**-**				

a 0 cells (.0%) have expected count less than 5. The minimum expected counted is 16.30

The Chi-Square was calculated for both types of respondent as regards the importance of IPR protection to their business. Significant relationships were observed as between the type of respondent and respondents according importance to 'Patents & Patent Protection', 'Trademarks & Trademark Protection' and 'Copyright & Copyright Protection' though not 'Confidentiality Agreements'or 'Pay and reward strategies' as a means of protecting IPR.

It had been assumed that incubated respondents would exhibit these arguably more 'sophisticated' or 'advanced' behaviours by virtue of the environment they inhabit and the values and behaviours said to be promoted therein. Incubated respondents were proportionately more likely to accord a higher importance of protecting Patents, Trademarks, Copyright but only marginally so as regards the importance they attached to protecting Confidentiality. It is noted, however, that in respect of confidentiality agreements one of the cells had an expected count less than 5 and thus it is not appropriate to draw any definitive conclusion from this specific result.

6.7.16 Application of ICT

Hypothesis 11: Incubated firms are more likely to employ ICT in their business, particularly advanced ICT applications.

In order to compare and contrast the application of technology in north east businesses, and investigate whether incubated firms were more likely to apply ICT and particularly advanced ICT applications in their businesses than non-incubated businesses, respondents were invited to indicate whether they employed, for example, a website, an intranet and/or extranet, utilized CAD, CAM, CAE software applications and other advanced ICT applications. The results are presented below (Table 6.29):

Table 6.29: Application of ICT

N=No. of Cases	No		Yes		
Website providing basic info (i.e. brochure-ware)	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	16	21	60	79	76
Non-incubated Respondents	12	12	89	88	101
Pearson Chi-Square	**2.739(b)**				
Asymp. Sig. (2-sided)	**.098**				
Continuity Correction (a)	**2.094**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 12.02					

N=No. of Cases	No		Yes		
Website enabling customers to place orders/make payment	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	57	76	18	24	75
Non-incubated Respondents	69	83	14	17	83
Pearson Chi-Square	**1.241(b)**				
Asymp. Sig. (2-sided)	**.265**				
Continuity Correction (a)	**.839**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 15.19					

N=No. of Cases	No		Yes		
Website supporting business to business	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	61	81	14	19	75
Non-incubated Respondents	74	91	7	9	81
Pearson Chi-Square	**3.359(b)**				
Asymp. Sig. (2-sided)	**.067**				
Continuity Correction (a)	**2.554**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 10.10					

N=No. of Cases	No		Yes		
Intranet	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	51	67	25	33	76
Non-incubated Respondents	77	92	7	8	84
Pearson Chi-Square	**15.044(b)**				
Asymp. Sig. (2-sided)	**.000**				
Continuity Correction (a)	**13.548**				
a Computed only for 2x2 table					

b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 15.20					
N=No. of Cases	**No**		**Yes**		
Extranet	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	68	91	7	9	75
Non-incubated Respondents	78	96	3	4	81
Pearson Chi-Square	**2.057(b)**				
Asymp. Sig. (2-sided)	**.151**				
Continuity Correction (a)	**1.226**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is					

N=No. of Cases	**No**		**Yes**		
Computer Assisted Design	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	49	64	27	36	76
Non-incubated Respondents	66	80	16	20	82
Pearson Chi-Square	**5.107(b)**				
Asymp. Sig. (2-sided)	**.024**				
Continuity Correction (a)	**4.330**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 20.68					

N=No. of Cases	**No**		**Yes**		
Computer Assisted Manufacturing	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	67	89	8	11	75
Non-incubated Respondents	76	94	5	6	81
Pearson Chi-Square	**1.029(b)**				
Asymp. Sig. (2-sided)	**.310**				
Continuity Correction (a)	**.525**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 6.25					

N=No. of Cases	**No**		**Yes**		
Computer Assisted Engineering	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	65	87	10	13	75
Non-incubated Respondents	76	94	5	6	81
Pearson Chi-Square	**2.297(b)**				
Asymp. Sig. (2-sided)	**.130**				
Continuity Correction (a)	**1.547**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 7.21					

N=No. of Cases	No		Yes		
Other Advanced ICT Applications	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	32	42	44	58	76
Non-incubated Respondents	70	82	15	18	85
Pearson Chi-Square	**27.995(b)**				
Asymp. Sig. (2-sided)	**.000**				
Continuity Correction (a)	**26.289**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 27.85					

As may be observed from the results above (Table 6.29), notwithstanding the fact that a greater proportion of non-incubated firms reported that they had established a website featuring basic information i.e. brochure-ware than incubated business, a greater proportion of incubated businesses that had established an on-line presence reported that it also featured additional and more advanced utilities supporting more advanced functions e.g. supporting orders and sales (ordering and payment) and/or tele-working, and/or an extranet, etc was higher than non-incubated businesses.

The Chi-Square was again calculated using SPSS for the two types of respondent, however, only significant relationships were found as between respondents reporting that they operated an 'Intranet', 'Computer Assisted Design' and 'Other Advanced ICT Applications'. 33% of incubator respondents reported that they operated an 'Intranet' compared to 8% of non-incubated respondents. 36% of incubator respondents reported that they utilised 'Computer Assisted Design compared to 20% of non-incubated respondents. 58% of incubator respondents reported that they operated 'Other Advanced ICT Applications' compared to 18% of non-incubated respondents.

16.7.17Quality Accreditation

Hypothesis 12: Incubated firms are more likely to be quality conscious and have secured quality accreditation than non-incubated firms.

Arrangements for and a commitment to quality (and accreditation thereof) was also selected as a 'model' behaviour for investigation as between incubated and non-incubated businesses. The Chi-Square was calculated using SPSS for the two types of respondent. As illustrated below, significant relationships were found as regards respondents reporting that they held 'ISO 9000' accreditation, 'Environmental standard(s)' and 'Accreditation with private sector businesses as a preferred supplier'.

Table 6.30: Quality Accreditation

N=No. of Cases	No		Yes		
ISO 9000	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	41	62	25	38	66
Non-incubated Respondents	21	28	53	72	74
Pearson Chi-Square	**16.098(b)**				
Asymp. Sig. (2-sided)	**.000**				
Continuity Correction (a)	**14.760**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 29.23					
N=No. of Cases	**No**		**Yes**		
Investors in People	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	46	79	12	21	58
Non-incubated Respondents	49	72	19	28	68
Pearson Chi-Square	**.887(b)**				
Asymp. Sig. (2-sided)	**.346**				
Continuity Correction (a)	**.539**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 14.27					
N=No. of Cases	**No**		**Yes**		
Environmental Standard(s)	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	41	72	16	28	57
Non-incubated Respondents	59	88	8	12	67
Pearson Chi-Square	**5.134(b)**				
Asymp. Sig. (2-sided)	**.023**				
Continuity Correction (a)	**4.152**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 11.03					

N=No. of Cases	No		Yes		
Accreditation with public agencies as an accredited or preferred supplier	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	46	82	10	18	56
Non-incubated Respondents	49	72	19	28	68
Pearson Chi-Square	**1.743(b)**				
Asymp. Sig. (2-sided)	**.187**				
Continuity Correction (a)	**1.226**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 13.10					

N=No. of Cases	No		Yes		
Accreditation with private sector businesses as a preferred supplier	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	34	60	23	40	57
Non-incubated Respondents	57	84	11	16	68
Pearson Chi-Square	**9.151(b)**				
Asymp. Sig. (2-sided)	**.002**				
Continuity Correction (a)	**7.971**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 15.50					

N=No. of Cases	No		Yes		
Other	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	51	86	8	14	59
Non-incubated Respondents	62	94	4	6	66
Pearson Chi-Square	**2.018(b)**				
Asymp. Sig. (2-sided)	**.155**				
Continuity Correction (a)	**1.247**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 5.66					

As is evident from the data above, incubated firms generally demonstrate a higher commitment to achieving accreditation with private sector businesses as an accredited or preferred supplier than non-incubated respondents(40% compared to 16%) and environmental standards (28% compared to 12%). However, a greater proportion of non-incubated firms (72%) reported ISO 9000 accreditation compared to incubator respondents (38%).

6.7.18 Engagement with public sector business support infrastructure

Hypothesis 13: Incubated firms are more likely to engage with and avail themselves of public support for business and technology development.

It was postulated that incubated firms should/would be more likely to be aware of and able to lever public-sector business support (given that they are physically located within the public sector business support infrastructure) including Technology Acquisition Schemes (Teaching Company Schemes (TCS), Knowledge Transfer Partnerships (KTPs), Technology Demonstration Projects, etc). The results are presented below.

Table 6.31: Respondents reporting that they have benefited from public sector business support programmes

N=No. of Cases	No		Yes		
Technology Development Programmes	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	54	90	6	10	60
Non-incubated Respondents	37	70	16	30	53
Pearson Chi-Square	**7.316(b)**				
Asymp. Sig. (2-sided)	**.007**				
Continuity Correction (a)	**6.085**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 10.32					
N=No. of Cases	**No**		**Yes**		
Technology Acquisition Schemes	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	39	89	5	11	44
Non-incubated Respondents	45	100	0	0	45
Pearson Chi-Square	**5.418(b)**				
Asymp. Sig. (2-sided)	**.020**				
Continuity Correction (a)	**3.487**				
a Computed only for 2x2 table b 2 cells (50.0%) have expected count less than 5. The minimum expected counted is 2.47					

N=No. of Cases	No		Yes		
Management Information Programmes	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	33	75	11	25	44
Non-incubated Respondents	17	36	30	64	47
Pearson Chi-Square	**13.841(b)**				
Asymp. Sig. (2-sided)	**.000**				
Continuity Correction (a)	**12.317**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 19.82					

N=No. of Cases	No		Yes		
European Programmes	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	39	89	5	11	44
Non-incubated Respondents	44	98	1	2	45
Pearson Chi-Square	**2.957(b)**				
Asymp. Sig. (2-sided)	**.086**				
Continuity Correction (a)	**1.682**				
a Computed only for 2x2 table b 2 cells (50.0%) have expected count less than 5. The minimum expected counted is 2.97					

N=No. of Cases	No		Yes		
Other public-innovation related support	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	33	75	11	25	44
Non-incubated Respondents	42	94	3	6	45
Pearson Chi-Square	**5.641(b)**				
Asymp. Sig. (2-sided)	**.018**				
Continuity Correction (a)	**4.343**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 6.92					

Evidently, as may be observed from the data collected and presented above, a higher proportion of non-incubated firms had availed themselves of Technology Development Programmes (30% compared to 10%) and Management Information Programmes (64% compared to 25%) while a greater proportion of incubator respondents had received support from Technology Acquisition Schemes (11% compared to 0%), European Programmes (11% compared to 2%) and Other public-innovation related support (25% compared to 6%). Given the plethora of

business support agencies in the region and the multitude of services and programmes the low-level of take-up of support was generally surprising. This is consistent with Bannock's observation (2005) that not only is there almost universal availability of SME support systems and instruments, the low level of take-up of such policies is almost universally low. He concludes that 'there is no reason to suppose that if most subsidy and assistance programmes were abolished altogether, it would make a significant difference to the shape and prosperity of the SME sector anywhere (Bannock, 2005, p.133).

The data was subsequently analysed using SPSS and the Chi-Square calculated for both types of respondent. As may be noted from the results presented above (Table 6.31), a significant relationship was noted between respondents reporting that they had benefited from 'Technology Development Programmes', 'Technology Acquisition Schemes', 'Management Information Programmes' and 'Other public-innovation related support'. It is noted however, in respect of both Technology Acquisition Schemes and European Programmes two cells (50.0%) have expected count less than 5 and thus these specific results do not support definitive conclusions.

6.7.19 Businesses reporting Growth as measured by increase in turnover

Hypothesis 14: Incubated firms are more likely to have experienced growth than non-incubated firms as measured by increases in turnover.

A key variable selected to test as to whether incubators have positively impacted tenant firms, was growth. The data collected, contrary to expectation, did not suggest that incubated firms were more likely to report growth as measured by an increase in turnover. SPSS was again used to calculate the Chi-Square, however no relationship was found.

Table 6.32: Businesses reporting Growth as measured by increase in turnover

N=No. of Cases	No		Yes		
Reporting Increase In Turnover	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	17	36	30	64	47
Non-incubated Respondents	50	46	58	54	108
N=No. of Cases	No		Yes		
Reporting Decrease In Turnover	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	42	89	5	11	47
Non-incubated Respondents	92	85	16	15	108
N=No. of Cases	No		Yes		
Reporting No Change In Turnover	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	35	74	12	26	47
Non-incubated Respondents	74	69	34	31	108
Pearson Chi-Square	**1.404(a)**				
Asymp. Sig. (2-sided)	**.496**				
Continuity Correction	**-**				
a 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.37.					

Interestingly, when invited to indicate whether their turnover had increased, decreased or remained the same both incubator respondents (N=47) and non-incubated respondents (N=108) generally reported that their turnover was up on the figure of two years ago.

Of the Incubator Respondents who reported and quantified an increase in their turnover (N=26) the average increase was 45% (Mean) and 20% (Median) compared to Non-incubated Respondents (N=29) reporting increases of 13.50% (Mean) and 10% (Median).

Of the Incubator Respondents who reported and quantified a reduction in their turnover (N=2) the average reduction was 2.00% (Mean) and 2.00% (Median) compared to Non-incubated Respondents (N=3) of 5.17% (Mean) and 5.00% (Median)

6.7.20 Businesses reporting Growth as measured by increase in employment

Hypothesis 15: Incubated firms are more likely to have experienced growth than non-incubated firms as measured by increases in employment.

Similarly, it was assumed that incubated firms were more likely to report growth as measured by an increase in employment. Using SPSS to calculated the Chi-Square no significant relationship was found.

Table 6.33: Businesses reporting Growth as measured by increase in employment

N=No. of Cases	No		Yes		
Reporting Increase In Employment	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	46	61	30	39	76
Non-incubated Respondents	78	63	46	37	124
N=No. of Cases	No		Yes		
Reporting Decrease In Employment	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	62	82	14	18	76
Non-incubated Respondents	107	86	17	14	124
N=No. of Cases	No		Yes		
Reporting No Change In Employment	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	44	58	32	42	76
Non-incubated Respondents	63	51	61	49	124
Pearson Chi-Square	**1.254(a)**				
Asymp. Sig. (2-sided)	**.534**				
Continuity Correction	**-**				
a 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.78.					

Interestingly, when invited to indicate whether the number of full-time staff employed by the respondent has increased, decreased or remained the same both incubator respondents (N=76) and non-incubated respondents (N=124) generally reported that their staffing levels were down on the figure of two years ago.

Of the Incubator Respondents who reported and quantified an increase in the number of full-time staff (N=34) they employed the average increase was 60.89% (Mean) and 36.67% (Median) compared to Non-incubated Respondents (N=30) reporting increases of 15.50% (Mean) and 10% (Median) increase.

Of the Incubator Respondents who reported and quantified a reduction in the number of full-time staff (N=5) the average reduction was 18.40% (Mean) and 20.00% (Median) compared to Non-incubated Respondents (N=5) of 6.4% (Mean) and 1.00% (Median)

6.8 Innovation and the Conduct of business in sampled firms

Upon a visual inspection of the data, a greater proportion of incubated firms reported higher levels of novelty vis-a-vis product, process and aministrative innovations; a higher propensity to innovate and were proportionately more likely to report expenditure on research and development. Using SPSS to calculate the Chi-Square in order to test for statistically significant relationships between respondent types and variables associated with 'innovative' or 'enterprising' behaviours, significant relationships were observed as regards respondents reporting:

- product innovations 'New to their market' and 'New to their industry';
- process innovations 'New to their market' and 'New to their industry'; and
- administrative innovations 'New to their market' and 'New to their industry'.

It is noted however that in respect of those respondents reporting process innovations 'new to their industry' one of the cells had an expected count less than 5 and thus proper caution should be exercised in the interpretation of this result.

A significant relationship was also found as between respondents reporting 'New & Original Breakthrough(s)' and 'Adoptions'; respondents reporting a propensity to innovate new products and processes but not as regards a propensity to innovate administrative innovations. Therein, incubated respondents were

proportionately more likely to report these 'innovative' or 'enterprising' behaviours than non-incubated firms.

As noted above, significant relationships were also found between respondents reporting BERD, specifically 'In-House', 'Acquisition of External R&D', 'Acquisition of Machinery & Equipment', 'Acquisition of External Knowledge', 'Training' and 'Internal/External Marketing'. Incubated respondents were again proportionately more likely to report these 'innovative' or 'enterprising' behaviours than non-incubated firms.

Significant relationships were also identified between respondents according importance to product innovation and its role in 'Extending product range', 'Opening new markets and/or increasing market share' and 'Improving quality'. Incubated respondents were again proportionately more likely to report these 'innovative' or 'enterprising' behaviours than non-incubated firms and this was particularly notable as regards the importance the incubated respondents attached to the importance of process innovation in their businesses compared to non-incubated respondents. However, while significant relationships were found vis-a-vis the contribution of process innovation to 'Reduced materials/energy costs', 'Improved flexibility', 'Reduced labour costs', and 'Increased capacity' it was noted that one or more cells had an expected count less than 5 and thus it must therefore be acknowledged that the size of the sample supports no definitive conclusion as regards the importance attached to process innovation by the respondents.

There was little to indicate, from a visual inspection of the data, that incubated respondents worked more collaboratively in the development of product or process innovation than non-incubated respondents. Significant relationships were however observed as between type of respondent reporting product innovations 'Developed in consultation with customers', 'Developed in co-operation with other institutions', 'Developed with the assistance of business support agency staff' and 'Developed with financial assistance/grants'. However with regards to three of these variables, namely product innovation 'Developed in co-operation with other institutions', 'Developed with the assistance of business

support agency staff' and 'Developed with financial assistance/grants', two cells (50%) had an expected count less than 5 and this must therefore be reflected in the analysis.

As regards respondents reporting collaboration in connection with process innovations the only significant relationship identified in was in respect of product innovation 'Developed by other businesses/institutions and implemented by respondents'. In any event, again due to the sample size, two cells (50%) had an expected count less than 5 and thus caution must be exercised in the interpretation of this result.

No relationship could be found as regards innovation and market focus and no relationship could be found between the type of respondent and whether innovation in respondent firms was the outcome of strategies and plans nor could any relationship be identified as regards type of respondent and their management characterstics. There was little to indicate, however, that the occurence of innovation in respondent businesses varied significantly by type i.e. incubated and non-incubated.

Significant relationships were observed as between respondents according importance to 'Patents & Patent Protection', 'Trademarks & Trademark Protection' and 'Copyright & Copyright Protection' but not 'Confidentiality Agreements'or 'Pay and reward strategies' as a means of protecting IPR. Incubated respondents were proportionately more likely to accord a high importance of protecting Patents, Trademarks, Copyright but only marginally so as regards the importance they attached to protecting Confidentiality. It is noted, however, that in respect of confidentiality agreements one of the cells had an expected count less than 5 and thus it is not appropriate to draw any definitive conclusion from this particular result.

As regards other 'innovative' or 'enterprising' behaviours significant relationships detected concerned the application of ICT in respondent businesses were the operation of 'Intranets', 'Computer Assisted Design' and 'Other Advanced ICT Applications'. While proportionately more incubated respondents

reported that they operated an 'Intranet' or 'Other Advanced ICT Applications' than non-incubated respondents, the reverse was true of 'Computer Assisted Design'.

Significant relationships were also found in connection with respondent's commitment to quality, specifically 'ISO 9000' accreditation, 'Environmental standard(s)' and 'Accreditation with private sector businesses as a preferred suppliers'. Proportionately more incubated respondents reported that they held 'Environmental standard(s)' and enjoyed 'Accreditation with private sector businesses as a preferred suppliers', however, the reverse was true as regards 'ISO 9000' accreditation.

Finally, with reference to the degree and extent to which respondents had availed themselves of public-sector business support and assistance, a significant relationship was noted between respondents reporting that they had benefited from 'Technology Development Programmes', 'Technology Acquisition Schemes', 'Management Information Programmes' and 'Other public-innovation related support'. While proportionately fewer incubator respondents than non-incubated respondents reported that they had benefited from 'Technology Development Programmes' and 'Management Information Programmes', a higher proportion reported that they had benefited from 'Technology Acquisition Schemes' and 'Other public-innovation related support'.

In an effort to explain whether this difference in behaviour can be attributed to the impact incubators have had on the operation of incubated businesses or is otherwise a factor of a selection bias (NEBIC, for example, selects businesses or rather individuals who are inherently more likely be innovative and more likely to be growth orientated), respondents were also invited to report previous experience (one of the factors in the selection of tenants admitted to the BIC as identified in Chapter 5) and their level of educational qualifications (a factor frequently cited in the literature as being associated with high growth, innovative firms - see, for example, Fothergill and Gudgin (1982, p.3) who assert that SMEs created by university qualified individuals tend to grow quicker than those created by individuals with less formal educations).

6.9 Founder Characteristics of sampled firms

Previous joint work experience amongst business founders was found to be notably higher amongst the incubated firms than non-incubated firms. Conversely, founders of non-incubated businesses were apparently more likely to have known each other socially but have no previous history of working together.

Table 6.34: Founder joint work experience

N=No. of Cases	No		Yes		
Worked together in same firm	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	32	74	11	26	43
Non-incubated Respondents	44	77	13	23	57
Pearson Chi-Square	**.103(b)**				
Asymp. Sig. (2-sided)	**.748**				
Continuity Correction (a)	**.007**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 10.32					

N=No. of Cases	No		Yes		
Worked together but in different firms	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	28	72	11	28	39
Non-incubated Respondents	42	79	11	21	53
Pearson Chi-Square	**.685(b)**				
Asymp. Sig. (2-sided)	**.408**				
Continuity Correction (a)	**.337**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 9.33					

N=No. of Cases	No		Yes		
Knew each other socially but never worked together	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	36	90	4	10	40
Non-incubated Respondents	31	57	23	43	54
Pearson Chi-Square	**11.923(b)**				
Asymp. Sig. (2-sided)	**.001**				
Continuity Correction (a)	**10.384**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 11.49					

The Chi-Square was calculated for the two types of respondent revealed a significant relationship as regards respondents reporting that they 'Knew each other socially but never worked together'. It is striking that proportionately more non-incubated respondents (43%) than incubator respondents (10%) reported the founders of the business had known each other socially but never worked together.

A higher proportion incubated business founders indicated that they were much more likely to have previous management, R&D, and sales and marketing experience at start-up than the non-incubated business founders (Table 6.35).

Table 6.35: Founder Previous Work Experience (i)

N=No. of Cases	No		Yes		
Previous Management Experience	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	10	22	36	78	46
Non-incubated Respondents	37	44	48	56	85
Pearson Chi-Square	**6.160(b)**				
Asymp. Sig. (2-sided)	**.013**				
Continuity Correction (a)	**5.249**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 16.50					
N=No. of Cases	No		Yes		
Previous Experience in R&D	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	33	70	14	30	47
Non-incubated Respondents	72	92	6	8	78
Pearson Chi-Square	**10.653(b)**				
Asymp. Sig. (2-sided)	**.001**				
Continuity Correction (a)	**9.072**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 7.52					

N=No. of Cases	No		Yes		
Previous experience in Sales & Marketing	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	17	37	29	63	46
Non-incubated Respondents	54	68	26	32	80
Pearson Chi-Square	**11.077(b)**				
Asymp. Sig. (2-sided)	**.001**				
Continuity Correction (a)	**9.870**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 20.08					

On calculating the Chi-Square for the two types of respondent a significant relationship was noted as regards respondents reporting 'Previous Management Experience', 'Previous Experience in R&D ' and 'Previous experience in Sales & Marketing' with proportionately more incubator respondents than non-incubated respondents reporting these founder characteristics (78% compared to 56%, 30% compared to 8% and 63% compared to 32%, respectively).

As may be observed from the data presented in Table 6.36 (below), a significantly higher proportion of incubated business founders indicated that they had previous experience in 'Consultancy' (52% compared to 9%) and 'Higher Education' (61% compared to 17%) than non-incubated business founders.

Table 6.36: Founder Previous Work Experience (ii)

N=No. of Cases	No		Yes		
Previous experience in Consultancy	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	22	48	24	52	46
Non-incubated Respondents	71	91	7	9	78
Pearson Chi-Square	**28.800(b)**				
Asymp. Sig. (2-sided)	**.000**				
Continuity Correction (a)	**26.542**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 11.50					

N=No. of Cases	No		Yes		
Previous experience in Higher Education	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	18	39	28	61	46
Non-incubated Respondents	66	83	14	17	80
Pearson Chi-Square	**24.721(b)**				
Asymp. Sig. (2-sided)	**.000**				
Continuity Correction (a)	**22.808**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 15.33					

In calculating the Chi-Square for the two types of respondent, significant relationships were noted as regards 'Previous experience in Consultancy' and 'Previous experience in Higher Education' (see Table 6.36) and 'Previous experience in a large firm' (see Table 6.37).

A significantly higher proportion of incubator respondents (72%) than non-incubated respondents (38%) reported that the business founder has previous experience in a large firm and the Chi-Square reveals that there is a significant relationship vis-a-vis respondents reporting this characterstic. No significant relationship was identified as regards respondents reporting founder experience in small firms.

Table 6.37: Founder Previous Work Experience (iii)

N=No. of Cases	No		Yes		
Previous experience in a large firm	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	13	28	33	72	46
Non-incubated Respondents	51	62	31	38	82
Pearson Chi-Square	**13.574(b)**				
Asymp. Sig. (2-sided)	**.000**				
Continuity Correction (a)	**12.250**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 23.00					

N=No. of Cases	No		Yes		
Previous experience in a small firm	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	25	54	21	46	46
Non-incubated Respondents	50	60	33	40	83
Pearson Chi-Square	**.422(b)**				
Asymp. Sig. (2-sided)	**.516**				
Continuity Correction (a)	**.215**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 19.26					

As regards, founder's previous experience of new venture creation (Table 6.38 below), the Chi-Square revealed a significant relationship as regards respondents reporting 'previous experience in new venture creation', however, no significant relationship was found as regards respondents who reported that their founder had 'previous experience of setting up a firm within the same sector'.

Table 6.38: Founder Previous Work Experience (iv)

N=No. of Cases	No		Yes		
Previous experience in new venture creation	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	31	67	15	33	46
Non-incubated Respondents	71	92	6	8	77
Pearson Chi-Square	**12.526(b)**				
Asymp. Sig. (2-sided)	**.000**				
Continuity Correction (a)	**10.835**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 7.85					

N=No. of Cases	No		Yes		
Previous experience of setting up a firm within the same sector	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	35	78	10	22	45
Non-incubated Respondents	58	70	25	30	83
Pearson Chi-Square	**.916(b)**				
Asymp. Sig. (2-sided)	**.338**				
Continuity Correction (a)	**.563**				

a Computed only for 2x2 table

b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 12.30

A significantly higher proportion of incubated firms reported previous experience than non-incubated firms (33% compared to 8%).

As is evident from the data below (Table 6.39), a significantly higher proportion of incubated respondent (founders) (33%) also reported previous experience as self-employed (compared to 15% of non-incubated respondents), however, 23% of non-incubated respondents reported that their founder's had previous experience in family businesses compared to 27% of incubator respondents.

Table 6.39: Founder Previous Work Experience (v)

N=No. of Cases	No		Yes		
Previous experience as self-employed	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	31	67	15	33	46
Non-incubated Respondents	67	85	12	15	79
Pearson Chi-Square	**5.209(b)**				
Asymp. Sig. (2-sided)	**.022**				
Continuity Correction (a)	**4.231**				

a Computed only for 2x2 table

b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 9.94

N=No. of Cases	No		Yes		
Previous experience in a family business	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	33	73	12	27	45
Non-incubated Respondents	62	77	19	23	81
Pearson Chi-Square	**.161(b)**				
Asymp. Sig. (2-sided)	**.689**				
Continuity Correction (a)	**.034**				

a Computed only for 2x2 table

b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 11.07

As may be observed from the Table above, the Chi-Square was calculated and a significant relationship was found as regards founders with 'Previous

experience as self-employed' but not as regards 'Previous experience in a family business'. As stated above, the educational level (academic) of the founders was also investigated in an effort to determine whether this might account for differences in behaviour between incubated and non-incubated businesses.

Table 6.40: Founder's Level of Educational Attainment

N=No. of Cases	No		Yes		
Postgraduate (PhD)	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	46	100	0	0	46
Non-incubated Respondents	52	88	7	12	59
Pearson Chi-Square	**5.847(b)**				
Asymp. Sig. (2-sided)	**.016**				
Continuity Correction (a)	**4.096**				
a Computed only for 2x2 table b 2 cells (50.0%) have expected count less than 5. The minimum expected counted is 3.07					
N=No. of Cases	**No**		**Yes**		
MBA	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	40	89	5	11	45
Non-incubated Respondents	52	95	3	5	55
Pearson Chi-Square	**1.076(b)**				
Asymp. Sig. (2-sided)	**.300**				
Continuity Correction (a)	**.445**				
a Computed only for 2x2 table b 2 cells (50.0%) have expected count less than 5. The minimum expected counted is 3.60					
N=No. of Cases	**No**		**Yes**		
MSc	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	41	91	4	9	45
Non-incubated Respondents	52	93	4	7	56
Pearson Chi-Square	**.104(b)**				
Asymp. Sig. (2-sided)	**.747**				
Continuity Correction (a)	**.000**				
a Computed only for 2x2 table b 2 cells (50.0%) have expected count less than 5. The minimum expected counted is 3.56					
N=No. of Cases	**No**		**Yes**		
MA	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	43	96	2	4	45
Non-incubated Respondents	53	96	2	4	55
Pearson Chi-Square	**.042(b)**				

Asymp. Sig. (2-sided)	**.837**				
Continuity Correction (a)	**.000**				
a Computed only for 2x2 table b 2 cells (.0%) have expected count less than 5. The minimum expected counted is 1.80					
N=No. of Cases	**No**		**Yes**		
Undergraduate degree	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	39	87	6	13	45
Non-incubated Respondents	45	76	14	24	59
Pearson Chi-Square	**1.776(b)**				
Asymp. Sig. (2-sided)	**.183**				
Continuity Correction (a)	**1.170**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 8.65					
N=No. of Cases	**No**		**Yes**		
A level	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	26	58	19	42	45
Non-incubated Respondents	43	74	15	26	58
Pearson Chi-Square	**3.067(b)**				
Asymp. Sig. (2-sided)	**0.80**				
Continuity Correction (a)	**2.372**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 14.85					
N=No. of Cases	**No**		**Yes**		
O level/GCSE	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	30	67	15	33	45
Non-incubated Respondents	33	60	22	40	55
Pearson Chi-Square	**3.028(b)**				
Asymp. Sig. (2-sided)	**.082**				
Continuity Correction (a)	**2.387**				
a Computed only for 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 19.46					

N=No. of Cases	No		Yes		
Vocational Trade Qualifications	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	27	57	20	43	47
Non-incubated Respondents	20	26	56	74	76
Pearson Chi-Square	**11.920(b)**				
Asymp. Sig. (2-sided)	**.001**				
Continuity Correction (a)	**10.638**				
a Computed only for 2x2 table					
b 0 cells (.0%) have expected count less than 5. The minimum expected counted is 17.96					

As may be noted from the data table above (Table 6.40), a higher proportion of non incubated respondents reported that the founder(s) of their business had vocational trade qualifications than incubated firms (74% compared to 43%) and/or were qualified to degree level and or postgraduate level (PhD) than incubated firms (0% compared to 12%). The Chi-Square was calculated for both types of respondent (Table 6.40, above) but the only significant relationships that were found were as between respondents reporting that the founders were educated to 'Postgraduate (PhD)' level and those with 'Vocational Trade Qualifications'. In respect of the former, however, two cells (50%) had an expected count less than 5 and thus does not support a definitive conclusion.

In summary, as illustrated above, prima face a higher proportion of incubated firms reported 'more innovatory' behaviours than their non-incubated counterparts. The difference in behaviours might however be attributed to the individual characteristics of the founders, however, as regards the characterstics explored in this research (see above) these were not found to be particularly telling. Nevertheless, it still might be true that the performance (difference in behaviours) of the incubated firms is no more than a factor of a selection bias, as for example NEBIC endeavours to support innovatory companies or rather businesses with an innovatory idea.

Unable to account for the difference in behaviours with reference to founder's education, experience and other personal characteristics, motive was also examined in the light of NEBIC (intuitive) selection criteria, specifically whether the founder was prompted to establish their business by:

- a perceived a market opportunity, desire for personal challenge, achievement, independence, improved social status, profit, etc; and/or
- unemployment or a previous unsatisfactory professional experience.

The results are presented below:

Table 6.41: Founder Motivation at Start-Up

N=No. of Cases	No		Yes		
Perceived Market Opportunity	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	12	25	36	75	48
Non-incubated Respondents	14	13	97	87	111
Pearson Chi-Square	**3.759(b)**				
Asymp. Sig. (2-sided)	**.053**				
Continuity Correction (a)	**2.908**				
a Computed only for a 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.85.					
N=No. of Cases	No		Yes		
Unsatisfactory professional experience	**N**	**%**	**N**	**%**	**Total N**
Incubator Respondents	33	72	13	28	46
Non-incubated Respondents	84	87	13	13	97
Pearson Chi-Square	**4.631(b)**				
Asymp. Sig. (2-sided)	**.031**				
Continuity Correction (a)	**3.686**				
a Computed only for a 2x2 table b 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.36.					

Interestingly, a higher proportion of incubated founders (28% compared to 13% of non-incubated respondents) reported unsatisfactory professional experience and a significant relationship was noted in connection with this variable but not 'Perceived Market Opportunity' as the founder's motivation at start-up.

6.10 Summary

In summary, while it was expected that that incubator respondents would demonstrate more 'innovative' or 'advanced' behaviours as a consequence of being in the incubator environment (which might equally be attributed to incubator selection bias vis-a-vis the nature of firms they elect to support) evidence was found for the following propositions:

Hypothesis 1: Incubated firms are more innovatory than non-incubated firms (as measured by novelty).

Hypothesis 2: Incubated firms are more innovatory than non-incubated firms (as measured by their propensity to innovate). While the data supports the proposition in respect of incubated firms' higher propensity for product innovation the sample size does not support the same conclusion as regards process innovation.

Hypothesis 3: Incubated firms are more likely to invest/incur business expenditure related to R&D (BERD).

Hypothesis 6: Incubated firms are more likely to accord a value (a higher value) to product/service innovations and, for example, their role in/importance to extending product/service ranges, market share and penetration and quality than non-incubated firms.

Hypothesis 10: Incubated firms are more likely to value and protect IPR than non incubated firms.

Only limited evidence was found for:

Hypothesis 7: Incubated firms are more likely to accord a value (a higher value) to process innovations and, for example, their role in/importance to reducing operating costs (materials, energy and labour), improving flexibility and increasing capacity.

Hypothesis 8: Incubated firms are more likely than non-incubated firms to lever public support or collaborate in the development of innovatory products and processes than non-incubated firms.

Hypothesis 11: Incubated firms are more likely to employ ICT in their business, particularly advanced ICT applications than non-incubated firms.

Hypothesis 12: Incubated firms are more likely to be quality conscious and have secured quality accreditation than non-incubated firms.

Hypothesis 13: Incubated firms are more likely than non-incubated firms to engage with and avail themselves of public support for business and technology development.

No evidence was found for:

Hypothesis 4: R&D/Innovation effort is more likely to be commercial i.e. market led/focused in incubated firms and the than non-incubated firms.

Hypothesis 5: Innovation within incubated firms is more likely to be the outcome of strategies and plans than non-incubated firms.

Hypothesis 9: Incubated firms are more likely to adopt flatter management structures.

Hypothesis 14: Incubated firms are more likely to have experienced growth than non-incubated firms as measured by increases in turnover.

Hypothesis 15: Incubated firms are more likely to have experienced growth than non-incubated firms as measured by increases in employment.

As illustrated in the case studies presented in chapter 4 and as explored in chapter 5, (and not withstanding the difficulty of attribution, i.e. that the aforementioned 'innovative' or 'enterprising' behaviour or characteristics are a direct product of the incubator environment) it is questionable however whether the activity of business incubators can be or should be reduced to simple firm-level metrics. Indeed, incubators (including NEBIC) can point to a range of activities and impacts at both a micro level (vis-à-vis the performance of incubated firms) and at a macro level re programmes and initiatives designed to support the broader business community (see Chapter 4), boost entrepreneurialism (e.g. NEBICs Annual Spirit of Innovation Awards scheme) and provide a range of additional services to the satisfaction of multiple of stakeholders and with diverse interests, which are not so neatly compartmentalised or translated into quantitative or qualitative metrics.

It is in any event inherently difficult to benchmark the results as might be obtained given the complexity of adjusting for different levels of input, regional factor conditions and endowments, incubator objectives, etc, notwithstanding obvious difficulties in establishing attribution and the nature and level of these effects at a macro or indeed micro (firm) level. However, for the reasons set out in chapters 1, 3, 4, and 5 it is anticipated that as a matter of necessity, stakeholders (particularly funding agancies) will become more exacting in their evaluation of incubator performance.

Chapter 7: Conclusions

7.1 Introduction

As required under the terms of this ESRC Case Studentship, this research has investigated the development of business incubation and has examined the policy rationale for the modality, specifically, the role and contribution of SMEs to regional economic dynamics. This investigation has also considered the nature and scope of business incubation operations (which are said to enhance regional economic competitiveness by supporting indigenous businesses) and has sought to understand the degree and extent to which business incubators add value to their regional/local economy using qualitative and quantitative approaches and techniques.

Moreover, this research has sought to establish an evidential foundation for public confidence in the incubator modality by examining 'incubation' as practised by European Business and Innovation Centres, specifically NEBIC (the industrial sponsor of the this Case Studentship), and the degree and extent to which NEBIC impacts the growth and development of the Small and Medium-sized enterprises it assists by comparing the characteristics, performance and the innovative behaviour of the firms it incubates against non-incubated firms.

7.2 Policy Review

In an endeavour to understand the context for the evolution of 'business incubators/incubation' this research has reviewed policy and the nature of policy instruments up until the 1970/80s (wherein we might identify the genesis of incubation, see Chapter 3) which are generally critiqued as being largely reactive and concerned with 'fire-fighting' and/or protecting - as opposed to necessarily advancing - indigenous business i.e. combating international competition or attempting to alleviate the effects of economic restructuring.

It is evident from the academic and policy literature that with economic restructuring proceeding apace throughout the 1980s, the largely academic

convergence-divergence debate that coloured so much of the neoclassical economic literature was increasingly confined to the literature by the collapse of so many industries and industrial giants; this compounded the erosion of neo-classical economic theory and policy approaches rooted therein and fostered the emergence of new approaches, prompted by a new focus upon the potential of enterprise, innovation, and new firm formation to produce endogenous growth (Eisinger, 1988; Massey et al., 1992; Atkinson, 1991)) as policy makers were required to develop new prescriptions and instruments (and quickly) to ameliorate their socio-economic effects.

SMEs - which had hitherto been largely peripheral considerations in industrial geography and policy that accorded the promotion and development of large firms exploiting economies of scale as of primary importance - became increasingly significant as the decline of traditional industries and the emergence of the SMEs prompted a new focus and a concern to develop facilities and services to support their development (particularly, according to Amirahmadi and Saff (1993, p.108), in high value added technologies).

In policy terms, as noted in Chapter 2 and notwithstanding dissent e.g. "Small business is, apparently, the opposite of the weather: Everybody praises it, and everybody does something about it. But all this posturing is based on bad economics and worse politics" (Postrel, 1994), SMEs are now seemingly central to economic policy worldwide and are accorded a pivotal role in for example, Europe, the US and Asia in securing national competitiveness, embedding the entrepreneurial spirit, securing economic growth and mass employment - 'European SMEs are a key to delivering stronger growth and more and better jobs – they make up a large part of Europe's economy: there are some 23 million SMEs in the EU, providing around 75 million jobs and accounting for 99% of all enterprises'[1]; a significant demographic (in economic and social terms). Furthermore, they are considered to be one of the principal driving forces in economic development and are said to form the 'backbone' of the market economy.

---

[1] European Commission (DG Enterprise) website:
http://ec.europa.eu/enterprise/entrepreneurship/index_en.htm retrieved on 18.12.04

Notwithstanding, the industrial structure of regions and largely 'academic' debates as to the contribution of SMEs to job creation, specifically 'net job creation' and/or 'job destruction' (a subject that seems to have occupied scholars more than policy makers), a competitive SME sector is now heralded as key to sustainable development, innovation and productivity (regardless of the empirical evidence that supports or undermines this proposition). In addition, SMEs are considered to endow national, regional and local economic structures with resilient industrial systems. For example, Jacobs (1969) and M. Porter (1990) note that concentrations or intensities of enterprises in e.g. a particular sector or region endow that sector or region with competitive advantages (re competition for knowledge and new ideas) while Rothwell (1983 and 1984) emphasises that large and small firms complement and succeed each other in the innovation and diffusion process.

SMEs are also lauded for their flexibility and ability to adapt quickly to changing market demand and supply situations. Cohen and Levinthal (1989) suggest that small firms are particularly adept at developing the capacity to adapt new technology and ideas developed in other firms and are therefore able to appropriate some of the returns accruing to investments in new knowledge made externally, while Luetkenhorst (2004) and others explain that as compared to larger firms SMEs are more naturally flexible, enjoy a closer proximity to customers and a therefore more responsive to customer needs and are not encumbered by layers of management and bureaucracy (see also Scherer above) which enable them to make decisions more quickly.

It also generally asserted (and accepted by policy makers) that SMEs provide positive externalities to their surrounding (local or national) economy, complementing scale-intensive large firms, and that they make input factors available at higher quality or lower prices, or create innovations on which consumers or other producers in the value chain (upstream or downstream) may build. Indeed, according to for example Audretsch (1995) and others (see above) small firms account for a disproportionate share of new product innovations, given their low R&D expenditures.

Throughout Asia, SMEs are lauded for their ability to provide employment, support economic growth and thus economic and political emancipation of minorities, contribute to the alleviation of poverty and assure more equitable distributions of wealth and democratic power throughout society and support economic growth (as explored variously by, for example, Jovanovic (1982, 2001); Ericson and Pakes (1995); Audretsch (1995); Hopenhayn (1992); Lambson (1991); and Klepper (1996)).

This major shift in public policy focus, during the early 1980s, towards the promotion and development of new small firms as *the* vehicle for job creation, which it is largely attributed to Birch's work in 1979 ensured that the SME sector would be a key focus for policy makers, politicians, academics and has sustained the diffusion of the incubator concept throughout the world. This investigation has noted that later empirical evidence that has challenged both Birch's findings and other contemporary notions, for example that SMEs are more innovative than large firms, etc, and which might reasonably be expected to have dented policy maker's continued enthusiasm for SME friendly initiatives has evidently failed to do so.

7.3 Observations on Business Incubation

Virtually every country in the world now has a government department, (or division) or governmental agency tasked specifically with promoting the viability of the SME sector. These ministries and agencies have now developed a well-established arsenal of policy instruments to promote SMEs. Irrespective of context, however, SME related policies - including the current widespread support for the incubator modality - have generally evolved via a process driven by local/regional crises (e.g. industrial restructuring) or underdevelopment, a lack of alternative development models, and as flowing from an expectation that regional and local authorities with direct responsibility for regional economic affairs i.e. regeneration, should be seen to implementing strategies and plans to arrest industrial decline and revitalise their communities.

As is evident from the literature reviewed in Chapter 2, in fostering conditions to support and enhance the SME contribution to regional economic

dynamics, economic developers and planners aim to derive a range of other social benefits that are also frequently attributed as products of a vibrant SME sector. Consequently, definitions of business incubation reflect significant variations in the nature, level, aims and objectives, roles and mandates of an 'incubator' (explored in Chapter 3-5) which illustrate the level of definitional and conceptual heterogeneity that pervades both the literature and the nature and organisation of the industry. This has included, as observed in Chapter 3, the evolution of incubators not only concerned with supporting specific high-tech industries or sectors but also social economy incubators, incubators supporting arts, crafts and cultural businesses and incubators targeting specific types of entrepreneur (e.g. graduates, academics, etc).

The socio-economic-political pressure to develop and implement new approaches to support industrial restructuring and regional regeneration that characterised so much of the policies and politics of the 1980s (in the UK and the USA) provided not only the context in which business incubation evolved but explains, in part, the rate at which business incubation has been diffused and adopted within a largely neo-liberal macroeconomic policy framework by regional authorities looking to stimulate regional economic growth dynamics. It is, however, unclear as to when the deployment of business incubators became a programmed policy action as opposed to an organic development in response to local needs and conditions driven by local energetic actors/institutions keen to develop new approaches.

As noted in Chapter 1 (Figure 1), the development of business incubation at the conceptual level and as a specific instrument of policy has occurred within a 'fast policy' environment (Peck and Tickell, 2002) wherein new concepts are generally diffused and adopted (often in the absence of detailed or even compelling empirical evidence that would justify the nature or scale of public investment) by regional policy makers hungry for new solutions and an apparent boundless enthusiasm for new approaches. It is also noted that the diffusion and adoption of the modality throughout the 1980s, 1990s and into the 21st century, has occurred at a time when the nature of governance, particularly economic governance has been changing with responsibility for the design and execution of

economic strategies and plans increasingly devolved to regional authorities and agencies (Frenz and Oughton, 2005). In the UK, as elsewhere in Europe, this coincided with the evolution of the European Union, the development of EU regional policy and the creation of the structural funds with local attendant regional and local structures that evolved to administer them. The EU structural funds, as noted in Chapter 3-5, have been particularly instrumental in supporting the formulation and execution of economic policy at the regional level and fuelling the proliferation of business incubators (including BICs) in Europe; providing significant sums for the creation of the infrastructure and provision of incubator services (channelled into incubators as part of regional/urban regeneration strategies and plans – as noted in Chapter 3, the concentration of incubators generally accords with population density and there are relatively few incubators in areas with a relatively low population density).

Moreover, the regional and local technocracies that have evolved to administer these funds have became increasingly empowered and instrumental in the development of regional economic and strategies and plans negotiated within the framework for national economic and social policy agreed between the EU Commission and national governments. As regards the adoption of business incubation/incubators as an instrument of regional policies, there also appears to be something of a 'magpie-like' quality in the appreciation and appropriation of the modality by policy makers insofar as business incubation/incubators have been (and arguably still are) perceived as an 'attractive solution in that they are regarded as a legitimate, worthwhile endeavour (particularly in the absence of convincing alternative approaches) and a s being a form of intervention that works (or at least does less harm than good). It is a feature of this 'magpie-like' approach to policy making that policy makers are seemingly quick to assume a notion or concept observed or rather perceived as successful in a specific context may be immediately transplanted and installed in a new environment irrespective of the different factor conditions that prevail therein.

The physical dimension of incubators/incubation relative to the perception that incubators/incubation delivers results should also not be underestimated. Incubators are often 'bright and shiny', eye-catching' developments programmed

as flagship regeneration projects that arrest the attention of the public and other policy makers alike. Unlike so many other business support programmes and interventions, business incubators are tangible i.e. they are clearly visible to stakeholders who might otherwise be unable to identify policy in action. In addition, the pressure to be doing something about industrial decline, regeneration, the SME sector, etc, and being seen to be doing so, is also a powerful driver (as illustrated in Chapter 1, Figure 1 with reference to 'growth machine' theory and the 'economic theory of bureaucracy'). The physical dimension would appear to have assumed increased significance, particularly business accommodations portfolios to sustainability as the virtual incubators identified for study (see chapter 5) had apparently ceased to be sustainable.

The rate of diffusion and adoption of the incubator modality by policy makers was found to be increasingly difficult to quantify. It was found that the number of incubators in the UK as reported by the UK's national incubator association may be significantly understated (by as much as 343%). While largely driven in the early stages of the industry by regional policy makers and now increasingly endorsed by national governments business incubation/incubators account for increasing levels of public investment. Given the increased scale of the industry, increasing competition for patronage - political and financial, finds the industry and individual incubators under increasing pressure to produce more compelling rationales, definitions and performance metrics to attract and sustain public sector support.

There is an anxiety within and outwith the community, in the UK at least (and observed in the US), that the rate at which incubators are being set up and the level of addition will ultimately undermine the ability of funding agencies i.e. local authorities and regional development/enterprise agencies) to adequately resource them all. Moreover, as noted in Chapter 5, as the additions (which in any event dilutes the available public investment) and in particular the level of differentiation within the industry increases, there are those within the industry that are concerned that the concept is being deconstructed, compromising its integrity and thus eroding or confusing public sector understanding of the modality and potentially

undermining the support (political and financial) that the modality currently commands.

It was evident, during this research, that a number of incubators and incubator associations are increasingly keen to establish a fixed, conceptual understanding and definition as to what an incubator is, and is not, as a means of differentiating or rather distinguishing the form of business support they provide (for the benefit of their stakeholders and sponsors) from other provision that is erroneously perceived as comparable i.e. organisations that adopt the name 'incubator' without providing the attendant services (or services of a nature or level that are considered within the incubator community as integral to the incubator identity).

However, to better establish a discernible level of 'daylight' between what a maturing incubator community perceives 'incubators' and 'incubation' is or should be, incubator associations may find that they will need to be more discriminating themselves as regards who or what they admit to their rank and file. In their infancy, and as a bid to assure their own sustainability, it might be argued that incubator associations have defined themselves by the 'lowest common denominator' so as not to delineate the standard or criteria for membership at too exacting a level so as not to deny membership (and the associated revenue stream derived from member subscriptions at a stage in the association's development when they are endeavouring to establish a critical mass).

Pursuant to the entry policies explored above, and notwithstanding the suggestion that business incubation should be concerned with new businesses, it is suggested in the incubator literature (generated within and outwith the incubator community) that incubators should operate selection policies i.e. apply admission/entry criteria and focus or select where they add value. In the UK, according to UKBI's National Business Incubation Framework (2004, p.4) while it is acknowledged therein that incubator clients should be appropriate to the "objectives of the incubation environment and its stakeholders" and that "the selection policy will differ from one incubation environment to another, depending on the mission statement and overall objectives [it is assumed that most clients

admitted to incubation environments] should be admitted on the basis that they demonstrate the following characteristics:

- Exhibit potential for growth;
- Meet specified targets;
- Be able to put forward a business idea/plan;
- Be willing to accept and act upon the advice/mentoring provided; and
- Have (or be able to develop) the capacity to pay for the facilities and services".

In any event, and in consideration of the incubator operations visited in the course of this research and discussions with incubator managers, it is submitted that this and such other 'entry criteria' as may be applied within or required of the industry are generally less than exacting and that they often appear little more than a nod to the notion that an incubator should be selective as regards who they elect to support. Naturally incubators look to provide accommodation and services to viable propositions with the potential for growth not least because of the revenue an incubator hopes to secure vis-à-vis rents and from the provision of other services (whether they be subsidised or provided at commercial rates). Further, the notion of a 'capacity to pay' is in any event generally imperative for incubator management insofar as they are largely dependent on the revenue from tenants (unless wholly subsidised and that the future of the subsidy is secure) to support the bulk of all incubator operations including personnel costs i.e. their own jobs (i.e. patronage may be temporary and outwith an incubators control whereas income from tenants is something over which they have and can exercise direct control).

This undeniable financial imperative may in fact explain the nature of incubator entry criteria being espoused by incubator associations i.e. that the 'selection' of tenants is based on their commercial viability without necessarily prescribing degrees of innovation or the nature and level of growth that an incubated firm must achieve (over and above that required to pay their rent/for services). Indeed, as may be observed from the UKBI criteria (above) the fact that an incubated business be 'new' is not in fact a stipulation.

In practice the measure of 'newness' as applied by incubators is, in any event, arbitrary or remains (deliberately) ill-defined so as to be not unduly prescriptive. Further it has been suggested that incubator models focussed exclusively at supporting new businesses may be fundamentally flawed as being unsustainable without significant subsidy insofar as the rental income and the level at which this is may be charged to start-up businesses is unlikely - of itself - to support the delivery and development of substantive incubator services over and above limited firm-level benefits to the tenants (i.e. incubator operations and services are not merely a factor of the aims and objectives of the incubator but also the level of financial return that can be generated from tenants and assisted businesses).

As regards those incubators that do present themselves as prima facie concerned with supporting for example only 'innovative' businesses (a stipulation of EU BICs) or for example specific technologies and as having a more rigorous or selective criteria for admission over and above basic commercial viability, they too are nevertheless largely subject to an overriding financial imperative. It has been suggested that unless an incubator is financially secure and has established revenue streams from e.g. anchor tenants, incubated and 'grown' businesses and other off-site activities such as public commissions/service contracts and consultancy (or unless heavily subsidised) it must favour businesses with a capacity to pay as opposed to perhaps those businesses or innovators developing/hoping to commercialise, for example, blue sky research (in a particular technology) as the return may be so far removed from the present and/or the technology so insufficiently mature to support the generation of revenues. This is perhaps illustrated by Lee Valley BIC's decision to defer a return on its investment – i.e. in exchange for assistance (services and accommodation) the BIC took equity in assisted businesses instead of rent); a decision which ultimately forced it into administration as the rate of return was in no way adequate to cover the BICs operating costs. In other words, in practice, incubators are often forced 'pass' on radically innovative propositions or technologies in favour of perhaps a 'less exciting' or less radically innovative businesses which have the capacity to pay their incubator bills.

Indeed, herein lies one of the dichotomies observed in the course of this research, as while incubators are often understood to be concerned with innovatory high-technology businesses and are often perceived and/or presented by stakeholders as there to offer specialist support to innovating high-technology companies, the importance of the technology or 'radicalness' or 'novelty' of the innovation is often overplayed and it would be more true to say that they are in fact concerned with supporting commercially viable propositions (high-tech or otherwise) i.e. the commercial viability of tenants and businesses assisted is key to the viability of the incubator and more so than the degree of innovation present in the business. Of the multiple incubators visited in the course of this research, they have been found to be incubating or providing homes for high-tech and low-tech businesses in a myriad of technologies to social enterprises, charities, and other business support organisations including virtual incubators and virtual technology incubators (e.g. CENAMPs).

The notion that incubated firms are supported and ultimately released or moved on from their incubator, or that incubators should or ordinarily operate exit strategies, is one that persists in the literature and in the stakeholder community. This understanding or assumption although, prima facie, consistent with the notion that incubated firms evolve beyond a fragile 'infant' state and reach a level of development where they are robust enough to survive outwith the incubator, is somewhat erroneous insofar as this was not generally observed in practice (It is a misconception, however, that few within the incubator community have been concerned to correct given the importance of mature businesses to incubator revenues (see below)).

In the UK, for example, UKBI's National Business Incubation Framework (2004, p.4) suggests that incubators should operate exit policies which should include "setting a maximum time limits (e.g. three years); stepped rents (gradually increasing each year); incentives to exit; removal of subsidies; [and] setting growth targets which have to be met". Further, from the literature, Brooks (1986, pp.24-29) submits that incubatees should enter an incubator continuum wherein start-ups enter an "economic growth incubator" in order to gain access to the incubator's external support network, shared support services, and the resources

of e.g. the local university affiliated with the incubator and that as they attain maturity should move into a real estate incubator which provides office space and shared services [i.e. services are withdrawn or provided at more commercial rates].

In the course of this research, however, there is little to suggest (as may be observed from the exit criteria operating amongst, for example, the East Midlands incubator sample, above) that exit policies are practised or enforced with any real vigour. In fact, it would appear that it is normally a case of incubated businesses outgrowing their incubator (i.e. requiring bigger premises) that prompts them to leave over and above anything an incubator 'exit policy' might stipulate.

Moreover, in practice many incubators have been prompted to extend their accommodation portfolio to accommodate, for as long as possible, growing and maturing businesses - including businesses that are anything but 'fledglings' - thus extending their capacity to tap into what is an important and potentially lucrative source of revenue (i.e. as the businesses increase in scale, so too does the rental income that might be derived from them) and which can then be used to cross-subsidise other incubator operations and services. Indeed, as incubators reach maturity and extend their capacity (accommodation portfolio) this has apparently prompted many to re-define facilities and operations on site so as where previously the whole site may have been defined publicly as the incubator, a distinction might be drawn on-site between 'fledgling' or start-up businesses accommodated in smaller 'incubator units' and more mature businesses which are often presented as occupying larger units i.e. 'grow-on space'. Again this would appear to be consistent with the presumption that incubated firms move along a continuum of incubators services as they grow and that some incubated firms may reach a point where assistance is still required to grow the business beyond this 'infant' state. In practice, however, grow on space is often occupied by businesses that have not started life in the incubator and may have been established and trading for years.

Again, just as entry criteria are somewhat 'fluid', there is apparently no directive in for example the US, Europe or Asia that stipulates when support

should cease (over and above, in Europe, for example State Aid rules which stipulate pursuant to the de minimis threshold, that private sector businesses should not receive more than €100k of State Aid over any three year period, taking account of all state aid that the organisation might receive from any source). It is arguable as to whether this is effectively policed by the EU and/or within the incubator community with any real vigour. In any event, even State Aid rules seem to have been sidestepped by the EU Commission's recent approval of a German scheme wherein the government will subsidise the provision of incubator accommodation and services to business. At the time of writing the businesses are said not receive the grant directly and consequently the scheme is said not to fall within the scope of State Aid rules and regulations[2].

It should also be noted, as observed in Chapter 3, that contrary to the general assumption that incubators are exclusively concerned with the provision of services to start-ups/new businesses, many of today's incubators were actually conceived as facilities for the provision of an integrated package of services and accommodation for new AND existing businesses (e.g. technology businesses and/or businesses with 'growth potential'). Of the business incubators studied in the course of this investigation (European and UK) it is clear, notwithstanding a popular misconception to the contrary, that facilitating business start-ups is but one facet of their operation (see case studies above) and that this activity is an important constituent in the incubator's business portfolio and as a generator of revenues.

Further, it has been noted in the course of this research that a number of BICs and other incubators are developing increased accommodation portfolios that are not necessarily concerned exclusively with supporting fledgling firms. Moreover, a number of BICs and other incubators lacking the capital (political or financial) to extend their range of 'owned' accommodation are however being contracted by stakeholders to manage other publicly owned business accommodation which again is not necessarily for exclusive occupation by new or fledgling businesses.

---

[2] European Commission Press Release, 2005, State aid: Commission endorses German aid scheme for tenants of technology centres and incubators, Reference: IP/05/536; Date: 03/05/2005.

7.4 The Impact of Business Incubators

As illustrated in Figure 1 (Chapter 1), it is anticipated that evaluation and standardisation or regulation are a foreseeable response to the scope, scale and maturity of the industry and, moreover, the fiscal pressure that will escalate as the industry becomes more competitive and as public funding is stretched to continue to support the proliferation of incubators within the economy. As such, and as articulated by a number of stakeholders interviewed in the course of this research, the incubator community should be braced to withstand more detailed and penetrating scrutiny and be prepared for a more penetrating analysis of its activities.

However, with more than 20 years of regional economic development and providing SME support instruments including business incubation, part financed in Europe by the EU structural funds, there is relatively little evidence or rather compelling evidence (at either a macro or micro level) that can identify enhanced regional economic performance attributable to these programmes or instruments i.e. that calculates a return for the EU's investment. It should be acknowledged, that the apparent absence of an evidential foundation (let alone a convincing evidential foundation) for so much policy and public investment is not confined to Europe and was equally found to be lacking in the US and Asia.

A review of the rather limited literature that purports to 'evaluate' the impact of business incubators reveals that the quantitative measures, as applied within or to the incubator community, are rarely properly or adequately descriptive. Indeed, most incubators (European and UK) and external or independent evaluations do not use sophisticated methods or highly quantifiable or comparable techniques to document and/or validate their impact and/or the degree and extent to which they have 'added-value' and instead rely more on publicising specific success stories.

Surprisingly, given the level of public investment in the practise of business incubation in the US, EU and elsewhere in the world, there seems to have been little appetite within or outwith the incubation industry for a more systematic

and exacting evaluation that would provide evidence that the level of commitment to business incubation (political and/or financial) is warranted. A number of explanations have been offered, during the course of this investigation, by incubator management, staff and stakeholders. It has been suggested, for example, that the nature or organisation of the industry and the scope of incubator operations does not lend itself to the imposition of evaluation metrics that are overly prescriptive or rigid and fail to capture the nature and level of incubator interventions in all their variety. Another and more candid explanation offered during this research acknowledged that while there are those that might wish to evaluate the performance and contribution of incubators they generally lack the influence and authority (including national, regional and local government) across the industry to require incubators to co-operate with or submit to detailed scrutiny; this may change in the UK as regional development agencies are not only responsible for allocating national government funds at the regional level but also EU structural funds.

In the absence of a more systematic and exacting evaluation that would provide evidence that the level of commitment to business incubation is warranted it should nevertheless be noted that incubation is being delivered in an increasingly 'results oriented' environment. This relatively new orientation is attributed in the main to:

(a) drive to better understand the business incubation phenomenon, particularly amongst stakeholders (economic development managers and agencies, academic researchers and practitioners), especially as regards the nature, scope and scale of incubator activity;

(b) a change in the level of interest and oversight exercised or sought by stakeholders and sponsors;

(c) a change in the dynamics of stakeholder/sponsor/incubator relations i.e. the increasing maturity of the industry, an increased desire to validate the incubator modality and manage/co-ordinate the work of incubators; and

(d) new conditions for incubator operations that include the increased scope and scale of the industry, new entrants and increased competition for patronage (political and financial).

7.5 Qualitative & Quantitative Results

Notwithstanding problems associated with attribution; inherent difficulties in defining in precise terms - using either qualitative or quantitative indicators (and/or using combinations thereof) - incubator activities (inputs), their application and interpreting individual and/or aggregated effects (outputs); this research has nevertheless (with the support of NEBIC) sought to investigate the impact of incubators on assisted firms, specifically NEBIC assisted firms.

Given the general consensus found within literature for the proposition that SMEs are engines of growth that energise the dynamics of regional economic development and the prevailing policy consensus that business incubation is a positive force in the regional economy addressing a market failure by supporting and enhancing the performance of incubated firms, this research tested the following propositions with a view to establishing an evidential base for public confidence in the modality:

1. Incubated firms are more innovatory than non-incubated firms (as measured by novelty);
2. Incubated firms are more innovatory than non-incubated firms (as measured by their propensity to innovate);
3. Incubated firms are more likely to invest/incur business expenditure related to R&D (BERD);
4. Incubated firms and the R&D/Innovation effort is more likely to be commercial i.e. market led/focused than non-incubated firms;
5. Innovation within incubated firms is more likely to be the outcome of strategies and plans than non-incubated firms;
6. Incubated firms are more likely to accord a value (a higher value) to product/service innovations and, for example, their role in/importance to extending product/service ranges, market share and penetration and product/service quality than non-incubated firms;
7. Incubated firms are more likely to accord a value (a higher value) to process innovations and, for example, their role in/importance to reducing

operating costs (materials, energy and labour), improving flexibility and increasing capacity.

8. Incubated firms are more likely to lever public support or collaborate in the development of innovatory products and processes than non-incubated firms.
9. Incubated firms are more likely to adopt flatter management structures that will enhance business performance as measured with reference to innovation and/or growth
10. Incubated firms are more likely to value and protect IPR than non incubated firms
11. Incubated firms are more likely to employ ICT in their business, particularly advanced ICT applications;
12. Incubated firms are more likely to be quality conscious and have secured quality accreditation than non-incubated firms;
13. Incubated firms are more likely to engage with and avail themselves of public support for business and technology development;
14. Incubated firms will experience higher rates of growth than non-incubated firms as measured by average increases in turnover; and
15. Incubated firms will experience higher rates of growth than non-incubated firms as measured by average increases in employment.

As noted in Chapter 6, from a visual inspection of the data many of the hypotheses tested apparently held true i.e. the proportion of BIC incubated firms in the study demonstrating the aforementioned behaviours and characteristics was generally higher than the non-incubated firms that participated in the study. The data was however examined further. Data was cross-tabulated (by respondent type, and bivariate analyses were conducted (e.g. the Chi-Square was calculated) to identify relationships between variables and to identify statistically significant results.

Using SPSS to calculate the Chi-Square in order to test for statistically significant relationships between respondent types and variables associated with 'innovative' or 'enterprising' behaviours.

In summary, while it was expected that incubator respondents would demonstrate more 'innovative' or 'advanced' behaviours as a consequence of being in the incubator environment evidence was found for 'Hypothesis 1: Incubated firms are more innovatory than non-incubated firms (as measured by novelty)' and 'Hypothesis 2: Incubated firms are more innovatory than non-incubated firms (as measured by their propensity to innovate)'.

For example, significant relationships were found between respondents reporting product, process and administrative innovation with a greater proportion of incubated firms reporting the highest levels of novelty i.e. innovations (product, process and administrative) 'New to their market' and 'New to their industry'. Significant relationships were also found as between respondents reporting 'New & Original Breakthrough(s)' and for respondent propensities to innovate new products. However while the data supports 'Hypothesis 2' in respect of incubated firms' higher propensity for product innovation the sample size does not support the same conclusion as regards process innovation.

Evidence was also found for 'Hypothesis 3: Incubated firms are more likely to invest/incur business expenditure related to R&D (BERD)' with significant relationships found between respondents reporting BERD, specifically 'In-House', 'Acquisition of External R&D', 'Acquisition of Machinery & Equipment', 'Acquisition of External Knowledge', 'Training' and 'Internal/External Marketing'. Incubated respondents were again proportionately more likely to report these 'innovative' or 'enterprising' behaviours than non-incubated firms.

Evidence was also found for 'Hypothesis 6: Incubated firms are more likely to accord a value (a higher value) to product/service innovations and, for example, their role in/importance to extending product/service ranges, market share and penetration and quality than non-incubated firms'. Significant relationships were identified between respondents according importance to product innovation and its role in 'Extending product range', 'Opening new markets and/or increasing market share' and 'Improving quality'. Incubated respondents were

again proportionately more likely to report these 'innovative' or 'enterprising' behaviours than non-incubated firms.

Evidence was also found for 'Hypothesis 10: Incubated firms are more likely to value and protect IPR than non incubated firms' with significant relationships observed as between respondents according importance to 'Patents & Patent Protection', 'Trademarks & Trademark Protection' and 'Copyright & Copyright Protection' but not 'Confidentiality Agreements' or 'Pay and reward strategies' as a means of protecting IPR. Incubated respondents were proportionately more likely to accord a high importance to protecting Patents, Trademarks, and Copyright.

Some evidence was found for 'Hypothesis 7: Incubated firms are more likely to accord a value (a higher value) to process innovations and, for example, their role in/importance to reducing operating costs (materials, energy and labour), improving flexibility and increasing capacity'. However, the sample size did not support a substantive conclusion in respect of the results obtained.

Similarly, some evidence was found for 'Hypothesis 8: Incubated firms are more likely than non-incubated firms to lever public support or collaborate in the development of innovatory products and processes than non-incubated firms'. Again, while significant relationships were observed for a number of the variables tested to explore this proposition, the sample size does not support substantive conclusions in respect of the results obtained. For example, there was little to indicate from a visual inspection of the data, that incubated respondents worked more collaboratively in the development of product or process innovation than non-incubated respondents. Significant relationships were nevertheless observed as between type of respondent reporting product innovations 'Developed in consultation with customers', 'Developed in co-operation with other institutions', 'Developed with the assistance of business support agency staff' and 'Developed with financial assistance/grants'. However with regards to three of these variables, namely product innovation 'Developed in co-operation with other institutions', 'Developed with the assistance of business support agency staff' and 'Developed

with financial assistance/grants', two cells (50%) had an expected count less than 5 and thus do not support a substantive finding.

As regards respondents reporting collaboration in connection with process innovations the only significant relationship identified was in respect of product innovation 'Developed by other businesses/institutions and implemented by respondents'. However, again due to the sample size, two cells (50%) had an expected count less than 5 and again this has not been interpreted as being sufficiently evidential to support the hypothesis.

No relationship could be found as regards innovation and market focus and no relationship could be found between the types of respondent and whether innovation in respondent firms was the outcome of strategies and plans nor could any relationship be identified as regards type of respondent and their management characteristics. There was little to indicate, however, that the occurrence of innovation in respondent businesses varied significantly by respondent type i.e. incubated and non-incubated.

Some evidence was however found for 'Hypothesis 11: Incubated firms are more likely to employ ICT in their business, particularly advanced ICT applications than non-incubated firms'. Significant relationships were detected concerning the application of ICT in respondent businesses, specifically in connection with the operation of 'Intranets', the application of 'Computer Assisted Design' and 'Other Advanced ICT Applications'. While proportionately more incubated respondents reported that they operated an 'Intranet' or 'Other Advanced ICT Applications' than non-incubated respondents, the reverse was however true of 'Computer Assisted Design'. The results obtained therefore neither support nor disprove the hypothesis.

Some evidence was also found for 'Hypothesis 12: Incubated firms are more likely to be quality conscious and have secured quality accreditation than non-incubated firms'. Significant relationships were also found in connection with respondent's commitment to quality, specifically 'ISO 9000' accreditation, 'Environmental standard(s)' and 'Accreditation with private sector businesses as a

preferred supplier'. However, as noted above, while proportionately more incubated respondents reported that they held 'Environmental standard(s)' and had secured 'Accreditation with private sector businesses as a preferred supplier', it must also be acknowledged that proportionately more non-incubated respondents had secured 'ISO 9000' accreditation. Again, the results obtained neither support nor disprove the hypothesis.

Similarly, some evidence was found for 'Hypothesis 13: Incubated firms are more likely than non-incubated firms to engage with and avail themselves of public support for business and technology development'. With reference to the degree and extent to which respondents had availed themselves of public-sector business support and assistance, a significant relationship was noted between respondents reporting that they had benefited from 'Technology Development Programmes', 'Technology Acquisition Schemes', 'Management Information Programmes' and 'Other public-innovation related support'. While proportionately fewer incubator respondents than non-incubated respondents reported that they had benefited from 'Technology Development Programmes' and 'Management Information Programmes', a higher proportion reported that they had benefited from 'Technology Acquisition Schemes' and 'Other public-innovation related support'. The results obtained neither support nor disprove the hypothesis.

No evidence was found for:

Hypothesis 4: R&D/Innovation effort is more likely to be commercial i.e. market led/focused in incubated firms and than non-incubated firms.

Hypothesis 5: Innovation within incubated firms is more likely to be the outcome of strategies and plans than non-incubated firms.

Hypothesis 9: Incubated firms are more likely to adopt flatter management structures.

Hypothesis 14: Incubated firms are more likely to have experienced growth than non-incubated firms as measured by increases in turnover.

Hypothesis 15: Incubated firms are more likely to have experienced growth than non-incubated firms as measured by increases in employment.

It is acknowledged, however, that any and all results obtained to test the hypotheses (above) could be explained by a selection bias inherent in the sample i.e. NEBIC selects businesses or individuals - deliberately by the application of specific criteria and supported by other intuitive judgements (see Chapter 6) - who are likely to be more innovative and likely to be growth orientated.

Incubated firms and stakeholders did, however, maintain that the BIC provided significant added value enhancing individual firm performance (albeit not necessarily in readily quantifiable or comparable ways) though interestingly the perception of incubated firms did differ to an extent from presumptions in the existing literature and indeed with the perception of incubator (BIC) staff as to which services in the BIC portfolio added more value than others. As noted in Chapter 5, (see Figure 5.6), BIC tenants accorded a high value to 'Pre-Incubation Services', 'Information Services', 'Advice and Support for product development', 'Business Planning and Company Formation Services'. Interestingly, and contrary to the importance accorded to it in much of the literature (generated within and outwith the incubator community) 'Raising finance (access to R&D grants and seed-corn funding)' was marked for a lack of utility amongst BIC tenants.

In the course of the interviews with NEBIC tenants (41) a number of other elements of the incubator service/functions were highlighted for their utility. As noted in Chapter 5 (above) 41 respondents located at 31 of the 41 tenants interviewed indicated that key to their decision to locate and remain at NEBIC was/is the location of the incubator and the image that premises at the incubator lends their business. NEBIC tenants also pointed to the nature and quality of the accommodation (and flexible terms), as being important to the conduct of their business. Most surprisingly, however, was the fact that NEBIC tenants considered the nature and level of business services provided as less significant than the premises themselves. Moreover, the opportunity to network with other businesses (much vaunted in the literature generated within and outwith the business incubator community) was not regarded as being particularly significant. However, a number of other services and functions were cited by NEBIC tenants as being important to the conduct of their business:

- proximity or relationship with the region's universities;
- the ability of the incubator to facilitate links/collaborations with other business support agencies;
- assistance with the development of partnerships/technology collaborations;
- the availability of specialist facilities (e.g. access to rapid prototyping technology/equipment) and personnel i.e. technology specialists (engineers);
- co-location with similar businesses at similar stages in their development; and
- the knowledge that pragmatic, 'hands-on', intensive interventions and business assistance - general and specialist/technical - over and above the provision of information and advice, is immediately available.

While much of the public funding flowing into incubators prescribes the nature and level of assistance provided to tenants (particularly if the support is part funded by the European Regional Development Fund which somewhat absurdly assumes that an intervention or assistance is only meaningful if it requires 5 working days of assistance), clearly, it is their proximity to ad hoc, flexible support that incubated firms value most.

For example, one of the NEBIC tenants interviewed in the course of this research pointed to the fact that having responded to an invitation to tender from an automotive manufacturer to supply engine components (with a very short deadline for responses), they were assisted to prepare their business proposal by NEBIC staff experienced in the preparation and presentation of commercial tenders. Having made it to the shortlist, the NEBIC tenant was subsequently invited to present their proposals.

However, whereas as many of their competitors attended the presentation and presented technical drawings of the component to be supplied, the NEBIC tenant business was able to present, with support from the NEBIC staff and with immediate access to the NEBIC's rapid prototyping facilities, a 3D physical

mock-up of the component in addition to their technical drawings. This was cited by the NEBIC tenant as being particularly influential in the decision of the manufacturer to award them the contract as they were the only business shortlisted that had, in the timescale available to them, prepared technical drawings and tabled a 3D physical model.

The NEBIC tenant was at pains to stress that the impact of the support received from the NEBIC on their business and in the local economy should not be underestimated given that this has been instrumental in assisting the tenant to secure its first contract with a major automotive OEM providing a platform from which to diversify and grow the business and at the same time safeguard and create new jobs. The NEBIC tenant was also careful to explain that presenting a physical 3D model might not have occurred to them but for the NEBIC staff's suggestion but also that they were at an advantage insofar as the rapid prototyping equipment (which would be prohibitively expensive for them and any other comparable business to invest in) was immediately available on the NEBIC site enabling them to be more competitive insofar as this allowed them to project that, notwithstanding their size, they had the capability and capacity to respond quickly to the OEM's requirements which, it emerged ,was and is a key attribute the OEM looks for when selecting businesses to admit to its supply chain.

In conclusion, while this study attempted to find compelling evidence via this empirical investigation and elsewhere in the literature that would justify the current commitment to business incubation, notwithstanding anecdotal examples of intervention and effect (as outlined, by way of example, above) it has ultimately failed to do so. Indeed, where the evidence has pointed to significant differences between incubated and non-incubated firms there is nothing to suggest that these differences reflect anything more than differences in their character which, we must acknowledge, are not necessarily effects of being in an incubator environment (i.e. the results may simply be the product of a selection bias inherent in the nature of firms selected by incubators to admit to their facilities).

In addition, and as noted above, there appears to be a 'magpie-like' quality driving the proliferation of business incubators and a policy consensus or

confidence in the modality that appears to be based more on 'an article of faith' than a detailed understanding of their effectiveness. In any event, as competition for patronage (political and financial) becomes more acute, exacerbated in Europe by the redistribution of the structural funds and the number of new additions in the industry, it shall become increasingly important for policy makers to be more discriminating in their allocation of resources. As is evident, from a review of relevant literature – as illustrated in Figure 1 – the increased national scrutiny of regional economic development authorities and associated reporting requirements is expected, in turn, to prompt increased scrutiny of their agents (those executing regional economic, strategies, plans and their instruments). Whereas historically stakeholders may have been generally satisfied that incubation represent at least a genuine endeavour, public authorities in particularly are increasingly likely to pressed to report quantified economic effects.

Moreover as noted in Chapter 1, in the UK, regional development agencies are increasingly evaluated against new metrics stipulated by the Department for Trade and Industry (dti), namely 'public service agreements'. In addition, 'best value' performance indicators are being adopted (or imposed) across the public sector – in particular, regional and local government – to assess the return on public investment. This is likely to force regional economic authorities and development agencies to be more measured vis-à-vis their selection of approaches and projects to support. Indeed it may prompt them to seek consider whether the incubators within their region's business support infrastructure compliment or duplicate each other with reference to the nature and level of services they provide, their territorial coverage, their relative expertise and competencies; and whether or not they are in competition with each other for the same clients or resources and the degree and extent to which they risk over-supply i.e. whether incubator capacity is increasing without a concomitant increase in incubator capability or demand.

Fortuitously these new conditions appear to coincide with an increased concern to establish and communicate best practice and achievement within the incubator community and to stakeholders thus reinforcing the image and public sector confidence in the industry. This is motivated, in no small part, by a concern

to encourage and enable sponsors and policy makers with responsibility for allocating regional resources to be more discriminating in their investment decisions. This is, arguably, representative of the growing maturity of the industry as evidenced by the creation of national incubator associations; the establishment of business incubation as occupation with attendant professional standards and best practice frameworks. It is anticipated that eventually universities shall offer degree programmes with business incubation as their subject (though given the range of incubator objectives, communities served and different approaches this would require a rather broad curriculum) which may play an important part in educating incubator stakeholders to a point where they may become more sophisticated and discerning vis-à-vis the nature of 'incubators' they elect to support i.e. more able to draw a distinction, for example, between providers of accommodation and providers of accommodation and incubation services.

As for BICs in particular, it is evident from this research that they admit and assist a broad church of enterprises including new and existing businesses, high and low-tech businesses, industrial and service enterprises and other business support providers. As observed above, BICs are also host to social enterprises, charities, and graduate start-ups which have prompted the development of new approaches to reflect the broadening of their client portfolio and the nature of assistance these enterprises require.

BICs are entrepreneurial by their very nature and their capacity to reinvent and renew themselves; developing new services to meet new markets (new social, political and economic priorities) are an undoubted factor in their success/longevity. As regards their future, BIC facilities and their business development functions charged with securing grants or investment in the extension thereof and funding and/or commissions to support revenue operations are clearly critical. It is evident that despite the development of private revenue streams and notwithstanding the revenues BICs generate from their tenants, the importance of public funding (e.g. structural funds) will remain critical to incubator revenues (see also Chapter 5). To this end, stakeholder relations management is evidently a critical incubator management discipline, as is the task of embedding BIC operations within a regional authority's strategies and plans and as part of the local

and regional business support infrastructure and, so too is cultivating support for incubator operations within the business community in order to preserve patronage (political and financial - public and private) and so as to develop new business opportunities.

In the same vein, just as stakeholder relations management is increasingly important to the sustainability of incubators, so too is an incubator's public relations function in communicating achievement and success stories which further reinforce the 'incubator approach' as a valid endeavour and modality and, more specifically, an incubator's position within the business support infrastructure and in the consciousness of agencies and individuals with authority and responsibility for policy, economic development and regeneration strategies; and funding for business support projects and/or policy priorities. In a new climate for business incubation and incubator operations (as explored in Chapter 5) the ability of BICs to demonstrate added value and impact (if not a truly evidential base for support) shall become increasingly important and thus it may equally be in their interest to research and establish more appropriate and telling quantitative measures.

References

Acs, Z.J. and Audretsch D.B. (1987) 'Innovation, Market Structure, and Firm Size', Review of Economics and Statistics' 69, pp.567-574

Acs, Z.J., and Audretsch, D.B. (1988) 'Innovation in Large and Small Firms: An Empirical Analysis', American Economic Review, 78 (4), September, pp.678-690

Acs, Z.J. and D.B. Audretsch (1990) 'Innovation and Small firms'. Cambridge, MA: MIT Press.

Acs, Z.J. and Audretsch, D.B. (eds.)(1993) 'Small Firms and Entrepreneurship: An East-West Perspective'. Cambridge: Cambridge University Press

Acs Z.J., Audretsch D.B., Feldman, M.P. (1994) 'R&D Spillovers and Innovative Activity', Managerial and Decision Economics, 14, pp.131–38

Acs, Z.J. (1995) 'Symposium on Harrison's "Lean and Mean" Small Business Economics' 7 333-335

Acs Z.J. (1996) 'Small Firms and Economic Growth', in Acs Z.J., Carlsson B, Thurik R (eds) 'Small Business in the Modern Economy'. Blackwell Publishers, Oxford, pp 1–62

Acs, Z.J. and Preston, L. (1997), 'Small and Medium-sized Enterprises, Technology and Globalisation', Small Business Economics, Vol.9, No.1, pp.1-6

Acs, Z.J. (1999) 'The New American Evolution', in Acs, Z. J. (ed.), 'Are Small Firms Important? Their Role and Impact', Kluwer Academic Publishers, Dordrecht NL, pp.1-20

Acs, Z.J., Morck, R., and Yeung, B. (1999) 'Evolution, Community, and the Global Economy', in Acs, Z.J. (ed.), 'Are Small Firms Important?', Kluwer Academic Publishers, Dordrecht NL

Acs, Z.J., Carlsson, B., and Karlsson, C. (1999) 'The Linkages among entrepreneurship, SMEs and the macroeconomy', in Acs, Z.J.; Carlsson, B. and Karlsson, C. (eds.), 'Entrepreneurship, Small and Medium Sized Enterprises and the Macroeconomy', Cambridge University Press, Cambridge UK, pp.3-42

Acs, Z.J. and Audretsch, D.B. (2001) 'The Emergence of the Entrepreneurial Society', Swedish Foundation for Small Business Research, Stockholm http://business.ubalt.edu/hot/Acs_Paper.html accessed 29.08.05

Acs, Z.J. (2003) 'The value of entrepreneurial start-ups to an economy', Diebold Institute Entrepreneurship and Public Policy Project, Working Paper No 5. retrieved on 16.04.04 from website: www.dieboldinstitute.org/papers.htm

Adkins, D., (2001) 'A Report for the Japan Association of New Business Incubation Organisations (JANBO): Summary of the U.S. Incubator Industry', Athens, OH: National Business Incubation Association cited in Hackett, S.M. and. Dilts, D.M., 2004. A Systematic Review Of Business Incubation Research, Journal of Technology Transfer, 29, page 57 pub Kluwer Academic Publishers & Manufactured in The Netherlands

Aiginger. K. & Tichy, G. (1991) 'Small Firms and the Merger Mania', Small Business Economics, 3, pp. 83-102

Albors, J. and Kingham, D. (1998) 'A Pilot Project for the Stimulation of Co-operative Technological Development in the European SMEs: Euromanagement', in Management of Technology, Sustainable Development and Ecoefficiency. Edited by L.A. Lefebvre, R.M. Mason, and T. Khalil, Amsterdam: Elsevier, 1998, pp. 121–32.

Allen D.N. (1988) 'Business incubator life cycles', Economic Development Quarterly, 2(1), pp.19-29

Allen, D.N. and Weinberg, M. (1988) 'State investment in business incubators', Public Administration Quarterly 12 (2), p. 200

Allen D.N. and McCluskey, R., (1990) 'Structure, Policy, Services, and Performance in the Incubator Industry', Entrepreneurship, Theory and Practice, Winter 1990: pp.61-77.

Allen, D., and Bazan, E. (1990) 'Value Added Contributions of Pennsylvania's Business Incubators to Tenant Firms and Local Economies'. State College, PA: Appalachian Regional Commission and Pennsylvania Department of Commerce.

Almeida, P. and Kogut B. (1997) 'The Exploration of Technological Diversity and the Geographic Localization of Innovation'. Small Business Economics 9: pp.21–31

Almeida, P. (1999) 'Semiconductor Startups and the Exploration of New Technological Territory', in Acs Z.J. (ed) 'Are Small Firms Important? Their Role and Impact'. Kluwer Academic Publishers, Dordrecht, pp.39–50

Amirahmadi, H., and Saff, G. (1993) 'Science parks: A critical assessment'. Journal of Planning Literature, 8 (2), p.108

Aragon, L., and Landry, J. (2000) 'Get Hatched: How a farming town hatched a new way of doing business', Redherring, (January 1999)

Arbeitsgemeinschaft Deutscher Technologie- und Gründerzentren retrieved on 18.08.04 from website http://www.adt-online.de/zentren/karte.htm

Armington, C. and Odle M. (1982), 'Small business: how many jobs?', Brookings Review, 20, pp.14-17

Ashcroft B., and Love J., (1995) 'Employment change and new firm formation in UK counties, 1981-89', Papers in Regional Science v75, pp 483-500

Asheim, B. T. and Gertler, M. (2005) 'Regional Innovation Systems and the Geographical Foundations of Innovation'. In: Fagerberg, J., Mowery, D., and Nelson, R. (eds.) (2005): The Oxford Handbook of Innovation. Oxford: Oxford University Press, pp. 291-317.

Asian Association of Business Incubation retrieved on 07.07. 05 from website: http://www.aabi.info/aabi_incu/index.html

Atherton, A. and Lyon, F. (2001) 'Segmenting Business Support for Small and Medium Sized Enterprises', Research Report, Small Business Service

Atkinson, R., (1991) 'Some States Take the Lead: Explaining the Formation of State Technology Policies', Economic Development Quarterly 5(1), pp.33-44

Audretsch, D.B. (1995) 'Innovation and Industry Evolution'. Cambridge, MA: MIT Press.

Audretsch, D.B. and Vivarelli M. (1996) 'Firms Size and R&D Spillovers: Evidence from Italy', Small Business Economics, 8, pp.249–58

Audretsch, D.B. and Fritsch, M., (1996) 'Creative destruction: turbulence and economic growth', in HelmstÃdter, E. and Perlman, M. (eds) 'Behavioural Norms, Technological Progress, and Economic Dynamics: Studies in Schumpeterian Economics', pp. 157-150. Ann Arbor, MI: University of Michigan Press

Audretsch, D.B., and Thurik, A.R. (1997) 'Sources of Growth: The Entrepreneurial versus the Managed Economy', Tinbergen Institute Discussion Paper TI 97-109/3, Tinbergen Institute http://ideas.repec.org/p/cpr/ceprdp/1710.html accessed 06.01.04;

Audretsch, D.B., Carree, M.A., van Stel, A.J., and Thurik, A.R. (2000) 'Impeded Industrial Restructuring: The Growth Penalty', Tinbergen Institute Discussion Paper 2000-095/3, Tinbergen Institute retrieved on 09.09.04 from website: http://www.hwwa.de/Publikationen/Discussion_Paper/2000/114.pdf

Audretsch, D.B., and Thurik, A.R. (2001) 'What's new about the new economy? Sources of growth in the managed and entrepreneurial economies', Industrial and Corporate Change, Vol 10 No 1, March.

Audretsch, D.B. and Thurik, A.R. (2001) 'Capitalism and Democracy in the 21st Century: from the Managed to the Entrepreneurial Economy', in Mueller, D. C. and Cantner, U. (eds.), Capitalism and Democracy in the 21st Century, Physica-Verlag Heidelberg, pp. 23-40

Audretsch, D.B., Carree, M.A., and Thurik, A.R. (2001) 'Does Entrepreneurship reduce Unemployment?', Tinbergen Institute Discussion Paper 2001-074/3, Tinbergen Institute retrieved on 13.07.05 from website: http://www.spea.indiana.edu/ids/pdfholder/ISSN%2002-1.doc

Audretsch, D.B., Carree, M.A., van Stel, A.J., and Thurik, A.R. (2002) 'Impeded industrial restructuring: the growth penalty', Kyklos, 35(1), pp.81-98

Audretsch, D.B., and Fritsch, M. (2002) 'Growth regimes over time and space', Regional Studies, 36(2), pp. 113-124.

Audretsch, D.B. and Thurik, A.R., (2002) 'Linking entrepreneurship to growth', OECD STI Working Paper, 2081/2

Audretsch, D.B. (2002) 'Entrepreneurship: Determinants and policy in a European US comparison', in the Commission of the European Communities Green Paper 'Entrepreneurship in Europe' (21.01.2003), page 4

Audretsch, D.B. (2004) 'Sustaining Innovation And Growth: Public Policy Support For Entrepreneurship', retrieved on 12.09.04 from website: http://www.findarticles.com/p/articles/mi_qa3913/is_200409/ai_n9441582

Australia and New Zealand Association of Business Incubators (ANZABI) (1996) 'Business Incubation in Australia: Best Practice Standards and an Industry Profile'.

Bairoch, P. (1989) 'European Trade Policy, 1815-1914', Cambridge Economic History of Europe, vol. 8, New York: Cambridge University Press, pp.69-83

Baldwin, J.R., and Picot G. (1995) 'Employment Generation by Small Producers in the Canadian Manufacturing Sector', Small Business Economics, 7, pp.317–31.

Baldwin, J.R., and Johnson, J. (1999) 'Entry, Innovation and Firm Growth, in Acs Z.J. (ed) Are Small Firms Important? Their Role and Impact'. Kluwer Academic Publishers, Dordrecht, pp.51–77

Bannock, G. (2005) 'The Economics and Management of Small Business', Routledge
Baptista and Swann, P (1998) 'Do Firms in Clusters Innovate More?', Research Policy, Vol.27 (5), pp.527-542.
Barro, Robert J. 1990. 'Government spending in a simple model of endogenous growth', Journal of Political Economy 98, 5: pp.103-25.
Barro, Robert J., 27 (and Sala-i-Martin, 1999), 108 (1990) Economic growth. Cambridge, MA: MIT Press.
BBC (2000) 'Blair in talks over Nissan jobs', Monday, 31 July, 2000, 11:51 GMT retrieved on 03.03.05 from website: http://news.bbc.co.uk/1/hi/business/858265.stm
BBC (2001) 'From Datsun to Nissan' Thursday, 25 January, 2001, 17:18 GMT retrieved on 03.03.05 from website: http://news.bbc.co.uk/1/hi/business/1136490.stm
BBC (2001) 'Q&A: Why Nissan chose the UK' Thursday, 25 January, 2001, 12:54 GMT retrieved on 04.03.05 from website: http://news.bbc.co.uk/1/hi/business/1136312.stm
BBC (2005) 'New Nissan car 'will secure jobs', Wednesday, 2 February, 2005, 06:23 GMT, retrieved on 06.03.05 from website http://news.bbc.co.uk/1/hi/england/wear/4225291.stm
Bearse, P. (1993) 'The Evaluation of Business Incubation Projects- A Comprehensive Manual'. Athens, Ohio, NBIA
Bearse, P. (1998) 'A Question of Evaluation: NBIA's Impact Assessment of Business Incubators', Economic Development Quarterly 12 (4), pp.322-333
Beck, U. (2000) 'What is globalization?' Cambridge: Polity Press
Beck, T., Demirguc-Kunt, A., and Levine, R. (2003) 'SMEs, Growth, and Poverty: Cross-Country Evidence', http://www.worldbank.org/research/bios/tbeck/sme.pdf accessed 08.01.05
Biggs, T., Shah, M., and Srivastava, P. (1996) 'Technological Capability and Learning in African Firms', World Bank (Africa Region) Technical Paper.
Birch, D.L. (1979) 'The Job Generation Process', MIT Study on Neighbourhood and Regional Change, Boston, Massachusetts.
Birch, D.L. (1981) 'Who Creates Jobs? The Public Interest, 65, Fall, pp.3-14
Birch, D.L (1987) 'Job Creation in America: How Our Smallest Companies Put the Most People to Work', New York: The Free Press.
Blau, D. (1987) 'A Time Series Analysis of Self-Employment', Journal of Political Economy 95, pp.445-467
Birch, D., Haggerty. A., and Parsons, W. (1993) 'Who's Creating Jobs?' Cambridge (MA): Cognetico Inc.
Böhme, H. (1967) 'Big Business Pressure Groups and Bismarck's Turn to Protectionism: 1873-79', The Historical Journal 10, no. 2, pp.218-36
Bound, J., Cummins, C., Griliches, Z., Hall, B.H. and Jaffe, A. (1984) 'Who Does R&D and Who Patents?', in Griliches, Z.(ed.), 'R&D, Patents, and Productivity', Chicago, IL: University of Chicago Press, pp.21-54
Bowman-Upton, N., Seaman, S.L. and Sexton, D.L. (1989) 'Innovation Evaluation Programs: Do they Help the Inventors?', Journal of Small Business Management 27 (3), pp.23-30.
Braczyk, H., Cooke, P., and Heidenreich, M. (eds.) (1998) 'Regional Innovation Systems'. (1st edition) London: UCL Press.

Bridge, S., O'Neill, K., and Cromie, S. (1998) 'Understanding Enterprise, Entrepreneurship and Small Business', London, Macmillan.
Brock, W.A., and Evans, D.S. (1989) 'Small business economics', Small Business Economics, 1(1), pp.7-20
Broersma, L., and Gautier, P. (1997) 'Job Creation and Job Destruction by Small Firms: An Empirical Investigation for the Dutch Manufacturing Sector', Small Business Economics, 9, pp.221
Brooks, O.J. (1986) 'Economic Development Through Entrepreneurship: Incubators and the Incubation Process', Economic Development Review 4 (2), pp.24–29.
Broom, H.N., and Longenecker, J.G. (1993) 'Small Business Management', 8th ed. (Cincinnati, OH: South-Western) in Haksever, C. (1996) 'Total quality management in the small business environment', Business Horizons, retrieved on 16.08.04 from website: http://www.findarticles.com/p/articles/mi_m1038/is_n2_v39/ai_18124641
Brown, C., and Medoff, J. (1989) 'The employer size wage effect', Journal of Political Economy, 97(4) (October), pp.1027-1059
Brown, C., Medoff, J., Hamilton, J. (1990) 'Employers: Large and Small'. Cambridge, MA.: Harvard University Press cited in Beck, T., 2003, 'Small and Medium Enterprises, Growth, and Poverty: Cross-Country Evidence', World Bank Policy Research Working Paper 3178, December page 2
Brusco, S. (1982) 'The Emilian model: productive decentralisation and social integration', Cambridge Journal of Economics, 6: pp.167-184.
Brusco, S. (1990) 'The idea of the industrial district: its genesis', in Pyke, F., Baccattini, G., Senenberger, W. (eds) 'Industrial districts and inter-firm cooperation in Italy'. Geneva, Internatonal Institute for Labour Studies
Buchanan, J. and Tullock, G. (1962) 'The Calculus of Consent', University of Michigan Press
Buchanan, P.J. (1998) 'The Great Betrayal: How American Sovereignty and Social Justice Are Being Sacrificed to the Gods of the Global Economy', New York: Little, Brown, p.224
Burger, F. (1999) 'Business Incubators: How Successful Are They?' Area Development Online, (January)
Burrows, R. (1991) 'Deciphering The Enterprise Culture', London, Routledge.
Callejon, M., and Segarra, A. (2000) 'Business dynamics and efficiency in industries and regions: the case of Spain', Small Business Economics, 13(4), pp.253-271
Calzonetti, F., and Gatrell, J. (2000) 'State Science and Technology Planning in West Virginia: Challenges Facing Practitioners'. Economic Development Quarterly 14(4), pp.360-374
Campbell, C. D., Berge, J., and Olson, K. (1988) 'Change Agents in the New Economy: Business Incubators and Economic Development'. Minneapolis, MN: Hubert Humphrey Institute of Public Affairs.
Campbell, C. (1989) 'Change Agents in the New Economy, Business Incubators and Economic Development', Economic development Review, 7(2), pp.6-59
Carlsson, B. (1989) 'The Evolution of Manufacturing Technology and Its Impact on Industrial Structure: An International Study', Small Business Economics 1, pp.21-37

Carlsson, B. (1992) 'The Rise of Small Business; Causes and Consequences', Working Paper 357, 1992, The Industrial Institute for Economic and Social Research, Stockholm
Carlsson, B. (1996) 'Small Business, Flexible, Technology and Industrial Dynamics', in Acs, Z.J., Carlsson, B. and Thurik, R. (eds)_Small Business in the Modern Economy, Blackwell Publishers, Oxford UK, pp.63-125
Carlsson, B. (1999) 'Small Business, Entrepreneurship, and Industrial Dynamics', in Acs, Z.J. (ed.), 'Are Small Firms Important? Their Role and Impact', Kluwer Academic Publishers, Dordrecht NL, pp.99-110
Carree, M.A., and Thurik, A.R. (1997) 'Small Firms and Economic Growth', Research Memorandum 9708, Erasmus University Rotterdam
Carree, M.A., and Thurik, A.R. (1999) 'Industrial structure and economic growth', in Audretsch, D.B., and Thurik, R., (eds) Innovation, Industry Evolution, and Employment, pp. 86-110. Cambridge: Cambridge University Press.
Carree, M., van Stel, A.; Thurik, R., and Wennekers, S. (1999) 'Business Ownership and Economic Growth: An Empirical Investigation', EIM Research Report 9809/E, Zoetermeer retrieved on 24.03.05 from website: http://econpapers.repec.org/paper/fthmiklrr/9809_2Fe.htm accessed
Carty, A.J. (2003) 'Incubation in Canada: Moving to the Next Level', President, National Research Council 2003 Incubators and New Venture Conference Montreal, Quebec 22 January 2003
Castel-Branco, C. (2003) 'A critique of SME-led approaches to economic development', mimeo, Eduardo Mondlane University
Caves, R.E. (1982) 'Multinational Enterprise and Economic Analysis', Cambridge: Cambridge University Press.
Centre for the Study of Democracy, (undated) 'Policy and Legal Environment for the Growth of the SME Sector in Bulgaria', Introduction, page 1 retrieved on 13.08.05 from website http://www.csd.bg/artShow.php?id=10483
Centre for Process Innovation http://www.uk-cpi.com/main.asp
Centre of Excellence for Life Sciences http://www.celsatlife.com
Centre of Excellence for Nanotechnology, Micro and Photonic Systems www.cenamps.com
Centre of Excellence in Digital Technology and Media http://www.codeworks.net/content/80000/codeworks/home/home.asp
Cesaratto, Stirati S., Mangano A., Serrano F. (1996) 'The impact of innovation on employment, alternative interpretations and results of the Italian CIS', Università di Roma "La Sapienza", Publication No. 37 of the European Innovation Monitoring System (EIMS)
Chandler, A.D., Jr. (1990) 'Scale and Scope: The Dynamics of Industrial Capitalism', Cambridge: Harvard University.
Chinitz, B. (1961) 'Contrasts in Agglomeration', New York and Pittsburgh. American Economic Review, May, pp.279-89
City of Sunderland's website for Business and Investment. http://www.investinsunderland.co.uk/support-grants.asp accessed 19.07.05
Clapham, J. H. (1910) 'The Last Years of the Navigation Acts', English Historical Review 25 (July & October), pp. 480-501 and pp.687-707, respectively
Cohen, W. M., and Levinthal, R.C. (1989) 'Empirical Studies of Innovation and Market Structure' in Schmalensee, R., and Willig, R.(eds.), 'Handbook of Industrial Organization', Volume II, Amsterdam: North-Holland, pp.1059-1107.

Cohen, WM., and Levinthal, D. (1989) Innovation and learning: the two faces of R&D, Economic Journal, 99(3), pp.569-596

Commission of the European Communities (2003) 'Thinking small in an enlarging Europe', Communication from the Commission to the Council and the European Parliament, Brussels, COM 26 final, http://www.brad.ac.uk/irq/documents/archive/Thinking_Small.pdf accessed on 09.09.04

Commission of the European Communities (2004) 'Commission adopts a new definition of micro, small and medium sized enterprises in Europe' (Reference: IP/03/652, Date:08/05/2003) retrieved on 06.06.05 from website: http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/03/652&format=HTML&aged=0&language=EN&guiLanguage=en

Cooke, P. (1992) 'Regional Innovations Systems: Competitive Regulation in the New Europe'. Geoforum, 23, pp.365-382.

Cooke, P., and Morgan, K. (1994) 'The regional innovation system of Baden Württemberg', International Journal of Technology Management, 9, pp.394-429.

Cooke, P., and Morgan, K. (1994) 'The creative milieu: a regional perspective on innovation', in Dodgson, M., and Rothwell, R. (eds) 'The Handbook of Industrial Innovation', Edward Elgar, Cheltenham.

Cooke, P. (1998) 'Introduction: Origins of the concept'. In Braczyk, H.J., Cooke, P., and Heidenreich, M. (Eds.), 'Regional Innovation Systems; The Role of Governances in a Globalized World'. London: UCL Press. pp.2-25

Cooke, P., Boekholt, P., and Tödtling, F. (2000) 'The Governance of Innovation in Europe. Regional Perspectives on Global Competitiveness'. London, Pinter.

Cordis (2005) 'Commission approves state aid scheme for SMEs using incubators', (04/05/2005) retrieved from Cordis News website:ftp://ftp.cordis.lu/pub/innovation-smes/docs/results_from_cis3_for_eu_iceland_norway.pdf

Coriat, B. (1995) 'Organisational innovations: The missing link in European competitiveness' in Andreasen, L., Coriat, B., Den Hertog, F., and Kaplinsky, R., 'Europe's next step: Organisational innovation, competition and employment', Essex 1995, pp. 3-32.

COTEC (1998), 'El Sistema Español de Innovación. Diagnóstico y Recomendaciones'. Madrid

Crevoisier, O., and Maillat, D. (1991) 'Milieu, industrial organization and territorial production system: towards a new theory of spatial development', in Camagni, R (ed) Innovation Networks: Spatial Perspectives, London, Belhaven.

Culp, R.P., (1996) 'A Test of Business Growth through an Analysis of a Technology Incubation Program', Georgia Institute of Technology, Atlanta, Georgia.

Curran, J. (2000) 'What is small business policy in the UK for? Evaluating and assessing small business policies', International Small Business Journal, 18(3): 43-5

Dale, I., and Morgan, A. (2001) 'Job Creation – the Role of New and Small Firms'. Sheffield, Small Business Service.

Dannreuther, C. (1999) 'Discrete dialogues and the legitimisation of EU SME policy', Journal of European Public Policy, 6(3), pp.436-455

Davidsson, P., Lindmark, L., and Olofsson, C. (1993) 'Business Dynamics in the Swedish economy: A Regional Perspective', reported submitted to the EC Commission

Davidsson, P., Lindmark, L., and Olofsson, C. (1994) 'The trend towards smaller scale during the 1980's: empirical evidence from Sweden'

Davidson, P. (1995) 'SMEs and Job Creation in Sweden', Paper presented to the OECD High-level Workshop on SMEs: Employment, Innovation and Growth, Washington (DC), 1995.

Davidsson, P. (1995) 'Small Firms: Has their role as job creators been exaggerated?' Division of Entrepreneurship Jokling International Business School (JIBS), Sweden

Davidsson, P., Lindmark L., and Olofsson C. (1996) 'The extent of overestimation of small firm job creation - an empirical examination of the "regression" bias'. Small Business Economics Vol 11 August 1998 pp.87-100

Davis, J., Haltiwanger J., and Schuh, S. (1994) 'Small Business and Job Creation: Dissecting the Myths and Reassessing the Facts.' Business Economics, July, pp.13–21

Davis S., Haltiwanger. J., and Schuh. S. (1996) 'Small business and job creation: Dissecting the myth and reassessing the facts'. Small business economics. V8 n45 pp. 297-315

Dawkins, C. J., (2003) 'Regional Development Theory: Conceptual Foundations, Classic Works, and Recent Developments'. Journal of Planning Literature; 18; p.131

De Tocqueville, A. (1835) 'Democracy in America', Chapter 19 retrieved on 16.02.05 from website: http://xroads.virginia.edu/~HYPER/DETOC/ch2_19.htm

Department for Trade and Industry (2003) Press Release of the Automotive Unit, 4th December 2003 retrieved on 04.07.05 from website http://www.autoindustry.co.uk/news/press_releases/04-12-03_1

DiGiovanna, S., and Lewis, D.A. (1998) 'The Future of Technology Incubation in New Jersey: A Strategy for the New Jersey', Commission on Science and Technology. New Brunswick, NJ: Project on Regional and Industrial Economics, Rutgers University.

Dixon, R.J., and Thirlwall, A.P. (1975) 'A model of regional growth rate differences on Kaldorian lines'. Oxford Economic Papers 27, 2: pp.201-14

Doi, N., and Cowling, M. (1998) 'The Evolution of Firm Size and Employment Share Distribution in Japanese and UK Manufacturing: A Study of Small Business Presence'. Small Business Economics, 10, pp.283–92

Doloreux, D. (2002) 'What We Should Know About Regional Systems of Innovation'. Technology in Society 24, pp.243-263

Drucker, P. (1994) 'Innovation and Entrepreneurship', 2nd ed., Oxford: Butterworth-Heinemann.

Dunham, A.L. (1930) 'The Anglo-French Treaty of Commerce of 1860', Ann Arbor: University of Michigan Press

Dunkelberg, W.G., and Cooper, A.C. (1982) 'Patterns of small business growth', Academy of Management Proceedings pp.409-413

Dunne, T., Roberts, M.J., and Samuelson, L. (1989) 'Growth and Failure of U.S. Manufacturing Plants'. Quarterly Journal of Economics 104, pp.671-698

Edquist, C. (1997) 'Systems of Innovation Approaches - Their Emergence and Characteristics'. In C. Edquist (Ed.), Systems of Innovation: Technologies, Institutions and Organizations, pp 1-35. London and Washington: Pinter.
Eisinger, P., (1988) 'The Rise of the Entrepreneurial State', State and Local Economic Development Policy in the United States. Madison, WI: University of Wisconsin Press.
Eliasson, G. (1994) 'The Theory of the Firm and the Theory of Economic Growth', IUI No. 357, Industrins Utvecklingsinstitut, Stockholm
ENSR (1994) 'The European Observatory for SMEs', Second Annual Report, Zoetermeer: EIM Small Business Research Consultancy/European Network for SME Research
Ericson, R., and Pakes, A., (1995) 'Markov-Perfect Industry Dynamics: A Framework for Empirical Work', Review of Economic Studies, 62, pp.53-82
Etzioni, A. (1964) 'Modern Organisations', Prentice-Hall, Englewood Cliffs, NJ
EU Commission's Incubator Database http://www.cordis.lu/incubators/search.htm accessed on 11.06.05
European Commission (2003) 'EU Observatory of European SMEs in Europe' 2003, Report No. 7.
European BIC Network (2005) '2004 BIC Observatory – An overview of the BIC approach in its 20th year', 10 March 2005, retrieved on 12.07.05 from website: http://quality.ebn.be/Documents/2004%20BIC%20Observatory.pdf p. 22
European Business Innovation Centre Network (EBN) website: http://www.ebn.be/content/default.asp?PageID=1&MenuGroup=1&MenuNum=1
European Commission (1997) 'European Network for SME Research Fourth Annual Report', The European Observatory for SMEs, Brussels.
European Commision (1998) 'European Commission Activities in Favour of SMEs and the Craft Sector', page 5
European Commission (2001) Observatory of European SMEs retrieved on 22.11.04 from website: http://www.eim.nl/observatory_7_and_8/en/stats/2001/var2/1cou_size.html
European Commission (2003) Communication From The Commission To The Council And The European Parliament 'Thinking Small In An Enlarging Europe', page 2; Brussels, 21.1.2003, COM (2003) 26 Final; retrieved on 18.12.04 from European Commission website: http://ec.europa.eu/enterprise/enterprise_policy/sme-package/doc/com26_en.pdf
European Commission (2004) 'European Competitiveness Report 2004', Commission Staff Working Document SEC (2004) 1397, page 48
European Commission (2005) 'State aid: Commission endorses German aid scheme for tenants of technology centres and incubators', Press Release 2005, Reference: IP/05/536 retrieved on 03/05/2005 from website: http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/05/536
European Commission (1990) 'Best Practices in Incubator Infrastructure and Innovation Support' workshop in Helsinki European Commission OJ C186 – 51/52 dd. 27, July 1990

European Commission Directorate General Enterprise (2001) 'Innovative Small and Medium Sized Enterprises and the Creation of Employment - Executive Summary', INNO-STUDIES 99 – Lot 9, page 10 retrieved on 16.12.04 from website: http://www.ifgh.ac.at/de/Executive_summary.pdf and http://www.kmuforschung.ac.at/en/Projects/Lot9/lot9.htm

European Commission Directorate Generals SMIE database (2005) Europa retrieved on 11.06.05 from website: http://europa.eu.int/comm/enterprise/smie/overviewbytarget.cfm

European Commission Directorate-General for Regional Policy's 'External evaluation study of the BIC programme', cited in European Commission 'Guide to European Business Innovation Centres Factsheet 5' retrieved on 07.09.04 from website: http://europa.eu.int/comm/regional_policy/innovation/innovating/pdf/fiche_5_en.pdf

European Commission Enterprise Directorate General (2002) 'Benchmarking of Business Incubators' Final Report, 2002, Centre for Strategy & Evaluation Services retrieved on 15.03.05 from website: http://europa.eu.int/comm/enterprise/entrepreneurship/support_measures/incubators/benchmarking_bi_appendices_2002.pdf

Eurostat (2004) News Release STAT/04/145 3 December 2004 retrieved on 11.03.05 from website: http://66.249.93.104/search?q=cache:RyucmCA1HPkJ:europa.eu.int/rapid/pressReleasesAction.do%3Freference%3DSTAT/04/145%26format%3DPDF%26aged%3D0%26language%3DEN%26guiLanguage%3Den+STAT/04/145+3+December+2004&hl=en

Fagerberg, J. (2005) 'Innovation: A Guide to the Literature'. In Fagerberg, J., Mowery, D. C. & Nelson, R. R. (Eds.), 'The Oxford Handbook of Innovation': pp 1-26. Oxford: Oxford University Press.

Falkeström, A., Klofsten, M. & Larsson, M. (2000) 'En studie av det svenska inkubatorsystemet'. NUTEK, Linköpings Universitet cited in 'Spatial Aspects of the University Incubator' Strid, M., Birgersson, L., retrieved on 20.06.05 from website: www.fm.chalmers.se/uploaded/publikationer/Salfordpaper020410.doc.

Fay, C. R. (1934) 'Adam Smith, America, and the Doctrinal Defeat of the Mercantile System', Quarterly Journal of Economics 48, pp.304-16; Alfred F. Chalk, A.E., 1951,"Natural Law and the Rise of Economic Individualism in England," Journal of Political Economy 59, (August), pp.332-47

Feldman, M., and Audretsch, D. (1999) 'Science-Based Diversity, Specialization, Localized Competition and Innovation', European Economic Review, 43, pp.409-429.

Foelster, S. (2000) 'Do entrepreneurs create jobs?', Small Business Economics, 14(2), pp.137-148.

Forthergill, S., and Gudgin, G. (1982) 'Urban and Regional Employment Change in the United Kingdom', in Fotopoulos, G. and Spence, N., 1999, 'Spatial Variations in New Manufacturing Plant Openings: Some empirical evidence from Greece', Regional Studies, 33, page 3.

Freeman, C. (1987) 'Technology Policy and Economic Performance', London: Pinter.

Fritsch, M. (1997) 'New firms and regional employment change', Small Business Economics, 9(5), pp.437-448.

Fry, F.L. (1987) 'The Role of Incubators in Small Business Planning,' American Journal of Small Business 12 (1), pp.51–61.
Fumagelli, A. & Mussati, G. (1993) 'Italian Industrial Dynamics from the 1970s to the 1980s - Some Reflections on the Entrepreneurial Activity', Entrepreneurship and Regional Development, 5, pp.25-37
Galbraith, J. K. (1956) 'American Capitalism: The Concept of Countervailing Power', p.87 revised edition, Boston, MA: Houghton Mifflin.
Gallager C. C., and Stewart H. (1986) 'Jobs and the business life cycle in the UK'. Applied Economics v18.8. Aug pp.875-900
Gallagher C. C., Doyle. J. (1987) 'The size distribution, growth potential, and job generation contribution of UK firms'. 1982-84 v6.1. Int. Small Business J.
Gallagher C.C., Daly, M.J., Thomason, J.C. (1991) 'The growth of companies 1985-87 and their contribution to job generation', Int. J. of Small Business Economics (3), pp.269-286 (11);
Gallagher C.C., Robson G., and Daly M.J. (1991) 'Job creation 1987-89: The contribution of small and large firms'. Employment Gazette Nov. pp.589-596
Gallagher, C.C., and Miller, P. (1991) 'New fast-growing companies create jobs', Long Range Planning, vol. 24, no. 1, pp.96-101
Gallagher, C.C., and Henry Stewart (1986) 'Jobs and the Business Life-cycle in the U.K.', Applied Economics, 18, pp.875-900
Gellman Research Associates (1976) 'Indicators of International Trends in Technological Innovation', prepared for the National Science Foundation.
Gellman Research Associates (1982) 'The Relationship between Industrial Concentration, Firm Size, and Technological Innovation', prepared for the Office of Advocacy, U.S. Small Business Administration under award no. SBA-2633-OA-79.
Georgopolous, B.S. & Tannenbaum, A.S. (1957) 'The Study of Organizational Effectiveness', American Sociological Review, 22, pp.534-540
Gibb, A. (2000) 'SME policy, academic research and the growth of ignorance: mythical concepts, myths, assumptions, rituals and confusions', International Small Business Journal, 18(3): 13-35
Glaeser, E.L., Kallal, H.D., Scheinkman, J.A., and Shleifer, A. (1992) 'Growth in Cities', Journal of Political Economy 100, pp.1126-1152.
Glancey, K. S., and McQuaid, R. W. (2000) 'Entrepreneurial Economics', MacMillan Press Ltd
Global Forum on Business Incubation, 'Creating Conditions for Innovation', Press Conference, New Delhi, August 11, 2004.
Gold, B. (1976) 'Tracing gaps between expectations and results of technological innovations: The case of iron and steel'. Journal of Industrial Economics, 25, pp.1-28
Gomes-Casseres, B. (1997) 'Alliance strategies of small firms', Small Business Economics, 9, pp.33-44
Government of South Africa National Treasury Division: Corporate Services 'Access to Finance in South Africa -A Supply-Side Regulatory Review' Chapter 1 The Relative Importance Of SMEs In The South African Economy: An Analysis Of Issues And Quantification Of Magnitudes', page 27 retrieved on 15.07.04 from website http://www.treasury.gov.za/documents/sme/p25_56.pdf

Greenhut, M.L. (1956) 'Plant location in theory and in practice'. Chapel Hill: University of North Carolina Press.
Grossman, G.M., and Helpman, E. (1991) 'Innovation and Growth in the Global Economy', Cambridge, MA: MIT Press.
Guide Des Centres Européens D'entreprise Et D'innovation (Ceei), Fiche 4.c 'Recrutement du directeur d'un CEEI' http://europa.eu.int/comm/regional_policy/innovation/innovating/pdf/fiche4c.pdf
Hackett, S.M., and Dilts, D.M. (2004) 'A Systematic Review of Business Incubation Research', Journal of Technology Transfer, 29, pp.55–82
Hallberg, K.A. (2000) 'Market-Oriented Strategy for Small and Medium Scale Enterprises', IFC Discussion Paper 40, World Bank, Washington D.C. retrieved on 11.11.04 from website: http://ifcln1.ifc.org/ifcext/economics.nsf/AttachmentsByTitle/dp40/$FILE/dp40.pdf
Hamilton, A. (1791) 'Report on Manufactures Communicated to the House of Representatives', December 5, cited by Bartlett, B., 1997 in 'Freedom to Trade – Refuting the New Protectionism – The Truth about Trade in History' retrieved on 03.04.04 from website: http://www.freetrade.org/pubs/freetotrade/chap2.html
Hansen, T., Nohria, N, and Berger, J.A. (2000) 'The State of the Incubator Marketspace', June retrieved on 09.10.04 from website: http://www.timswandesign.com/portfolio/pdf/HBR%20Incubator%20Report.pdf
Harhoff, D., and Licht, G. (1996) 'Innovationsaktivitäten kleiner und mittlerer Unternehmen', Baden-Baden: Nomos Verlagsgesellschaft
Harrison, B. (1985) 'The tendency toward instability and inequality underlying the "revival" of the New England economy'. In 'Economic prospects for the Northeast', Harry Richardson and Joseph Turek, eds. Philadelphia: Temple University Press.
Harrison, B. (1995) 'What are the Questions?', Small business Economics 7, pp.357-363
Harrison, B. (1997) 'Lean and mean: Why large corporations will continue to dominate the global economy', second edition, New York, Guilford
Hart, M. and Hanvey, E. (1995) 'Job generation and new and small firms: some evidence from the late 1980s', Small Business Economics, 7, pp.97-109.
Hart, M., Gudgin, G., Scott, R., and Hanvey, E. (1998) 'Value for Money? The effectiveness of regionally based small firm development agencies' in Halkier, H., Danson, M., and Damborg, C.(eds.) 'Regional Development Agencies in Europe' Jessica Kingsley Publishers, London, pp.324-42
Hoover, E.M. (1937) 'Location theory and the shoe and leather industry'. Cambridge, MA: Harvard University Press. Chapter 6
Hopenhayn, H.A. (1992) 'Entry, Exit and Firm Dynamics in Long Run Equilibrium', Econometrica, 60, pp.1127-1150
Horst, T. (1972) 'Firm and industry determinants of the decision to invest abroad: an empirical study', The Review of Economics & Statistics, 54(3), pp.258-266.
Howells, J. (1999) 'Regional Systems of Innovation'. In D. Archibugi & J. Howells & J. Michie (Eds.), 'Innovation Policy in a Global Economy', pp.67-93. Cambridge: Cambridge University Press.

Howells, J.R.L. (2002) 'Tacit Knowledge, Innovation and Economic Geography', Urban Studies, 39(5-6): pp.871-884.
Department of Trade and Industry (2003) retrieved on 19.04.2005 from website: http://www.dti.gov.uk/ministers/speeches/sainsbury 101103.html
Small Business Service (2004) http://www.sbs.gov.uk/SBS_Gov_files/researchandstats/survival-jan-2004.pdf accessed on 14.12.04
Sunderland City Council retrieved on 14.05.05 from website: http://www.sunderland.gov.uk/Public/Editable/Themes/Business/Invest-in-Sunderland/automotive-manufacturing.asp
Hulsink, W., and Elfring, T., (2001) 'Much ado about nothing? The role and contribution of incubators in promoting entrepreneurship and fostering new companies' retrieved on 21.10.04 from website: http://www.tukkk.fi/pki/rentpapers/hulsink.pdf
Industry and Regional Development Branch, Ministry of Economic Development (2002) 'SMEs in New Zealand: Structure and Dynamics; June retrieved on 29.03.04 from website:http://www.actetsme.org/newz/nz2002.htm
Industry Canada (2005) Survey of Employment, May 2005, vol. 7, no.1
Industry Canada (Strategis) Small Business Policy Branch (2005a) Survey of Employment, Payrolls and Hours, Small Business Quarterly, Survey of Employment (May 2005, vol. 7, no.1 - Job Creation
Industry Canada (Strategis) Small Business Policy Branch (2005b) Survey of Employment, Payrolls and Hours, Small Business Quarterly (February 2005, vol. 6, no.4 - Job Creation)
Israel's Small and Medium Enterprise Authority (2005) retrieved on 19.07.05 from website: http://www.asakim.org.il/english.php
Isard, W. (1960) 'Methods of regional analysis: An introduction to regional science'. Cambridge, MA: MIT Press.
Jacobs, J. (1969) 'The Economy of Cities', New York: Vintage Books.
Jaffe, A (1989) 'The real effects of academic research', American Economic Review, 79: pp.957-70.
Jaffe, A, Trajtenberg, M., and Hendersen, R. (1993) 'Geographic localization of knowledge spillovers as evidenced by patent citations', Quarterly Journal of Economics, 108: pp.577-598.
Johnson, S. (2006) 'Non-financial support for SMEs: an evaluation of the market failure approach' retrieved on 24.05.05 from Leeds Metropolitan University website: http://www.leedsmet.ac.uk/lbs/pri/prinews/Oct06News/Steve-PolandPaper.pdf
Janssen, F. (1993) 'Determinants of SMEs' Employment Growth Relating to the characterisitics of the Manager, Université Catholique de Louvain Institut d'Administration et de Gestion, http://www.isys.ucl.ac.be/working_papers/documents/WP93Janssen.pdf accessed on 07.11.04
Japan Ministry of Economy, Trade and Industry (2004) 'White Paper on Small and Medium Enterprises in Japan 2004: The Limitless Potential of the Diversity of Small and Medium Enterprises', Chapter 1 SMEs as the seeds for the development and diversification of the economy and society retrieved on 12.04.05 from website:

http://www.chusho.meti.go.jp/hakusyo/h16/download/2004hakusho_eng.pdf

Japan Small and Medium Enterprise Corporation or JASMEC (Undated) cited in the 'White Paper on Small and Medium Enterprises in Japan 2004: The Limitless Potential of the Diversity of Small and Medium Enterprises', Chapter 1.

Japan's Ministry of Education, Culture, Sports, Science and Technology (2003) 'Measures Adopted for Promotion of Science and Technology' retrieved on 26.02.05 from website: http://wwwwp.mext.go.jp/hakusyo/book/hpag200301/hpag200301_2_099.html

Japan's Ministry of International Trade and Industry (1999) 'Law for facilitating the creation of New Business' retrieved on 26.02.05 from website: http://www.meti.go.jp/english/report/data/gIP1102e.html, page 1.

Jensen, M.C. (1993) 'The Modern Industrial Revolution, Exit, and the Failure of Internal Control Systems', Journal of Finance 68, pp.831-880.

Jessop, B., and Peck, J. (2001) 'Fast policy/local discipline', Mimeograph, Department of Sociology, University of Lancaster

Johnson, S. and Smallbone, D. (2003) 'Support for Minority Entrepreneurs in Europe: Specialist Agencies or Mainstream Provision?' Annual Review of Progress in Entrepreneurship, pp.235-250

Jovanovic, B. (1982) 'Selection and the evolution of industry', Econometrica, Econometric Society, 50(3): 649-670; and Jovanovic, B., 2001, 'New Technology and the Small Firm', Small Business Economics, 16(1), pp.53-55;

Jovanovic, B. (1993), 'The Diversification of Production', Brookings Papers: Microeconomics 1993, pp.197-235.

Jovanovic, B. (2001) 'New Technology and the Small Firm', Small Business Economics, 16(1), pp. 54-55.

Julien, P.A. (2000) 'Les P.M.E. à forte croissance: les facteurs explicatifs', Minutes of the Congrès de l'Association internationale de Management Stratégique, pp. 24-26 cited in Janssen, F., DATE Determinants of SMEs Employment Grwoth Relating to the Characteristics of the Manager, Université Catholique de Louvain, Institut d'Administration et de Gestion, page 2

Kacker, S. (2005) 'Overcoming Barriers to Innovation for Indian SMEs', Government of India, Ministry Small Scale Industries, New Delhi retrieved on 12.07.05 from website: http://www.annualmeeting2005.insme.org/documents/14.4.2005/presentation_stuti.doc

Kaldor, N. (1970) 'The case for regional policies', Scottish Journal of Political Economy 17, 3: pp.337-48

Keeble, D. and Walker S. (1994) 'New firms, small firms, and dead firms: spatial patterns and determinants in the United Kingdom', Regional Studies 28. pp. 411-426

Kennedy, P., (1987) 'The Rise and Fall of the Great Powers', New York: Random House, page 151.

Kirchhoff, B.A. (1977) 'Entrepreneurship' in Bygrave, W.D. 'The Portable MBA in Entrepreneurship', 2nd ed. New York: John Willey & Sons.

Kirchhoff, B., and Phillip, B. (1988) 'The Effect of Firm Formation and Growth on Job Creation in the United States', Journal of Business Venturing, 3, pp.261-272

Kirchhoff, B.A. (1994) 'Entrepreneurship and Dynamic Capitalism.' Westport, CT: Quorum Books.

Kirchhoff, B.A. (1996) 'Self-Employment and Dynamic Capitalism', Journal of Labour Research 17, pp.627-643.

Kirzner, I.M. (1997), 'Entrepreneurial Discovery and the Competitive Market Process: An Austrian Approach', Journal of Economic Literature 35, pp.60-85.

Kitson, M., and Solomou, S. (1990) 'Protectionism and Economic Revival: The British Inter-war Economy', Cambridge University Press.

Kleinknecht, A., Reijnen, J., and Verweij, J. (1990) 'Innovatie in de Nederlandse industrie en dienstverlening (Innovation in the Dutch industrial and service sector)', Foundation for Economic Research University of Amsterdam (SEO), Amsterdam.

Klepper, S. (1996) 'Entry, Exit, Growth, and Innovation over the Product Life Cycle', American Economic Review, 86(3), pp.562-583

Klomp, L., and Pronk, J.(1998) 'Kennis en Economie, onderzoek en innovatie in Nederland 1998 (Knowlegde and economy, research and innovation in the Netherlands 1998)', Central Statistics Bureau (CBS), Voorburg/Heerlen.

Knowles, L.C.A. (1926) 'The Industrial and Commercial Revolutions in Great Britain during the Nineteenth Century', 4th ed., New York, E. P. Dutton, p. 147.

Konings, J. (1995) 'Gross Job Flows and the Evolution of Size in U.K. Establishments', Small Business Economics, 7, pp.213-220.

Korean Small and Medium Business Administration (SMBA) (Undated) 'The status of Korean SMEs', retrieved on 05.04.05 from SMBA website: http://www.smba.go.kr/main/english/sub3/sub03_3_1.jsp

Korean Small and Medium Business Administration (SMBA) cited in Annual Competitiveness Report 1998: SME Performance: issued by the National Competitiveness Council http://www.forfas.ie/ncc/reports/ncc/sme.htm

Kraak, A. (2003) 'HRD and 'joined up' policy' in HSRC (ed.) Human Resources Development Review 2003, Cape Town: HSRC Press.

Kuratko, D.F., and LaFollette, W.R. (1987) 'Small Business Incubators for Local Economic Development', Economic Development Review 5 (2), pp.49–55.

Lalkaka, R. (1997), 'Lessons from International Experience for the Promotion of Business Incubation Systems in Emerging Economies', UNIDO, retrieved on 28.10.04 from website: http://www.unido.org/file-storage/download/?file_id=32890

Lalkaka, R. (2001) 'Best Practices in Business Incubation: Lesson Yet to be Learned', Business and Technology Development Strategies LLC, New York, Brussels, 14 November 2001 retrieved on 29.11.04 from website: http://www.bii.ge/eng/studies_&_Papers/LALKAKA_UK.pdf

Lalkaka, R. (2003) 'Technology Business Incubation: Role, Performance, Linkages, Trends', Isfahan Science & Technology Town, National Workshop on Technology Parks and Business Incubators Isfahan Iran, 20 - 21 May, 2003, page 7

Lambson, V.E. (1991) 'Industry Evolution with Sunk Costs and Uncertain Market Conditions', International Journal of Industrial Organization, 9, pp.171-196.

Landabaso, M., and Mouton, B. (2002) 'Towards a new regional innovation policy: 8 years of European experience through innovative actions' retrieved on 22.08.04 from website: http://temi.provincia.mi.it/economia/sviluppo/documenti/Landabaso.PDF

Langlois, R.N. (2003) 'The vanishing hand: the changing dynamics of industrial capitalism Industrial and Corporate Change', Vol 12 No 2, April.

Lavrow, M., and Sample, S., (2000) 'Business Incubation: Trend or Fad? Incubating the Start-up Company to the Venture Capital Stage: Theory and Practice', University of Ottawa retrieved on 21.08.04 from website: http://www.cata.ca/files/PDF/Resource_Centres/hightech/reports/studies/Incubation.pdf

Lee, J. (1995) 'Small Firms' Innovation in Two Technological Settings', Research Policy, 24, pp.391–401.

Leigh, N.G. (1994) 'Stemming middle class decline: The challenges to economic development planning'. NewBrunswick, NJ: Center for Urban Policy Research.

Leonard, J. (1986) 'On the Size Distribution of Employment and Establishments'. Working Paper no. 1951. National Bureau of Economic Research.

Leth-Sorensen, S. and Boegh-Nielsen, P. (1995) 'SMEs and Job Creation', Paper prepared for the OECD High-level Workshop on SMEs: Employment, Innovation and Growth, Washington (DC).

Lettmayr, C., Oberholzner, T., Parger, and T., Sheikh, S. (1997) 'Auswirkungen von innovativen Unternehmen auf die Beschäftigtensituation (The impact of innovative enterprises on employment)', Research report, Austrian Institute for Small Business Research (IfGH), Vienna, 1997 cited in Innovative Small and Medium Sized Enterprises and the Creation of Employment - Executive Summary (Vienna, October 2001) INNO-STUDIES 99 – Lot 9, Submitted by: Austrian Institute for Small Business Research (IfGH) and Instituto Vasco de Estudios e Investigación (IKEI), page 10

Liddle, J., and Corcoran, J. (1996) 'A Regeneration Regime in the North East of England? Inter-Agency Partnerships and the Case of Siemens U.K.', in Urban Regimes in Theory and Practice

Liikanen, E. (2003) 'Commission adopts a new definition of micro, small and medium sized enterprises in Europe', European Commission Press Release Brussels, 8 May 2003 IP/03/652 retrieved on 13.11.04 from European Commission website: http://europa.eu/rapid/pressReleasesAction.do?reference=IP/03/652&format=PDF&aged=1&language=EN&guiLanguage=en.on

Link, A.N., and Bozeman, B. (1991) 'Innovative Behavior in Small-Sized Firms', Small Business Economics, 3 (3), pp.179-184.

Little, I. (1987) 'Small Manufacturing Enterprises in Developing Countries', World Bank Economic Review 1, pp.203-235.

Local Government Association (2005) 'Managed Workspace and Business Incubators A Good Practice Guide for Local Authorities', retrieved on 08.04.05 from Local Government Association website http://www.lga.gov.uk/lga/economicregeneration/final.pdf

Logan, J.R., Bridges-Whaley, R., and Crowder, K. (1999) 'The character and consequences of growth machines: An assessment of twenty years of research. In The urban growth machine: Critical perspectives, two decades later', Jonas, A.E.G., and Wilson, D. eds. Albany: State University of New York Press.

Lord David Sainsbury of Turville, Parliamentary Under-Secretary of State for Science and Innovation UKBO conference at the Queen Elizabeth II Conference Centre, London on Monday, 10 November, 2003 http://www.dti.gov.uk/ministers/speeches/sainsbury101103.html accessed on 19.04.2005

Loveman, G., and Sengenberger, W. (1991) 'The re-emergence of small-scale production: an international perspective', Small Business Economiscs, 3(1): pp1-38

Lucas, R.E. (1988) 'On the mechanics of economic development', Journal of Monetary Economics 22, pp.3-42.

Lucas, R.E. Jr. (1993) 'Making a miracle', Econometrica 61 (2), pp.251-272;

Ludsteck, J., Steiner, V. (2000) 'Innovation and employment at the firm level – An empirical analysis using data from CIS II', Conference paper for the conference on "Innovation and Enterprise Creation: Statistics and Indicators", in Sophia Antipolis on 23. - 24. Nov. 2000, Sophia Antipolis, 2000

Luetkenhorst, W. (2004) 'Economic Development, the Role of SMEs and the Rationale for Donor Support Some Reflections on Recent Trends and Best Practices', SME Partnership Group Meeting - Keynote Presentation, Hanoi, 19 November, page 3.

Lumme, A. (1996) 'Potential for Growth: Employment Creation Effects of the Most Promising Technology-based Entrepreneurial Companies in Finland', in New Technology-based Firms in the 1990s, vol. 2. Edited by R. Oakey, London: Paul Chapman Publishing Ltd., 1996, pp.35–50.

Lumpkin, J.R. and Ireland, R.D. (1988) 'Screening Practices of New Business Incubators: The Evaluation of Critical Success Factors,' American Journal of Small Business 12 (4), pp.59–81.

Lundvall, B.A. (1992) Introduction. In B.Å. Lundvall (Ed.), National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning: 1-22. London: Pinter.

Lundvall, B.A. (1999) 'Technology policy in the learning economy'. In D. Archibugi & J. Howells & J. Michie (Eds.), Innovation Policy in a Global Economy: 19-34. Cambridge: Cambridge University Press.

Magarinos, C.A. & Sercovich, F.C. (2002) Gearing Up For a New Development Agenda, Vienna

Mansfield, E. (1984) 'Comment on Using Linked Patent and R&D Data to Measure Interindustry Technology Flows', in Griliches, Z. (ed.), R&D, Patents, and Productivity, Chicago, IL: University of Chicago Press, pp.462-464.

Markley, D.M. and McNamara, K.T. (1995) 'Economic and Fiscal Impacts of a Business Incubator', Economic Development Quarterly 9 (3), pp.273–278

Markusen, A. (1987) 'Profit Cycles, Oligopoly and Regional Development', Cambridge, MA: MIT Press.

Marshall, A. (1920) Principles of Economics, 8th Edn, Macmillan, London

Marshall, Alfred. [1890] (1961) 'Principles of economics: An introductory volume'. 9th ed. Reprint, London: Macmillan.
Marshall, M. (1987) 'Long Waves of Regional Development'. New York: St. Martins Press.
Maslow, A.H. (1970) 'Motivation and Personality', New York: Harper and Row.
Massey, D., Quintas, P., and Weld, D. (1992) 'High-Tech Fantasies: Science Parks in Society and Space'. London: Routledge.
Massey, D., and Meegan. R. (1982) 'The anatomy of job loss: The how, why, and where of employment decline'. London: Methuen
McGrath, S. (2005) (eds) 'Skills Development in Very Small and Micro Enterprises', compiled by the Research Programme on Human Resources Development, Human Sciences Research Council for the SA Department for Labour retrieved on 23.03.05 from website http://www.info.gov.za/gazette/otherdocs/2005/skillsdev.pdf
McKee, B. (1992) 'A boost for start-ups', Nations Business, August: page 41
McKinnon, S., and Hayhow, S. (1998) 'The State of the Business Incubation Industry'. Athens, OH: NBIA Publications
McMullan, W.E., and Vesper, K. (1987) 'New ventures and small business innovation for economic growth', R&D Management, 17, 1, pp.3-13
Meeder, R.A. (1993) 'Forging the incubator: How to design and implement a feasibility study for business incubation programs'. Ohio: National Business Incubation Association.
Meredith, J. (1987) 'The Strategic Advantages of New Manufacturing Technologies for Small Firms', Strategic Management Journal 8, pp.249-258
Ministry of Finance, Government of Egypt (2004) 'Enhancing competitiveness for SMEs in Egypt', November 2004, page 4, retrieved on 08.08.05 from website: http://www.sme.gov.eg/Papaer/Action_plan_final.pdf
Molotch, H. (1976) 'The city as growth machine: Toward a political economy of place'. American Journal of Sociology 82, 2: pp.309-32.
Mueller, D. (2001) 'Public choice after 50 years, Bruno Frey after 60', Kyklos, 54 (2-3): 343
Myrdal, G. (1957) 'Economic theory and underdeveloped regions'. London: Duckworth.
National Business Incubation Association, (2001) 'Best Practice in Action: Guidelines for Implementing First Class Business Incubation Programs', NBIA.
National Business Incubation Association (2002) 'State of the Incubation Industry 2002', NBIA
National Business Incubation Association (2004) 'The History of Business Incubation'http://www.nbia.org/resource_center/what_is/beginnings_of_inc/index.php accessed 28.08.05
National Business Incubation Association (Undated) 'Summary of the U.S. Incubator Industry', Athens, OH, cited in Hackett, S.M. and Dilts, D.M. (2004) 'A Systematic Review Of Business Incubation Research' Journal of Technology Transfer, 29, page 57, pub Kluwer Academic Publishers.
National Business Incubation Association http://www.nbia.org/

National Competitiveness Council [for Ireland] (1998) 'SME Performance: Annual Competitiveness Report 1998', page 2, issued by the National Competitiveness Council retrieved from http://www.forfas.ie/ncc/reports/ncc/sme.htm on 05.04.05
National Council for Urban Economic Development (1985) 'Creating Jobs by Creating New Businesses - The Role of Business Incubators', Washington, D.C. p.1
National Science Foundation (1985) 'Innovation and Enterprise: A Study of NSF's Innovation Centres Program', Washington DC.
Nelson, R. R. (1959) 'The Simple Economics of Basic Scientific Research', Journal of Political Economy, 67(2), pp.297-306.
Nelson, R. R. 1992. 'National Innovation Systems: A Retrospective of a Study'. Industrial and Corporate Change, 1(2): pp.347-374.
New and Renewable Energy Centre, www.narec.co.uk
Nilsson, J.E. et al. (2003) 'The Role of Universities in Regional Innovation Systems – A Nordic Perspective'. Oslo: Nordic Industrial Fund.
Niskanen, W. (1994) 'Bureaucracy and Public Economics', The Locke Institute.
North, Douglass C. (1955) 'Location theory and regional economic growth'. Journal of Political Economy 63, 3: pp.243-58.
North, Douglass C. (1956) 'Exports and regional economic growth: A reply'. Journal of Political Economy 64, 2: pp.165-68.
North, D., Smallbone, D., and Leight, R. (1994) 'Employment and labour process changes in small and medium sized manufacturing enterprises during the 1980s'. In: Atkinson, J., Storey, D. (Eds.), 'Employment, the Small Firm and the Labour Market', Routledge, London
North, D., Smallbone, D., Lyon, F. and Potts, G. (2003) 'Business-led regeneration of deprived areas', Research Report 5, Neighbourhood Renewal Unit and Small Business Service
Nyrop, K. (1986) 'Business incubators as real estate ventures'. Urban Land, 45(12), pp.6-10
O'Farrel, P.N. (1984) 'Small manufacturing firms in Ireland: employment performance and implications', International Small Business Journal, 2, 2, pp.48-61
Observatory of European SMEs (2003) 'SMEs in Europe 2003', No. 7
Ocampo, J.A. (2002) 'Rethinking the Development Agenda', Cambridge Journal of Economics, Vol.26
OECD (1995) 'Competition Policy in OECD Countries 1992-1993', Paris, pp.39-49.
OECD (1996) 'SMEs and Employment Creation: Overview of Selected Quantitative Studies in OECD Member Countries'; STI Working Papers 1996/4 page 14
OECD (1997) 'Globalization and Small and Medium Enterprises (SMEs)', vol. 1 (Synthesis Report) and vol. 2 (Country Studies), Paris.
OECD (1999) 'High growth firms and employment', Report prepared for the meeting in Helsinki of the working group on SMEs, 20-21 May, DSTI/IND/P.M.E.(99)6
OECD (1999) 'Business Incubation International Case Studies' Chapter 4 page 73 retrieved on 07.05.05 from website: http://cdnet.stic.gov.tw/ebooks/OECD/24.pdf

OECD (2004) 'The Istanbul Ministerial Declaration on Fostering the Growth of Innovative and Internationally Competitive SMEs' (3-5 June) retrieved on 10.10.04 from website: http://www.oecd.org/document/16/0,2340,en_2649_201185_32020176_1_1_1_1,00.html

Oughton, C., Landabaso, M., and Morgan, K. (2002) 'The Regional Innovation Paradox: Innovation Policy and Industrial Policy'. Journal of Technology Transfer, 27(2): pp.97-110.

Oughton, C. and Frenz, M. (2005) 'Innovation Policy Paper – A Report for the East Midlands Development Agency'; EMDA

Owen, G. (2004) 'Where are the big gorillas? High technology entrepreneurship in the UK and the role of public policy', Entrepreneurship and Public Policy Project, Diebold Institute for Public Policy Studies.

Pack, H., and Westphal, L. (1986) 'Industrial Strategy and Technological Change: Theory versus Reality', Journal of Development Economics 22, pp.87-128.

Pack, H. (1992) 'Learning and Productivity Change in Developing Countries, in Trade Policy, Industrialization and Development: New Perspectives', edited by Gerald K. Helleiner, pp. 21-45. Oxford: Clarendon Press.

Pagano, P., and Schivardi, F. (2001) 'Firm Size Distribution and Growth', Banca d'Italia Working Paper 394. http://digilander.libero.it/fschivardi/images/pagaschi5.pdf accessed on 12.11.03

Parker, R (2000) 'Small is not necessarily beautiful: an evaluation of policy support for small and medium-sized enterprises in Australia', Australian Journal of Political Science, 35(2), pp.239-253

Patent Office (1980) PL 96-517, Patent and Trademark Act Amendments of 1980

Pavitt, K., Robson, M., and Townsend, J. (1987) 'The Size Distribution of Innovative Firms in the UK: 1945–1983', Journal of Industrial Economics, 35, 3 pp.297–317.

Pearce, D. (1996) MacMillan Dictionary of Economics cited in Foundation for SME Development at the University of Durham (2002), 'A Study Of Business Support Services And Market Failure' European Commission page 4 retrieved on 01.05.05 from website: http://ec.europa.eu/enterprise/entrepreneurship/support_measures/failure_bankruptcy/business_support_services_and_market_failure.pdf accessed on

Peck, J. (2001) 'Neoliberalizing States: Thin Policies/Hard Outcomes' Progress in Human Geography 25, page 3

Peet, R., and Hartwick, E. (1999) 'Theories of development'. New York: Guilford Press.

Performance and Innovation Unit (2001) 'Briefing Paper By The Performance And Innovation Unit (PIU) And Small Business Service (SBS)', page 1, retrieved on 06.04.05 from the Cabinet Office website: http://www.cabinetoffice.gov.uk/strategy/downloads/seminars/small_business/briefing.pdf

Perloff, H. S., Dunn, E.S.(Jr), and Lampard, E.E., and Muth, R.F. (1960) 'Regions, resources, and economic growth'. Baltimore: Johns Hopkins University Press.

Perroux, F. (1950) 'Economic space: Theory and applications'. Quarterly Journal of Economics 64, 1: pp 89-104.

Petree, R., Petkov, R., & Spiro E. (1997) 'Technology Parks-Concept and Organisation', Summary Report prepared for Center for Economic Development, Sofia, accessed 24.08. 2002 at http://www.ced.bg/;
Technology Parks—Concept and Organization, Summary Report http://www.techpark.ir/Parks/English/Articles/Organization.htm accessed on 08.05.05
Picot, G., Baldwin, J.R., and Dupuy, R. (1994) 'Have Small Firms Created a Disproportionate Share of New Jobs in Canada? A Reassessment of the Facts.' Paper presented at the Canadian Economics Association Meeting, Calgary, June 1994
Piore, M.J., and Sabel, C.F. (1984) 'The Second Industrial Divide; Possibilities for Prosperity', Basic Books NY
Plosila, W., and Allen, D.N. (1985) 'Small Business Incubators and Public Policy: Implications for States and Local Development Strategies,' Policy Studies Journal 13, pp.729–734
Porter, M. (1990) 'The Comparative Advantage of Nations', New York: Free Press.
Porter, M. (1995) 'The Competitive Advantage of the Inner City', Harvard Business Review, 73(3), pp.55-72
Porter, M. (2000) 'Locations, Clusters, Company Strategy'. In: Clark G. L., Feldman M. P. & Gertler M. S. (eds.) (2000) 'The Oxford Handbook of Economic Geography'. Oxford: Oxford University Press, pp.253-274.
Postrel,V.I. (1994) 'Populist Industrial Policy', page 1, in Reason Online retrieved from http://reason.com/9401/ed.vp.9401.shtml on 17.03.05
Potočnik, J. (2005) 'The importance of SMEs in the European Knowledge economy' (Celje, Slovenia, 18 March 2005) retrieved on 20.07.05 from European Commission website: http://ec.europa.eu/commission_barroso/potocnik/news/docs/20050318_speech_celje.pdf
Pratten, C.E. (1971) 'Economies of Scale in Manufacturing Industry'. Cambridge: Cambridge University Press.
Prusa, T.J. and Schmitz, J.A. (1991) 'Are New Firms an Important Source of Innovation? Evidence from the Software Industry', Economics Letters 35, pp.339-342.
Republic of Turkey Ministry of Industry and Trade, Small and Medium Industry Development Organization (undated) 'Description and Establishment Purpose', retrieved on 06.06.05 fro website: http://www.kosgeb.gov.tr/KOSGEB/Index.asp
Reynolds, R.D. (1999) 'Creative destruction: source or symptom of economic growth?' in Acs, Z.J., Carlsson, B., and Karlsson, C., (eds) 'Entrepreneurship Small and Medium-Sized Entrepreneurship and Macroeconomy' pp.97-136. Cambridge: Cambridge University Press
Reynolds, R. D., Hay, M., Bygrave, W.D., Camp, S. M., and Autio, E. (2000) Global Entrepreneurship Monitor, Kaufman Center for Entrepreneurial Leadership, Kansas City.
Rice, M.P., and Matthews, J. (1995) 'Growing New Ventures, Creating New Jobs: Principles and Practices of Successful Business Incubation', Quorum Books

Rice, M.P. (2002) 'Co-production of Business Assistance in Business Incubators: An Exploratory Study', Journal of Business Venturing 17, pp.163–187.
Romer, P.M. (1986) 'Increasing Returns and Long-Run Growth, Journal of Political Economy', 94(5), October, pp.1002-37.
Romer, P.M. (1990) 'Endogenous technological change', Journal of Political Economy 98, pp.71-101.
Romer, P.M. (1994) 'The origins of endogenous growth', Journal of Economic Perspectives 8 (1), pp.3-22.
Rothwell R, and Zegveld, W. (1982) 'Innovation and the Small and Medium Sized Firm'. Pinter Publishers, London
Rothwell, R. (1983) 'Innovation and Firm Size: A Case for Dynamic Complementarity; Or, Is Small Really So Beautiful?' Journal of General Management 8, pp.5-25.
Rothwell, R. (1984) 'The Role of Small Firms in the Emergence of New Technologies', OMEGA 12, pp.19-29.
Rothwell, R. (1988) 'Small Firms, Innovation and Industrial Change'. Small Business Economics, 1, 1, pp.51–64.
Rozenweig, Mark R. (1988) 'Labour Markets in Low-Income Countries', Handbook of Development Economics, Vol. 1, edited by Hollis B. Chenery, T. and. Srinivasan, N. Amsterdam cited in Beck, T., 'Small and Medium Enterprises, Growth, and Poverty: Cross-Country Evidence', World Bank Policy Research Working Paper 3178, December 2003 page 2
SA Department for Labour (2005) 'Skills Development in Very Small and Micro Enterprises' (ed. McGrath, S. and compiled by the Research Programme on Human Resources Development), Human Sciences Research Council, page 13.
Sakakibara, E. (2001) 'Commanding Heights', retrieved on 30.10.04 from website http://www.pbs.org/wgbh/commandingheights/shared/minitextlo/int_eisuke sakakibara.html
Santarelli, E. and Sterlachinni, A. (1990) 'Innovation, Formal vs. Informal R&D, and Firm Size: Some Evidence from Italian Manufacturing Firms', Small Business Economics, 2(2), pp.223-228; Santarelli, E. and Sterlacchini, A. 1994: New firm formation in Italian industry 1985-1989, Small Business Economics, 6(2), pp 95-106.
Saxenian, A.L. (1996) 'Inside-Out: Regional Networks and Industrial Adaptation in Silicon Valley and Route 128'. Cityscape: A Journal of Policy Development and Research, 2(2): pp.41-60
Scheirer, M.A. (1985) 'Innovation and Enterprise: A Study of NSF's Innovation Centres Program', Rockville, MD: Westat, Inc. and National Science Foundation.
Scherer, F.M. (1983) 'The Propensity to Patent', International Journal of Industrial Organization, 1, pp.107-128
Scherer, F.M. (1988) Testimony before the Subcommittee on Monopolies and Commercial Law, Committee on the Judiciary, U.S. House of Representatives, February 24; and Scherer, F. M., 1991, 'Changing Perspectives on the Firm Size Problem', in Acs, Z.J. and Audretsch, D.B. (eds.), Innovation and Technological Change: An International Comparison, Ann Arbor: University of Michigan Press, pp. 24-38.
Schiller, B.R. and Crewson, P.E. (1997) 'Entrepreneurial Origins: A Longitudinal Inquiry', Economic Inquiry 35, pp.523-531

Schreyer, P. (1996) 'SMEs and Employment Creation: Overview of Selected Quantitative Studies in OECD Member Countries'. Paris: OECD.
Schumpeter, J.A. (1934) 'The Theory of Economic Development'. Cambridge, MA: Harvard University Press.
Schumpeter, J.A. (1942) 'Capitalism, Socialism And Democracy', New York, NY: Harper and Row. Page 106
Schwalbach, J. and Zimmermann, K.F. (1991) 'A Poisson Model of Patenting and Firm Structure in Germany', in Acs, Z.J. and Audretsch, D.B., eds., 'Innovation and Technological Change: An International Comparison', Ann Arbor: University of Michigan Press, pp.109-120
Science Park and Innovation Center Experts http://www.spicegroup.de/
Wong Kan (2004) 'Realising the SME vision: What Matters Most' Speech by at the opening ceremony of Singapore Chinese Chamber of Commerce & Industry (SCCCI) 6th annual sme conference – Thursday July 15 2004, at 9.30 am, http://english.sccci.org.sg/index.cfm?GPID=505 accessed 07.04.05
Servan-Schreiber, J.J. (1968) 'The American Challenge'. London: Hamish Hamilton
Shahidi, H. (1998) 'The Impact of Business Incubators on Entrepreneurial Networking: A Comparative Study of Small, High-Technology Firms'. George Mason University.
Sherman, H. (1999) 'Assessing the Intervention Effectiveness of Business Incubation Programs on New Business Start-ups', Journal of Developmental Entrepreneurship 4 (2), pp.117–133.
Singapore Ministry for Home Affairs (2004) 'Realising the SME Vision: What Matters Most', page 1, retrieved on 15.08.04 from Ministry for Home Affairs website: w2.mha.gov.sg/mha/detailed.jsp?artid=1109&type=4&root=0&parent=0&cat=0&mode=arc
Small and Medium Enterprise Development Authority of Pakistan (2005) page 1 retrieved from http://www.smeda.org.pk/main.php?id=34 accessed on 06.06.05
Small Business Service (2004) 'Analysis and Statistics, Survival Rates of VAT registered businesses 1993-2004', Table 1, page 5
Small Business Service (2005) Employment data; GDP, 2005, EUROSTAT news release 7 April 2005 wherein EU 100 calculated with reference to EU 25 average
Smallbone, D. and Venesaar, U. (1997) 'The Contribution of SMEs to the Process of Transforming a Centrally Planned Into a Market Economy: The Case of Estonia' http://www.usasbe.org/knowledge/proceedings/1997/P149Smallbone.PDF accessed 09.05.05
Smilor, R.W., and Gill, M.D. (1986) 'The New Business Incubator: Linking Talent, Technology, Capital and Know-How', Lexington Books, D.C. Heath and Company/Lexington, Massachussetts/Toronto cited in Mian, S. A., (1996) 'The university business incubator: A strategy for developing new research/technology-based firms', Journal of High Technology Management Research, fall96, vol. 7 Issue 2, p191.

Smilor, R.W., and Gill, M.D. (1986) 'The New Business Incubator: Linking Talent, Technology, Capital, and Know-How'. Lexington, MA: Lexington Books.
Smilor, R.W. (1987) 'Managing the Incubator System: Critical Success Factors to Accelerate New Company Development', IEEE Transactions on Engineering Management EM-34 (4), pp.146–156
Stiglitz, J.E. (1998) 'More Instruments and Broader Goals: Moving towards the Post-Washington Consensus', WIDER Annual Lectures 2, January.
Storey, D.J. and Johnson, S.G. (1987) 'Job creation in small and medium sized firms', Vol. 1, Luxembourg, Office for the Official Publications of the European Community
Storey, D. and Johnson, S. (1987) 'Job Generation and Labour Market Change', MacMillan, Basingstoke
Storey, D.J., Keasey, K., Watson, R., Wynarczyk, P. (1987) 'The Performance of Small Firms, Profits, Jobs, and Failures'. Croom Helm, London.
Storey D (1993) 'Should we abandon support to start-up businesses?', in Chittenden, F., Robertson, M. and Watkins, D. (eds) 'Small Firms: Recession and Recovery', Paul Chapman Publishing
Storey, D.J. (1994) 'Understanding the small business sector'. Routledge. London.
Storey, D.J. (1995) 'A Job Generation perspective', Small Business Economics 7 pp.337-340
Storey, D.J., Tether, B.S. (1998) 'Smaller firms and Europe´s high technology sectors: A framework for analysis and some statistical evidence', in: Research Policy 26, pp. 947 -971
Szabo, A. (2003) 'The Development Of The SME Sector In The Various Regions Of The OSCE', 3rd OSCE Parliamentary Assembly Conference on Sub-Regional Co-operation: Small and Medium-Sized Businesses retrieved on 10.02.05 from website: http://www.unece.org/indust/sme/osce-sme.html
Taussig, F.W. (1931) 'The Tariff History of the United States', 8th ed. (New York: G. P. Putnam's Sons, pp. 61-63.
Teece, D.J. (1993) 'The dynamics of industrial capitalism: perspectives on Alfred Chandler's "Scale and Scope"', Journal of Economic Literature 31, pp.199-225
Temali, M., and Campbell, C. (1984) 'Business Incubator Profiles: A National Survey', Minneapolis: University of Minnesota, Hubert H. Humphrey Institute of Public Affairs.
Tether, B.S. (2000) 'Small Firms, innovation and employment creation in Britain and Europe: A question of expectations', Tecnovation 20, pp. 109 – 113 and cited in a report by the Austrian Institute for Small Business Research (ifGH) and Instituto Vasco de Estudios e Investigacion (IKEI) 'Innovative Small and Medium Sized Enterprises and the Creation of Employment' Vienna, October 2001 (Inno-Studies 99 – Lot 9 European Commission Enterprise Directorate-General)
The State of Small Business: A Report of the [US] President (1996), which describes how in extremely innovative industries in 1982 (computer equipment and electronic components, etc.), SMEs created approximately the same proportion of technological innovation as large enterprises.
The White House, Policies in Focus 'The President's Small Business Agenda' http://www.whitehouse.gov/infocus/smallbusiness/agenda.html, accessed on 13.05.05

Thomas, J. A. (1929) 'The Repeal of the Corn Laws', 1846, Economica 9 (April) pp.53-60
Thompson, J.D. (1967) 'Organizations in Action', McGraw Hill, New York; Pennings, J.M. & Goodman, P.S. (1977), Toward a Workable Framework in New Perspectives on Organizational Effectiveness, eds, Jossey-Bass, San Francisco, CA, pp.146-184
Thurik, A.R. (1995) 'Small Firms, Entrepreneurship and Economic Growth', Tinbergen Institute Discussion Paper TI 95-52, Tinbergen Institute
Thurik, R. (1999) 'Entrepreneurship, industrial transformation and growth', in Liebcap, G.D., (ed.) The Sources of Entrepreneurial Activity, pp. 29-66. Stamford, CT: JAI Press.
Tiebout, C.M., (1956a) 'Exports and regional economic growth', Journal of Political Economy 64, 2: pp.160-64.
Tiebout, C.M. (1956b) 'Exports and regional economic growth: Rejoinder', Journal of Political Economy 64, 2: page 169
Tornatzky, L., Batts, Y., McCrea, N., Lewis, M., and Quittman, L. (1996) 'The Art and Craft of Technology Business Incubation: Best Practices and Tools from 50 Programs', Research Triangle, NC: Southern Technology Council.
Trade Union Congress (2005) 'Economic report: Small firms - myths and realities', http://www.tuc.org.uk/em_research/tuc-6012-f0.cfm accessed on 06.06.05
Traù, F. (2002) 'The Rise and Fall of the Size of Firms', ESRC Centre for Business Research, University of Cambridge, working paper 156, (March) cited in 'The path to prosperity: Canada's small- and medium-sized enterprises' - A study sponsored by Canadian Federation of Independent Business Canadian Manufacturers & Exporters RBC Financial Group (October 2002) http://www.rbc.com/newsroom/pdf/20021007CanadaSME.pdf accessed on 12.07.05
U. S. Small Business Administration (1998) 'The State of Small Business: A Report of the President', page 1; retrieved on 20.11.04 from US SBA website: http://www.sba.gov/ADVO/stats/state_syn98.txt
U. S. Small Business Administration (2005) 'The President's Small Business Agenda', 2005, page 1 retrieved on 21.07.05 from US SBA website: http://www.whitehouse.gov/infocus/smallbusiness/agenda.html
U. S. Small Business Administration Office of Economic Research, Office of Advocacy, (1998) 'The New American Evolution: the role and impact of small firms – White Paper', Washington D. C. page 2, retrieved on 20.11.04 from website: http://home.ubalt.edu/zacs/whitepaper.pdf
U.S. Small Business Administration (2004) 'Handbook of Small Business Data', 1994 edition
Udell, G. (1990) 'Are Business Incubators Really Creating New Jobs by Creating New Businesses and New Products', Journal of Product Innovation Management 7, pp.108-122.
UK Business Incubation (2001) 'UK Incubation Impact Assessment Study (1999/2000)'
UK Business Incubation (2004) 'National Business Incubation Framework Summary Report, Appendix' (p.4) retrieved on 16.01.05 from website: http://www.ukbi.co.uk/docs/Benchmarking%20Summary%20Report%20Appendix.pdf

UK Business Incubation (2005) http://www.ukbi.co.uk/?sid=133&pgid=134 accessed 20.08.05

UNCTAD (2004) 'Palestinian SMEs: Dynamics and Contribution to Development' Report number UNCTAD/GDS/APP/2004/1 retrieved on 29.03.04 from website: http://www.unctad.org/en/docs/gdsapp20041_en.pdf

UNECE (1999) 'Polish Experience in Building Up SME Support', A paper presented at the Round Table on "The Polish Experience of Transition: Accomplishment and Problems" held on 7 June 1999 at the Palais des Nations in Geneva. http://www.unece.org/indust/sme/poland.htm accessed 05.05.05

UNECE (1999) 'UN-ECE Operational Activities: Promoting And Sustaining Business Incubators For The Development OF SMEs', United Nations Economic Commission for Europe, 1999, Discussion Paper [para 18] prepared for the Expert Meeting on Best Practice in Business Incubation held on 3-4 June 1999 at the Palais des Nations in Geneva OPA/AC.9/4 (25 May)

UNECE (2001) 'Best Practice in Business Incubation', ECE/TRADE/265 Sales No. E.01.II.E.9, ISBN 92-1-116777-9 pp.51-52

UNECE (2003) 'Small and Medium-sized Enterprises in Countries in Transition'. Biennium Review 2000-2001, UNECE, OPA/AC.32/1, 2003 retrieved on 16.12.04 from website: http://www.unece.org/indust/sme/osce-sme.html

UNECE (2003) 'The Development Of The SME Sector In The Various Regions Of The OSCE', Paper prepared by Dr. Antal Szabo, Regional Adviser on Entrepreneurship and SMEs, UNECE for the 3rd OSCE Parliamentary Assembly Conference on Sub-Regional Co-operation: Small and Medium-Sized Businesses held on 14-15 May 2003 in the Swiss Parliament in Bern retrieved on 29.09.04 from website: http://www.unece.org/indust/sme/osce-sme.html

UNIDO (2004) 'Industrialization, Environment and the Millennium Development Goals. The New Frontier in the Fight Against Poverty' (Industrial Development Report 2004), Vienna 2004

United Kingdom Business Incubation (UKBI) http://www.ukbi.co.uk/

United Kingdom Science Park Association (UKSPA) http://www.ukspa.org.uk/

University Grants Commission of India (Apex Body of the Government of India) http://www.ugc.ac.in/new_initiatives/kbe.html accessed on 14.08.05

US Office of Technology http://www.sba.gov/sbir/indexsbir-sttr.html accessed on 14.08.05

US Small Business Administration, http://www.sba.gov/sbir/indexsbir-sttr.html accessed on 14.08.05

US Small Business Administration, 'Overview & History of the SBA', http://www.sba.gov/aboutsba/history.html accessed on 13.08.05

Verheul, I., Wennekers, S. Audretsch, D.B., and Thurik, A.R. (2001) 'An Eclectic Theory of Entrepreneurship', Tinbergen Institute Discussion Paper 2001-030/3, Tinbergen Institute retrieved on 21.01.05 from website: http://www.tinbergen.nl/discussionpapers/01030.pdf

Vernon, R. (1970) 'Organization as a scale factor in the growth of firms', in Markham, J.W., and Papanek, G.F. (eds) 'Industrial Organization and Economic Development', pp. 47-66. Boston, MA: Houghton Mifflin.

Vosloo,W.B. (ed) (1994) 'Entrepreneurship and Economic Growth', HSRC Publishers, Pretoria
Wacquant, L. (1999) 'How penal common sense comes to Europeans: Notes on the transatlantic diffusion of the neoliberal doxa', European Societies 1, pp.319-352
Wagner, J. (1995) 'Exports, Firm Size and Firm Dynamics', Small Business Economics, 7, pp. 29–39.
Weber, A. (1929) 'Theory of the Location of Industry', Chicago: University of Chicago Press
Weinberg, M.L., Lyons, T. S., and Shook, M. (1995) 'State government support of business incubators', Economic Development Commentary, 19(2), 19, pp.17-21.
Weiss, L.W. (1964) 'The survival technique and the extent of sub-optimal capacity', Journal of Political Economy, 72(3), pp.246-261
Weiss, L.W. (1976) 'Optimal plant scale and the extent of suboptimal capacity', in. Masson, R.T., and. Quails, P.D.(eds) 'Essays on Industrial Organization in Honor of Joe S. Bain'. Cambridge, MA: Ballinger. Copyright Journal of Industry Studies Sep 2004, page 259
Whyte, W.H. (1956) 'The Organization Man', Garden City, NY: Doubleday
Wickenheiser, M. (2005) SundayBudget cuts clouding outlook for incubators, Portland Press Herald, February 27, 2005, retrieved on 09.06.05 from website: http://business.mainetoday.com/news/050227incubators.shtml
Wilcock, D. (1999) 'A Study of Business Incubator Service Provision and Performance', MBA Dissertation, Imperial College cited in The UK Incubation Impact Study 1999/2000 Hannon, P.D. and Chaplin, P. UKBI
Williams, A.J. (1989) 'The Role of Small Enterprises in Job Generation in Australia: A Longitudinal Study from 1973', Frontiers in Entrepreneurship Research, Proceedings of the Ninth Annual Babson College Entrepreneurship Research Conference, 1989, pp. 17–33.
Williamson, Jeffrey G. (1965) 'Regional inequality and the process of national development: A description of the patterns', Economic Development and Cultural Change 13, 4: pp.158-200.
Wolman, H. (1996) 'The politics of local economic development'. Economic Development Quarterly 10, 2: pp.115-50.

Appendix 1

SECTION 1

GENERAL

Name of Respondent:	
Company Name:	
Postcode:	
WWW Site:	

ABOUT THE BUSINESS:
These questions are asked to establish baseline data for the sample and to ensure that the sample is representative

QUESTION 1.1
When was the firm founded: ☐☐☐☐ Year

QUESTION 1.2
Which term(s) best describes your business/apply to your business?:

For Profit? ☐ **OR** Not for profit? ☐

Industrial e.g. Manufacturing, construction, engineering)? ☐ Services? ☐
Charitable? ☐ Social Enterprise? ☐
Quasi-Public Enterprise ☐ Public Enterprise ☐
A business with subsidiary businesses i.e. a Holding Company ☐ Subsidiary ☐

QUESTION 1.3
What best describes your business:
Subcontractor (you supply goods and services to other businesses who use your input as part of the product or service they provide to their customer) ☐
OR
Principal Contractor (you undertake work in your own right and name) ☐

QUESTION 1.4
In percentage terms how much of your customer base is....

Private Sector Businesses?

0-5%	6-10%	11-20%	21-30%	31-40%	41-50%	51-60%	61-70%	71-80%	81-90%	91-100%
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Public Sector Organisations?

0-5%	6-10%	11-20%	21-30%	31-40%	41-50%	51-60%	61-70%	71-80%	81-90%	91-100%
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Private Consumers?

0-5%	6-10%	11-20%	21-30%	31-40%	41-50%	51-60%	61-70%	71-80%	81-90%	91-100%
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

QUESTION 1.5
In percentage terms how much of your customer base is

Global/International (outside the UK)

0-5%	6-10%	11-20%	21-30%	31-40%	41-50%	51-60%	61-70%	71-80%	81-90%	91-100%
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

National (within the UK)

0-5%	6-10%	11-20%	21-30%	31-40%	41-50%	51-60%	61-70%	71-80%	81-90%	91-100%
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Regional (in the North East)

0-5%	6-10%	11-20%	21-30%	31-40%	41-50%	51-60%	61-70%	71-80%	81-90%	91-100%
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

SECTION 2

The following questions are concerned with the nature and level(s) of innovation as they may occur in your business which we categorise (for the purposes of this research) as follows:

- **Product or Service Innovations** (new or significantly improved products or services)
- **Process Innovations** i.e. technologically new processes employed in the production of products or services)
- **Organisational or administrative innovations**

  Example: Changes in the structure of the organisation, business culture, goals, rules, roles, procedures, and structures etc i.e. the people side of the business

  Example: New pay and reward scheme, New bonus or incentive scheme, Investors in People Accreditation, Introduction of a new Quality System, Extranet, Intranet

Considering Product Innovations....

QUESTION 2.1:
In the last two years has your business introduced any new or significantly improved products or services which were:

Tick as appropriate

New to your firm ☐ New to your market ☐ New to your Industry ☐

IF ANSWER NO - GOTO QUESTION 3

IF YES...

QUESTION 2.2

Were these products or services developed...? **May tick more than one box*

In-house	☐
By other businesses or institutions and then rolled out by your business	☐
In co-operation with other businesses	☐
In consultation with suppliers (equipment, materials, components or software)	☐
In consultation with clients or customers	☐
In co-operation with other institutions (e.g. Universities, Research Centres)	☐
With the assistance of Business Support Agency staff (e.g. as part of a business support programme or public sector business advisors/consultants)	☐
With financial assistance form European, National or Regional Research Grants or Awards	☐

QUESTION 2.3

Thinking of product innovations in your business, would you describe them as...?

Constant and ongoing (i.e. one or multiple projects in development); OR	☐
Regular (but not a constant); OR	☐
Occasional; OR	☐
Rare	☐

Tick one box

QUESTION 2.4

How much of your turnover would you estimate is now attributable to...

Products that have remained largely unchanged or have only been marginally modified in the last two years? *Tick one box*

0-5%	6-10%	11-20%	21-30%	31-40%	41-50%	51-60%	61-70%	71-80%	81-90%	91-100%
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Products significantly improved in the last two years? *Tick one box*

0-5%	6-10%	11-20%	21-30%	31-40%	41-50%	51-60%	61-70%	71-80%	81-90%	91-100%
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Products new to your firm introduced in the last two years? *Tick one box*

0-5%	6-10%	11-20%	21-30%	31-40%	41-50%	51-60%	61-70%	71-80%	81-90%	91-100%
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Question 2.4
Thinking about the effects of the product innovations in your businesses

Would you say product innovation has made a 'Very Significant', 'Significant', 'Not particularly significant' or 'Insignificant' contribution to extending your range of goods or services. *Tick one box*

Very Significant	Significant	Not particularly significant	Insignificant
☐	☐	☐	☐

Would you say product innovation has made a 'Very Significant', 'Significant', 'Not particularly significant' or 'Insignificant' contribution to opening new markets or increasing your market share *Tick one box*

Very Significant	Significant	Not particularly significant	Insignificant
☐	☐	☐	☐

Would you say product innovation has made a 'Very Significant', 'Significant', 'Not particularly significant' or 'Insignificant' contribution to generally improving the quality of goods or services *Tick one box*

Very Significant	Significant	Not particularly significant	Insignificant
☐	☐	☐	☐

Considering Process Innovations....

QUESTION 3.1
In the last two years did your business introduce any technologically new or significantly improved processes for producing (goods or services) that were

New to your firm ☐ New to your market ☐ New to your Industry ☐

IF ANS NO GOTO 4

IF YES GOTO 3.2 overleaf

QUESTION 3.2
Were these PROCESSES developed... **May tick more than one box*

In-house	☐
By other businesses or institutions and then rolled out by your business	☐
In co-operation with other businesses	☐
In consultation with suppliers (equipment, materials, components or software)	☐
In consultation with clients or customers	☐
In co-operation with other institutions (e.g. Universities, Research Centres)	☐
With the assistance of Business Support Agency staff (e.g. as part of a business support programme or public sector business advisors/consultants)	☐
With financial assistance form European, National or Regional Research Grants or Awards	☐

QUESTION 3.3
Thinking of process innovations in your business, are they ...

Constant and ongoing (i.e. one or multiple projects in development); OR	☐
Regular (but not a constant); OR	☐
Occasional; OR	☐
Rare	☐

Tick one box

Question 3.4
How much of your turnover would you estimate (in percentage terms) is attributable to:

Processes that have largely remained unchanged or have been only marginally modified in the last two years *Tick one box*

0-5%	6-10%	11-20%	21-30%	31-40%	41-50%	51-60%	61-70%	71-80%	81-90%	91-100%
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Processes significantly improved in the last two years *Tick one box*

0-5%	6-10%	11-20%	21-30%	31-40%	41-50%	51-60%	61-70%	71-80%	81-90%	91-100%
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Processes New to your Firm in the last two years *Tick one box*

0-5%	6-10%	11-20%	21-30%	31-40%	41-50%	51-60%	61-70%	71-80%	81-90%	91-100%
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Question 3.5
Thinking about the effects of the process innovations you have reported above...

Would you say process innovations have made a 'Very Significant', 'Significant', 'Not very significant' or 'Insignificant' contribution to reducing materials costs and/or energy per produced unit

Very Significant	Significant	Not particularly significant	Insignificant
☐	☐	☐	☐

Would you say process innovations have made a 'Very Significant', 'Significant', 'Not very significant' or 'Insignificant' contribution to improved production flexibility

Very Significant	Significant	Not particularly significant	Insignificant
☐	☐	☐	☐

Would you say process innovations have made a 'Very Significant', 'Significant', 'Not very significant' or 'Insignificant' contribution to reducing labour costs

Very Significant	Significant	Not particularly significant	Insignificant
☐	☐	☐	☐

Would you say process innovations have made a 'Very Significant', 'Significant', 'Not very significant' or 'Insignificant' contribution to increasing capacity

Very Significant	Significant	Not particularly significant	Insignificant
☐	☐	☐	☐

Considering Administrative or Organisational Innovations

Examples would include
New pay and reward scheme, New bonus or incentive scheme, New share option scheme, Investors in People Accreditation, Introduction of a new Quality System, Introduction of new technologies (Extranet, Intranet), Home working, New Training Programme or arrangements for Continuous Professional Development

QUESTION 4.1: Administrative Innovations
In the last two years have you made any significant changes in the structure of the organisation, business culture, goals, rules, roles, procedures, and structures etc i.e. the people side of the business?

YES ☐ **NO** ☐

IF NO GOTO QUESTION 5

IF YES

QUESTION 4.1.1
Were these changes in practice or procedures:
Tick as appropriate

New to your firm ☐ New to your Industry ☐

Question 4.2
Were these changes e.g. to structure or systems made:

In-house	☐
By other businesses or institutions and then rolled out by your business	☐
In co-operation with other businesses	☐
In consultation with suppliers (equipment, materials, components or software)	☐
In consultation with clients or customers	☐
In co-operation with other institutions (e.g. Universities, Research Centres)	☐
With the assistance of Business Support Agency staff (e.g. as part of a business support programme or public sector business advisors/consultants)	☐
With financial assistance form European, National or Regional Research Grants or Awards	☐

QUESTION 4.3
Thinking of administrative innovations in your business, are they ...

Constant and ongoing (i.e. one or multiple projects in development); OR	☐
Regular (but not a constant); OR	☐
Occasional; OR	☐
Rare	☐

Tick one box

IF YOU DID NOT IDENTIFY

A PRODUCT INNOVATION (ABOVE)

OR

A PROCESS INNOVATION (ABOVE)

OR

AN ADMINISTRATIVE INNOVATION (ABOVE)

PLEASE GOTO QUESTION 12

Question 5
Please read the four statements below and indicate which is most applicable:

TICK

- **Innovations as they occur in our business are more usually...**
  A product or process that represents a New and Original Breakthrough advancing the state of the art in our industry or technology ☐

- **Innovations as they occur in our business are more usually...**
  An extension of our own product, processes or practices to which we have made or are making incremental improvements all the time ☐

- **Innovations as they occur in our business are more usually...**
  The introduction of a product, process or practice which we have observed elsewhere which we have sought to adopt and ADAPT it (i.e. not just copy but ADAPT it, improve it, add new features or strip out features) and then introduce it to our business/customers. ☐

- **Innovations as they occur in our business are more usually...**
  The introduction of a product, process or practice which we have observed elsewhere which we have sought to adopt **(copy/mirror)** and introduce into our business or to customers. ☐
  (Observed elsewhere could be by a competitor, or in a different country, or in a business journal, newspaper, industry best practice exemplar)

QUESTION 6
Would you say that the innovations that occur within your business:

Generally occur as part of a programme, strategy or plan ☐

OR

Occur more naturally or organically as a product of the work culture, team dynamics, etc i.e. not really programmed per se. ☐

QUESTION 7.
Please consider the degree and extent to which you agree or disagree with the following statements

Please tick as appropriate

	Strongly Agree	Agree	Disagree	Strongly Disagree
Our ability to innovate is largely dependent on our ability to generate surpluses (£cash)	☐	☐	☐	☐
Our ability to innovate is largely dependent on the availability of spare time to do so	☐	☐	☐	☐
We tend to innovate when we determine that an existing product or service is no longer performing as it should	☐	☐	☐	☐
Innovation in our business tends to be driven by one or more energetic individuals	☐	☐	☐	☐

QUESTION 8
How would you categorise the innovations that occur in your business:

Do they tend to be 'Discovery style projects' where you research and develop ideas for products or services and then take them to market/customers i.e. test the market? ☐

OR

Do they tend to be 'Pull-driven projects' i.e. very much to order (flow from a customer request) or in response to a particularly defined market need? ☐

QUESTION 9
In the last two years, did your business have any projects to develop or introduce new or significantly improved products (goods or services) or processes that were:

	Tick as appropriate
Abandoned; OR	☐
That have yet to be completed but are on time; OR	☐
Not yet completed but seriously delayed; OR	☐
Not even started; OR	☐
No/Not Applicable	☐

QUESTION 10
During the last two years, did your enterprise have any other innovation activities to develop or implement technological change not directly aimed at imminent new products or processes eg. basic R&D, technology watching i.e. slow-burn or more long term investments?

YES☐ **NO**☐

QUESTION 11
As a business did you spend any money in the last two years on...?

	YES	**NO**
Research & experimental development (R&D) - IN HOUSE	☐	☐
Acquisition of external R&D	☐	☐
Acquisition of machinery and equipment (including computer hardware) in connection with product or process innovation.	☐	☐
Acquisition of other external knowledge such as licences to use intellectual property (eg. patents, know-how) or specialised services (e.g. consultants, Universities, business support agencies).	☐	☐
All design functions, including industrial, product, process and service design and specifications for production or delivery.	☐	☐
Internal or external **training** for your personnel directly related to innovation activity.	☐	☐
Internal or external **marketing** activities aimed at the introduction of your enterprises innovations. Include market research and advertising of new innovations but exclude routine marketing activity.	☐	☐

SECTION 3

The following questions are about you business, specifically about the size of your business and aim to assist us to understand whether the businesses sampled in this study which have and have not reported innovatory activity are or have been experiencing a period of growth, consolidation or contraction.

QUESTION 12.1
How many full time staff does your business employ: ☐ Total Number of FTEs

QUESTION 12.2
Is this MORE or LESS than the figure two years ago?

MORE	☐	HOW MUCH MORE?	☐	%	**Go to 12.2.1**
LESS	☐	HOW MUCH LESS?	☐	%	**Go to 12.2.2**
SAME	☐				

12.2.1 *Tick*

Is the increase attributable to the acquisition of another business or part of it? YES ☐ NO ☐

Go to 13

12.2.2

Is the decrease attributable to the closure of part of business or a sale of part of the business? YES ☐ NO ☐

Go to 13

Question 13.1
How many of your employees would you say are <u>directly</u> concerned with innovation i.e. research and technological development, product/process development (innovation) e.g. product designers, engineers, scientists, developers i.e. creative-technical types)?

☐ Number of Employees

Or

☐ Percentage of all Employees

Question 13.2
What percentage of your workforce are qualified scientists or engineers? ☐ Percentage

QUESTION 14.1
What was your turnover in most recent financial year?

			,				,			
_	_	_		_	_	_		_	_	_

Millions *Thousands*

QUESTION 14.2
Is this MORE or LESS or just about the same as the figure two years ago?

MORE	☐	IN PERCENTAGE TERMS - HOW MUCH MORE?	%	**Go to 14.2.1**
LESS	☐	IN PERCENTAGE TERMS - HOW MUCH LESS?	%	**Go to 14.2.2**
SAME	☐	i.e. in line with inflation **Go to 15.1**		

QUESTION 14.2.1 *Tick*
Is the increase attributable to acquisition of another business or part of it? YES ☐ NO ☐

Go to Question 15

QUESTION 14.2.2
Is the decrease attributable to the closure of part of business or a sale of part of the business? YES ☐ NO ☐

Go to Question 15

QUESTION 15.1
What proportion/percentage of your turnover (if any) would you estimate is invested in research and development (developing new ideas, products, processes and/or ways of doing things)? ____ %

QUESTION 15.2
What proportion/percentage of your turnover (if any) would you estimate is invested in training? ____ %

QUESTION 15.3
In the last two years how many new products or services would you say your business has launched?

____ *Prompt: None, None really, 1, 2-3, 4-5, more than 5*

QUESTION 15.4
How many of these would you say have been successful?

____ *Prompt: None, None really, 1, 2-3, 4-5, more than 5*

QUESTION 16.1

Does your business hold any Quality Standards:	*Tick as applicable*
ISO 9000 standards	☐
Investors in People	☐
Environmental Standards	☐
Accreditation with other public agencies e.g. Business Support Agencies as an accredited supplier	☐
Accreditation with private sector businesses as a preferred supplier	☐
Other	☐

QUESTION 16.2

Does your business have or operate...

Website (providing basic information)	☐	CAD (Computer Assisted Design)	☐
Website (allowing customers to place orders & make payment)	☐	CAM (Computer Assisted Manufacturing)	☐
Web-site through which you do business with other businesses/clients e.g. file-sharing	☐	CAE (Computer Assisted Engineering)	☐
Intranet (Interconnected computers and networks within an organization)	☐	Other advanced IT applications (Over and above Microsoft Office Suite of Tools and applications)	☐
Extranet (An extranet can be viewed as part of a company's intranet that is extended to users outside the company)	☐	*[Tick all that apply]*	

QUESTION 16.3

In terms of protecting your businesses intellectual assets and know-how - On a scale of 1-4 (1 = Not important, 4 = Very Important) how important to your business is?				
Patent Protection	1 ☐	2 ☐	3 ☐	4 ☐
Registration of Trademarks	1 ☐	2 ☐	3 ☐	4 ☐
Copyright	1 ☐	2 ☐	3 ☐	4 ☐
Confidentiality Agreements	1 ☐	2 ☐	3 ☐	4 ☐
Pay & Reward strategies (Salaries. Bonuses, share option schemes and other benefits i.e. looking after your key personnel)	1 ☐	2 ☐	3 ☐	4 ☐

Please Tick as applicable

QUESTION 16.4
Has your enterprise participated in or received assistance from any of the following types of innovation-related public programmes in the last two years

(please tick all that apply)

Technology Development programmes (e.g. LINK, SMART)	☐
Technology Acquisition (e.g. Teaching Company Scheme - Knowledge Transfer Partnership Projects, Demonstration Projects)	☐
Management Information Programmes (e.g. Industry Clubs, Business Clubs and Associations (Chamber of Commerce, Institute of Directors), University and/or Local Sector network events,	☐
European programmes (eg. Framework, Eureka)	☐
Other	

QUESTION 16.5

How many people constitute your management team (e.g. Board of Directors, Partners)?	

Number

QUESTION 16.6

How many members of the management team own or have a stake in the ownership of the business?	

Number

QUESTION 16.7

Tick as appropriate

Is the management team tasked on functional lines i.e. Director of Finance, Sales, HR, R&TD, etc (and is this reflected in practice)? ☐

OR

Is it more informal i.e. more of a shared and collective undertaking with interchangeable roles, tasks, specialties? ☐

QUESTION 16.8

	YES	NO
Do any members of the business (outside the management team) own or have a stake in the ownership of the business?	☐	☐

QUESTION 16.9

How many of your employees are female?	

Number

Question 16.10

How many of your management/executive team are female?	

Number

QUESTION 17
Business Support
Did your enterprise receive or benefit from any public support (financial or other assistance and advice) for INNOVATION-RELATED activities in the last two years?

	YES		YES
Financial support	☐	Other	☐

Did this include?		Did this include support for?	
Grants	☐	Idea Creation	☐
Loans	☐	Idea definition	☐
Access to bank finance, seed and venture capital	☐	Idea Protection	☐
Financial forecasts, cash-flow, profit & loss, sales projections, etc	☐	Technical Feasibility	☐
Other	☐	Product design	☐
		Prototype development	☐
		Product testing (e.g. material testing, accelerated life testing)	☐
		Design for manufacture (e.g. Component design, assembly, capacity planning, supplier lists, factory layout)	☐
		Other	☐

QUESTION 18
Did your enterprise receive or benefit from any public support (financial or other assistance and advice) for GENERAL BUSINESS activities in the last two years

	YES		YES
Financial support	☐	Other	☐

Example		Example	
Grants	☐	Training	☐
Loans	☐	Consultancy	☐
Access to bank finance, seed and venture capital	☐	Information	☐
Financial forecasts, cash-flow, profit & loss, sales projections, etc	☐	Networking	☐
Other	☐	Marketing	☐
		ICT	☐
		Export	☐
		IPR	☐
		Quality	☐
		Tender Preparation	☐
		Other	☐

SECTION 4

QUESTION 19.1
Are you located at **Science Park E.G. North East Business Innovation Centre**

Or Other Business Incubator Park, Business Centre or

specialist business park/site

YES ☐ **NO** ☐

If YES: Name of facility:_____

QUESTION 19.2
Why did your company decide to obtain premises at the incubator?

i.e. what was the most significant factor - was it..

Favourable location and image; OR	☐
Quality, price and flexible terms for incubator units; OR	☐
Availability of professional business support services; OR	☐
Clustering and opportunity to network with similar businesses; OR	☐
Other factors - please specify below:	☐
Other: [details]	

QUESTION 19.3
What sort of incubator services have been particularly useful?
(1 = Most Useful, 4 = Least Useful)

	RANK
Pre-incubation Services	
Business planning and forming a company	
Training	
Information	
Advice and Support in development of new products, services and/or processes	
Help with raising finance	
Help with accessing R&TD Grants and Grants to support Innovation	
Access to seed-corn funding and venture capital funding	
Advice and support in recruitment and personnel management	
Other: (please specify:	
Other: [details]	

SECTION 5

These questions are asked to inform our understanding of why and how businesses are started with the region

QUESTION 20.1
About the FOUNDERS
Was the firm founded by: 1 person ☐
A partnership of more than one person ☐

QUESTION 20.2
What was the motivation at the start
Perceived a market opportunity, meeting a challenge, personal achievement, independence, improvement of social status, search for profit or a growth target ☐

Unemployment or a previous unsatisfactory professional experience ☐

QUESTION 20.3
Was the founder/How many of the founders were aged?

(Insert figure(s) depending on number of personnel)

Under 20 Years old	Age 21-30	Age 31-40	Age 41-50	Age 51-60	Age 60+
Number	*Number*	*Number*	*Number*	*Number*	*Number*

QUESTION 20.4
When the firm was established did the founder(s) have other means/income/jobs/business interests?
YES ☐ **NO** ☐

QUESTION 20.4
Have the founder(s) maintained or developed other means/income/jobs/business interests in addition to this business?
YES ☐ **NO** ☐

QUESTION 20.5
How was firm start financed *(Tick as appropriate)*
Through Sales/Advanced Orders? ☐
Overdraft? ☐
Bank Loan? ☐
Personal Loan (e.g. family)? ☐
Savings or Investment by partners? ☐
Redundancy Settlement/Gratuity? ☐
Investors (in exchange for equity)? ☐
Mortgage on home? ☐

QUESTION 20.6
Did founder(s) work previously together... *(Tick as appropriate)*
For same firm or organization? ☐
Different firms or organizations? ☐
Know each other socially but not worked together? ☐

QUESTION 20.7

Did the founder(s) have previous: *(Tick as appropriate)*

Management experience prior to business (i.e. executive or supervisory)?	☐
Experience in R&D?	☐
Experience in Sales and Marketing	☐
Experience in the field of consultancy?	☐
Experience in higher education?	☐
Experience in a large firm?	☐
Experience in a small firm?	☐
Experience in new venture creation, business development, commercialisation of research/new products/processes, etc?	☐
Experience as a self-employed?	☐
Experience in setting up a firm within the same sector?	☐
Experience in a family business	☐

QUESTION 20.8

Founder Education & Qualifications: *(Tick as appropriate)*

Postgraduate PhD/Mphil	☐	Undergraduate	☐
MBA	☐	A level	☐
MSc	☐	O level/GCSE	☐
MA	☐	Vocational/Trade Qualification(s)	☐

Appendix 2

NEBIC Tenant Case Studies

Company Name:	Images/Edect
Date Founded:	1999
About the Business:	Digital Imaging, retouching, manipulation and creative output – Business and market intelligence services
About the Founders:	The business was established with an investment from the founders who at the time of formation had other means/income/jobs/business interests which they have continued to maintain. The founders had worked together previously albeit in different businesses and between them brought a range of management and sales and marketing experience. The founders had also worked in small firms and large enterprises and had previous experience of establishing a business in this sector. Founder(s) Education and Qualifications: 'A' Level
Number of Employees:	3 FTEs of which two are described as directly concerned with innovation i.e. research and technological development
Turnover:	Not disclosed
Customer Profile:	21-30% International, 71-80% National of which 71-80% based in North East of England. Private sector businesses account for 71-80% and 6-10% public sector organisations.
Innovation:	The business reports product innovations (new to the firm) in the last two years developed not only 'in-house' but also by other businesses (and then implemented by the Company), and in co-operation with other businesses and with the support of business support agency staff.

Product innovation is described as a constant activity with one or multiple projects in development and is said to have made particularly significant contributions to extending the product/service range. The Company attributes 41-50% of current turnover to products introduced in the last two years.

The business also reports process innovations (new to the market) developed by other businesses and implemented by the Company. Process innovation is also described as a constant activity with one or multiple projects in development which are reported to have made a significant contribution to increased capacity.

The business characterises innovation in the business as generally seeking to advance the state of the art in the industry. While generally 'market-led/pull' (as opposed to 'discovery-push') the Company describes innovation as generally occurring organically i.e. the product of the work culture, team dynamics and often the drive of one or more energetic individuals. Further, innovation is often prompted when a product or service is determined to be no longer performing as it should relative to customer requirements and/or competitor products/services.

To support innovation and R&D, the business reported expenditure on machinery and equipment, design, training and marketing.

	The Company estimates that approximately 5% of turnover is invested research and development and a further 5% in training.
Quality Accreditation:	The Company is an accredited supplier to public agencies e.g. Business Links.
Application of ICT:	The Company has established a web-site featuring 'brochure-ware' an extranet and utilises CAD, CAM, CAE and other advanced ICT applications.
Intellectual Assets & IPR Protection:	The business accords a high value to confidentiality agreements.
Business Support:	In the last two years the Company has received a range of public sector business support that has included training, information and support for marketing.
Views on NEBIC Services:	The significant factor in the Company's decision to locate at NEBIC was the quality, price and flexible terms of the incubator units. The Company accords a high utility or value to 'Pre-incubation Services'; 'Business planning and forming a Company'; 'Training'; 'Information'; and 'Advice and Support in the development of New products, services and/or processes'. The Company ascribes a lesser value to other incubator services such as 'Help with raising finance'; 'Help with accessing R&TD grants and grants to support innovation'; 'Access to seed-corn funding and venture capital funding'; and 'Advice and support in recruitment and personnel management.

Company Name:	Heat Trace
Date Founded:	2001
About the Business:	Heat Tracing Specialists
About the Founders:	The business was founded by the current owner and was initially financed with a bank loan. The founder's previous experience included management, R&D, sales and marketing and experience of working in higher education. The founders also indicated that they had experiencd working in a large firm and as self-employed. Founder(s) Education and Qualifications: 'A'Level, 'O' Level and Vocational/Trade Qualifications.
Number of Employees:	46 FTEs, a 20% increase on the figure of two years ago. 4 members of staff were reported as directly concerned with R&D and 6 as qualified scientists or engineers.
Turnover:	£10,000,000 (up 40% on figure of two years ago)
Customer Profile:	UK only, 81-90% Private Sector Business.
Innovation:	The business reports product innovations in the last two years with relatively high levels of novelty (new to their market) and developed 'in-house'. Product innovation is described as a constant activity with one or multiple projects in development. Furthermore, product innovation was described particularly significant in extending the product/service range and penetrating new markets and increasing market share. The Company attributes 31-40% of turnover to products introduced in the last two years.

	The business also reports process innovations (new to the firm) developed 'in-house'. Process innovation is also described as a constant activity with one or multiple projects in development which are reported to have made significant contributions to reducing materials/energy costs, reducing labour costs, increased capacity and production flexibility. The business also reports administrative innovations as an on-going activity. While generally 'discovery push' the Company describes innovation as generally occurring organically i.e. the product of the work culture, team dynamics and often a factor of financial surpluses and 'spare' time. Innovation is also prompted when a product or service is determined to be no longer performing as it should relative to customer requirements and/or competitor products/services. To support innovation and R&D, the business reported expenditure on R&D in house only i.e. no expenditure in the last two years on e.g. machinery and equipment, design, training and marketing, etc. The Company estimates that approximately 20% of turnover is invested research and development and a further 20% in training.
Quality Accreditation:	The Business holds ISO 9000 standard accreditation.
Application of ICT:	The Company has established a web-site featuring 'brochure-ware' an extranet supporting business to business transactions, utilises CAD and other advanced ICT applications.

Intellectual Assets & IPR Protection:	The Company ascribes a high value to IPR protection (patents, trademarks, copyright, confidentiality agreements and pay and reward strategies (as a means of protecting and retaining 'know-how')
Business Support:	The business reports that it has not benefited from public sector business support other than that provided by NEBIC.
Views on Incubator Services:	The Company accords a high utility or value to 'Pre-incubation Services'; 'Training'; and 'Information'. The Company ascribes a lesser value to other incubator services such as 'Business planning and forming a Company'; Advice and Support in the development of New products, services and/or processes'. 'Help with raising finance'; 'Help with accessing R&TD grants and grants to support innovation'; 'Access to seed-corn funding and venture capital funding'; and 'Advice and support in recruitment and personnel management.

Company Name:	Hi Tech Seals and Polymers Ltd
Date Founded:	2004
About the Business:	Suppliers of hydraulic and pneumatic seals, gaskets, O rings and engineered plastic parts.
About the Founders:	The business was founded by two partners. The founder's previous experience included management, R&D, sales and marketing, and in higher education. The founders also reported previous experience in a large firm, family firm and as self-employed, and in new venture creation (in the same sector) and business development (commercialisation of research/new products/processes) Founder(s) Education and Qualifications: MSc, 'A'Level, 'O' Level/GCSE and Vocational/Trade Qualifications
Number of Employees:	5 FTEs, a 50% increase on two years ago. 2 members of staff were reported as directly concerned with R&D and 2 as qualified scientists or engineers.
Turnover:	Not disclosed.
Customer Profile:	International customers account for 6-10%, 81-90% UK customers of which 81-90% are located in the North East. 71-80% of customers are private sector businesses, 0-5% public sector organisations and the remainder private consumers.
Innovation:	The business reports product innovations in the last two years with high levels of novelty (new to their industry) and developed in collaboration with other businesses.

Product innovation is described as a constant activity with one or multiple projects in development and describes product innovation as particularly significant in improving product quality. The Company attributes 41-50% of turnover to products introduced in the last two years and 21-30% to products significantly improved.The business also reports administrative innovations as an on-going activity supported by business support agency staff.

The business characterises innovation in the business as generally comprising incremental improvements to the Company's own products and/or new and original innovations that advance the state of their art in their industry. While generally 'discovery push' the Company describes innovation as generally occurring organically i.e. the product of the work culture, team dynamics (often the work of an 'energetic' individual) and mainly a factor of time in which to do so. Innovation is often prompted when a product or service is determined to be no longer performing as it should relative to customer requirements and/or competitor products/services.

To support innovation and R&D, the business reported a range of expenditure on R&D in the last two years which has included investments in the acquisition of external R&D, licenses and specialised technology services, machinery and equipment, design, training and marketing The Company estimates that approximately 15% of turnover is invested research and development and a further 5% in training.

Quality Accreditation:	The business holds ISO 9000 standard accreditation and accreditation with public sector agencies as an approved supplier.
Application of ICT:	The Company has established a web-site featuring 'brochure-ware' and an extranet supporting business to business transactions. The Company also utilises CAD, CAE, and other advanced ICT applications.
Intellectual Assets & IPR Protection:	The Company ascribes a high value to IPR protection - patents, copyright, confidentiality agreements. The registration of trademarks and pay and reward strategies (as a means of protecting and retaining 'know-how') are reported as not important.
Business Support:	The Company reports that it has benefited from a range of Management Information programmes in the last two years and has received specific support for innovation (Idea creation, Idea definition and Idea Protection) and other general business support which has included business grants, training, consultancy, information and marketing.
Views on Incubator Services:	Location, image and the availability of professional business support services were identified as key to the decision to locate at NEBIC. The Company accords a high utility or value to 'Pre-incubation Services'; 'Advice and Support in the development of New products, services and/or processes'; 'Help with raising finance'; 'Help with accessing R&TD grants and grants to support innovation'; 'Access to seed-corn funding and venture capital funding'; and 'Training'. The Company ascribes

a lesser value to other incubator services such as 'Information'; 'Business planning and forming a Company'; and 'Advice and support in recruitment and personnel management.

Company Name:	I S Squared (Tricon Group)
Date Founded:	2004
About the Business:	Offering statistical services to businesses
About the Founders:	The business was founded by two partners. The founder's previous experience comprised management, sales and marketing, and consultancy. Previous experience also included working in a large firm, family firm, as self-employed; and new venture creation and business development (commercialisation of research/new products/processes). Founder(s) Education and Qualifications: MA, 'O' Level/GCSE and Vocational/Trade Qualifications.
Number of Employees:	2 FTEs who are both reported as directly concerned with R&D. 1 is a qualified scientist/engineer.
Turnover:	Not disclosed.
Customer Profile:	International customers account for 0-5% of sales, the remainder are UK based of which 71-80% are located in the North East. 71-80% of customers are private sector businesses, 0-5% are public sector organisations and the remainder private consumers.
Innovation:	The business reports no product or process innovations as occurring in the last two years. The business reports administrative innovations as an on-going 'in-house' activity. The business otherwise characterises innovation in the business as generally comprising incremental improvements to the Company's own products/services.

	While generally 'market-pull' the Company describes innovation as generally occurring organically i.e. the product of the work culture, team dynamics (often the work of an 'energetic' individual) and a factor of time in which to do so and/or when a product or service is determined to be no longer performing as it should relative to customer requirements and/or competitor products/services. To support innovation and R&D, the business reported a range of expenditure in the last two years which has included investments in the acquisition of licenses and specialised technology services, machinery and equipment, and training. The Company estimates that approximately 2% of turnover is invested in research and development and a further 5% in training.
Quality Accreditation:	The business has secured accreditation with public sector agencies and private sector businesses as an approved/preferred supplier.
Application of ICT:	The Company has established a web-site featuring 'brochure-ware' and utilises other advanced ICT applications.
Intellectual Assets & IPR Protection:	The Company ascribes a high value to confidentiality agreements. Patents, the registration of trademarks, copyright and pay and reward strategies (as a means of protecting and retaining 'know-how') are reported as not particularly important.
Business Support:	The Company reports that it has benefited from a range of Management Information programmes in the last two years and has received general business support which has included training and support for ICT.

Views on Incubator Services:	On its decision to locate at NEBIC, the Company identified location and image; quality, price and flexible terms, and the availability of professional business support services as significant factors. The Company accords a high utility or value to 'Pre-incubation Services' and 'Information'. The Company ascribes a lesser value to other incubator services such as 'Training', 'Advice and Support in the development of New products, services and/or processes'; 'Help with raising finance'; 'Help with accessing R&TD grants and grants to support innovation'; 'Access to seed-corn funding and venture capital funding'; 'Business planning and forming a Company'; and 'Advice and support in recruitment and personnel management'.

Company Name:	Sprint Finish
Date Founded:	2000
About the Business:	Print finishing services to printing industry
About the Founders:	The business was founded by two partners and financed with bank loans and an initial investment by the partners. The founder's previous experience includes management, sales and marketing, consultancy and higher education. The founders also report experience working in a small firm, and in new venture creation and business development (commercialisation of research/new products/processes). Founder(s) Education and Qualifications: Undergraduate degree.
Number of Employees:	18 FTEs of which 3 are reported as directly concerned with R&D. 2 FTEs are reported as qualified scientists/engineers.
Turnover:	£350,000 up 10% on figure two years ago.
Customer Profile:	International customers account for 0-5% of sales, the remainder are based in the UK of which 41-50% are located in the North East. 71-80% of customers are private sector businesses, 0-5% public sector organisations and the remainder private consumers.
Innovation:	The business reports no product or process innovations in the last two years, but reports administrative innovations as an on-going activity undertaken 'in-house' and/or by other businesses or institutions and then implemented by the Company and/or in co-operation with other businesses and/or in consultation with clients or customers.

	Innovation as generally occurring in the business is said to comprise incremental improvements to the Company's existing product/service range and, moreover, as 'market-led/pull' innovations - the outcome of strategies and plans. The Company reported that innovation tended to be driven by one or more energetic individuals and was often prompted when the Company determined that a product or service was no longer performing as it should relative to customer requirements and expectations or competitor products and services. To support innovation and R&D, the business reported a range of expenditure in the last two years which has included investments 'in-house', the acquisition of external R&D, the acquisition of machinery and equipment, licenses and specialised technology services, training and marketing. The Company estimates that approximately 10% of turnover is invested research and development and training.
Quality Accreditation:	The business has secured Investors in People accreditation and accreditation with private sector businesses as an approved/preferred supplier.
Application of ICT:	The Company has established a web-site featuring 'brochure-ware' and utilises CAD and other advanced ICT applications.
Intellectual Assets & IPR Protection:	The Company ascribes a high value to copyright, confidentiality agreements and pay and reward strategies (as a means of protecting and retaining 'know-how'). Patents, and the registration of trademarks, are reported as not particularly important.

Business Support:	The Company reports that it has benefited from a range of general (public) business support which has included training, marketing and support for ICT.
Views on Incubator Services:	On its decision to locate at NEBIC, the Company identified location and image; quality, price and flexible terms as the most significant factors. The Company accords a high utility or value to 'Advice and Support in the development of New products, services and/or processes', 'Pre-incubation Services' and 'Information'. The Company ascribes a lesser value to other incubator services such as 'Training'; 'Help with raising finance'; 'Help with accessing R&TD grants and grants to support innovation'; 'Access to seed-corn funding and venture capital funding'; 'Business planning and forming a Company'; and 'Advice and support in recruitment and personnel management.

Company Name:	Micro Image Document Systems
Date Founded:	2000
About the Business	Transferring Documents Images to CD Rom and associated retrieval software .
About the Founders:	The business was founded by two partners and financed via advanced order and on the basis of an initial investment by the partners. At start up the founders had other means/income/jobs/business interests which they have subsequently maintained. The founder's who had worked together previously, albeit for different firms, possessed previous experience in 'Management', 'Sales & Marketing', 'Consultancy', 'Higher Education' and experience in a large firm. Founder(s) Education and Qualifications: Undergraduate degree.
Number of Employees:	8 FTEs
Turnover:	£80,000
Customer Profile:	International customers account for 81-90% of sales, the remainder in the UK of which 31-40% are located in the North East. 71-80% Private Sector Business, 11-20% public sector organisations and the remainder private consumers (less than 5%).
Innovation:	The business reports no product or process innovations in the last two years, but reports administrative innovations as a regular activity undertaken 'in-house'. Innovation as generally occurring in the business is said however to occur as new original breakthroughs advancing the state of the art in the industry and

	moreover, as 'discovery-push' initiatives which are nevertheless the outcome of strategies and plans. To support innovation and R&D, the business reported a range of expenditure in the last two years which has included investments in the acquisition of machinery and equipment, licenses and specialised technology services, training and marketing.
Quality Accreditation:	The business has secured accreditation with private sector businesses as an approved/preferred supplier
Application of ICT:	The Company has established a web-site featuring 'brochure-ware' and supporting transactions with customers (file-sharing) and utilises other advanced ICT applications.
Intellectual Assets & IPR Protection:	The Company ascribes a high value to copyright, confidentiality agreements. Pay and reward strategies (as a means of protecting and retaining 'know-how'), Patents, and Trademarks are reported as not particularly important.
Business Support:	The Company reports that it has not benefited from public sector business support other than services accessed at NEBIC
Views on Incubator Services:	On its decision to located at NEBIC, the Company identified location and image; quality, price and flexible terms; and the availability of professional business support services on site as most significant. In addition, the decision to locate at NEBIC was also supported by a personal recommendation.

The Company accords a high utility or value to 'Information', 'Pre-incubation Services', 'Business planning and forming a Company' and 'Training.

'Advice and Support in the development of New products, services and/or processes'; and 'Advice and support in recruitment and personnel management were accorded a low utility while

'Help with raising finance'; 'Help with accessing R&TD grants and grants to support innovation'; 'Access to seed-corn funding and venture capital funding' were accorded no utility/value.

Company Name:	Meridian Marketing Ltd
Date Founded:	1998
About the Business:	Marketing Consultancy
About the Founders:	The founder, who financed the business start with an initial investment from personal savings had previous management, sales and marketing, consultancy, higher education gained in a large firm. In addition, the founder had experience of new venture creation, business development, commercialisation of research/new products/processes, etc. Founder(s) Education and Qualifications: Undergraduate degree.
Number of Employees:	16 FTEs (which has risen from a figure of two, two years ago) of which two are identified as specifically concerned with innovation i.e. research and development, product/process development
Turnover:	£230,000 (50% up on the figure of two years ago)
Customer Profile:	International customers account for 0-5% of sales, the remainder in the UK of which 41-50% are located in the North East. 61-70% of customers are Private Sector Business, 31-40% public sector organisations and 6-10% private consumers.
Innovation:	The business reports no product or process innovations in the last two years, but reports administrative innovations as a constant endeavour, undertaken 'in-house'. Innovation as generally occurring in the business is said however to occur as new original breakthroughs

	advancing the state of the art in the industry and moreover, as 'discovery-push' initiatives and are generally a product of team dynamics rather than strategy or plans. Innovation, as reported by the Company was more likely to be prompted by a determination than products or services were no longer performing as they should and is generally driven by one or more individuals. To support innovation and R&D, the business reported a range of expenditure in the last two years which has included investments in the acquisition of machinery and equipment, training and marketing. The Company reports that approximately 25% of turnover is invested in research and development.
Quality Accreditation:	The business reports that it is moving towards ISO 9000 accreditation and that it has secured accreditation with public agencies (DMA) as an approved supplier.
Application of ICT:	The Company has established a web-site featuring 'brochure-ware' and supporting transactions with customers (file-sharing).
Intellectual Assets & IPR Protection:	The Company ascribes a high value to confidentiality agreements and pay and reward strategies (as a means of protecting and retaining 'know-how'). Patents, Trademarks and Copyright are reported as not particularly important.
Business Support:	The Company reports that it has benefited from a range of public sector business support that has included Training, Information, Marketing and ICT support.

Views on Incubator Services:	On its decision to locate at NEBIC, the Company identified location and image; quality, price and flexible terms; the availability of professional business support services on site as most significant; and the opportunity to network with other businesses. The Company accords a high utility or value to 'Pre-incubation Services', 'Information', 'Advice and Support in the development of New products, services and/or processes' 'Business planning and forming a Company'; 'Training'; and 'Advice and support in recruitment and personnel management'. 'Help with raising finance was accorded a low utility while 'Help with accessing R&TD grants and grants to support innovation'; 'Access to seed-corn funding and venture capital funding' were accorded no utility/value.

Company Name:	Maxim Cleaning Services Ltd
Date Founded:	2004 (yet to complete first years trading)
About the Business:	Specialist Cleaning Contractors
About the Founders:	The founder, who financed the business start with an initial investment from personal savings and mortgage on own home had previous management experience gained in a large firm. Founder(s) Education and Qualifications: O level/GCSE.
Number of Employees:	7 FTEs and 20 part time staff
Turnover:	Yet to complete first year of trading.
Customer Profile:	International customers account for 0-5% of sales, the remainder in the UK of which 81-90% are located in the North East. 91-100% of customers are Private Sector Business, 0-5% public sector organisations and 0-5% private consumers.
Innovation:	The business reports no product innovations in the last two years, but does however report process innovations (new to their firm), which feature regularly and are generally developed 'in-house'; in consultation with suppliers, customers, and with the assistance of Business Support Agency staff to which the Company accords 41-50% of turnover. The Company credits process innovation with significant contributions to reducing materials and/or energy costs and increasing capacity. Innovation as generally occurring in the business is said however to occur as incremental improvements to the Company's own products/services and, moreover, as 'market-led' initiatives and are generally a product of

	team dynamics rather than an outcome of strategy or plans. Innovation, as reported by the Company, was more likely to be prompted by a determination than products or services were no longer performing as they should. To support innovation and R&D, the business reported expenditure in the last two years on the acquisition of machinery and equipment and training.
Quality Accreditation:	No
Application of ICT:	The Company has established a web-site featuring 'brochure-ware' and supporting transactions with customers (file-sharing).
Intellectual Assets & IPR Protection:	The Company ascribes little or no importance to IPR protection.
Business Support:	The Company reports that it has benefited from a range of public sector business support that has included Information, Marketing and ICT support.
Views on Incubator Services:	On its decision to locate at NEBIC, the Company identified location and image; and recommendation for businesses already located at NEBIC as the most significant factors. The Company accords a high utility or value to 'Pre-incubation Services', 'Information', 'Advice and Support in the development of New products, services and/or processes' 'Business planning and forming a Company'; 'Training'; and 'Advice and support in recruitment and personnel management'. 'Help with raising finance was accorded a low utility while 'Help with accessing R&TD grants and grants to support innovation'; 'Access to seed-corn funding and venture capital funding' were accorded no utility/value.

Company Name:	Joe Prince
Date Founded:	2004
About the Business:	On-line specialist clothing
About the Founders:	The founders financed the business start with an initial investment from personal savings. The founders had worked together albeit for different organisations and possessed previous experience in management, sales and marketing, consultancy, higher education, small firms and in a family business. Founder(s) Education and Qualifications: A level.
Number of Employees:	12 FTEs of which 1 is reported to be directly concerned with R&D, and product/process development.
Turnover:	£98,000 (up 20% on last year)
Customer Profile:	International customers account for 11-20% of sales, the remainder are based in the UK of which 11-20% are located in the North East. 51-60% of customers are private sector businesses, 0-5% are public sector organisations and the remainder private consumers.
Innovation:	The business reports no product innovations in the last two years, but does however report process innovations (new to their firm), which feature regularly and are generally developed 'in-house' to which the Company accords 21-30% of current turnover. The Company credits process innovation with significant contributions to increased flexibility. The Company also reports administrative innovations (new to their firm and developed in house). Innovation as generally occurring in the business is said

	however to occur generally as adapted adoptions i.e. products, services or practices which the Company has observed elsewhere and has adopted with improvements. Moreover, innovations as said to be generally 'market-led' though not generally the outcome of strategy or plans. Innovation, as reported by the Company was more likely to be prompted by the existence of surpluses and a determination than products or services were no longer performing as they should. To support innovation and R&D, the business reported expenditure in the last two years on the acquisition of machinery and equipment, external knowledge (licenses), training and marketing.
Quality Accreditation:	The Company has secured accreditation with private sector businesses as an approved/preferred supplier.
Application of ICT:	The Company has established a web-site featuring 'brochure-ware', allowing customers to place orders and make payment and support transactions with customers (file-sharing). The Company operates an intranet and utilises CAD and other advanced IT applications.
Intellectual Assets & IPR Protection:	The Company ascribes a high value to copyright and confidentiality agreements, the registration of trademarks and pay and rewards strategies (as a means to protecting retaining intellectual assets) but accords little importance to patent protection.
Business Support:	The Company reports that it has benefited from a range of public sector business support to support innovation (specifically Idea Protection, Product Design and Prototype Development) and has also accessed general support vis-à-vis Training, Marketing and ICT support.

Views on Incubator Services:	On its decision to locate at NEBIC, the Company identified location and image; quality, price and flexible terms and the opportunity to network with similar businesses via NEBIC as significant factors. The Company accords a high utility or value to 'Pre-incubation Services', 'Information' and 'Training'. 'Business planning and forming a Company'; and 'Advice and Support in the development of New products, services and/or processes' are accorded a lower utility value while and 'Help with raising finance'; 'Help with accessing R&TD grants and grants to support innovation'; 'Access to seed-corn funding and venture capital funding'; and 'Advice and support in recruitment and personnel management' indicated as 'least useful' services.

Company Name:	Marine Response Ltd
Date Founded:	2000
About the Business:	Insurance Claims handling intermediary representing the interests of insured shipowners and their marine liability insurers.
About the Founders:	The founders financed the business start with an initial investment from personal savings. The founders had worked together previously for the same firm and possessed previous experience in management, sales and marketing, consultancy, higher education, and of working in a small firm. Founder(s) Education and Qualifications: A level.
Number of Employees:	11 FTEs (approximately 20% up on the figure reported two years ago).
Turnover:	Not disclosed.
Customer Profile:	International customers account for 11-20% of sales, the remainder are UK based of which 61-70% are located in the North East. 61-70% of customers are Private Sector Business, 0-5% public sector organisations and the remainder (21-30%) private consumers.
Innovation:	The business reports no product or process innovations in the last two years, but does however report administrative innovations (new to their firm), which are ongoing and are generally developed 'in-house'. Innovation as occurring in the business is said generally to be extensions of the Company's own products and services. Moreover, innovations as said to be generally 'market-led/pull' and are generally the outcome of strategy or plans.

	To support innovation and R&D, the business reported expenditure in the last two years on the acquisition of machinery and equipment, external knowledge (licenses), and training.
Quality Accreditation;	The Company has secured Investors in People accreditation, accreditation against Environmental Standards and accreditation with public sector organisations as an approved/preferred supplier.
Application of ICT:	The Company has established a web-site featuring 'brochure-ware' and supporting transactions with customers (file-sharing). The Company also utilises other advanced IT applications.
Intellectual Assets & IPR Protection:	The Company ascribes a high value to confidentiality agreements but little or no value to copyright, patent protection, trademarks and pay and rewards strategies (as a means to protecting retaining intellectual assets).
Business Support:	The Company reports that it has benefited from a range of public sector business support specifically Training, Information and ICT support.
Views on Incubator Services:	On its decision to locate at NEBIC, the Company identified location and image; and quality, price and flexible terms as significant factors. The Company accords a high value to 'Information', 'Pre-incubation Services'; 'Business planning and forming a Company'; 'Training'; and 'Advice and Support in the development of New products, services and/or processes'. 'Advice and support in recruitment and personnel management' were accorded a lower value. 'Help with raising finance'; 'Help with accessing R&TD grants and grants to support innovation'; and 'Access to seed-corn funding and venture capital funding' were reported as 'least useful'.

Company Name:	Lomax Associates
Date Founded:	2001
About the Business:	Business and management training. Specialist trainer/assessors to gas industry to recognised national standards.
About the Founders:	The founder financed the business start with an initial investment from personal savings and had previous experience in management, consultancy, higher education and of working in a large firm. Founder(s) Education and Qualifications: MBA.
Number of Employees:	26 FTEs (approximately 60% are qualified engineers or scientists). Employment is up a reported 100% on the figure of two years ago.
Turnover:	£1,200,000 (50% up on the figure of two years ago).
Customer Profile:	International customers account for 0-5% of sales, the remainder in the UK of which 81-90% are located in the North East. 31-40% of customers are Private Sector Business, 61-70% public sector organisations and the remainder (0-5%) private consumers.
Innovation:	The business reports process innovations (new to the firm) in the last two years, which are reported as a regularly occurring and developed in consultation with clients or customers and to which the Company attributes 11-20% of current turnover. The Company credits product innovation as making significant contributions to extending the Company's range of products/services; increasing market share and penetrating new markets; and improving product/service quality.

	The Company also reports Administrative innovations (new to the firm), reported as constant and on-going and developed 'in-house', in co-operation with other businesses, in consultation with suppliers, clients or customers. Innovation as occurring in the business are said generally to be extensions of the Company's own products and services. Moreover, innovations are said to be generally 'market-led/pull' and generally the outcome of strategy or plans. The availability of surpluses are noted as a factor in the Company's ability to innovate, as are the efforts of one or more energetic individuals. Uppermost however as a driver of innovation in the business are determinations that products or services are no longer performing as they should relative to customer requirements and/or competitor offerings. To support innovation and R&D, the business reported expenditure in the last two years on the acquisition of machinery and equipment, training and marketing. The Company reports that approximately 10% of turnover is invested in R&D/efforts to develop new products/services and 25% in training.
Quality Accreditation:	The Company has secured ISO 9000 and Investors in People accreditation, accreditation against Environmental Standards, accreditation with both public sector organisations and private sector businesses as an approved/preferred supplier.
Application of ICT:	The Company has established a web-site featuring 'brochure-ware' and supporting transactions with customers (file-sharing).

Intellectual Assets & IPR Protection:	The Company ascribes a high value to confidentiality agreements and copyright but little or no value to patent protection, registration of trademarks or pay and rewards strategies (as a means to protecting retaining intellectual assets).
Business Support:	The Company reports that it has benefited from a range of public sector business support specifically Training, Consultancy, Information, Marketing, Quality and ICT support. The Company has also availed itself of public sector business support to support innovation, specifically Idea Creation.
Views on Incubator Services:	On its decision to locate at NEBIC, the Company quality, price and flexible terms as a significant factor. The Company accords a high utility or value to 'Information', 'Pre-incubation Services'; 'Business planning and forming a Company'; 'Information'; 'Advice and Support in the development of New products, services and/or processes'; 'Advice and support in recruitment and personnel management'. Training was accorded a lower utility value while 'Help with raising finance'; 'Help with accessing R&TD grants and grants to support innovation'; and 'Access to seed-corn funding and venture capital funding' were reported as 'least useful'.

Company Name:	Northern Defence Industries
Date Founded:	2001
About the Business:	Northern Defence Industries (NDI) is an organisation that assists its members to develop and grow their businesses in the global defence and aerospace sector. The business provides members with networking opportunities, promotional support, customer contact, technology transfer and supports cluster development.
About the Founders:	N/A
Number of Employees:	7 FTEs – 50% up on the figure of two years ago - of which all are reported to be concerned with research and technological development and/or the development of new products and services.
Turnover:	£680,000
Customer Profile:	International customers account for 11-20% of sales, the remainder in the UK of which 81-90% are located in the North East. 91-100% of customers are Private Sector Business, 0-5% public sector organisations and the remainder (0-5%) private consumers.
Innovation:	The business reports both product and process innovations (new to the industry) in the last two years. Both Product and Process innovations are reported as a constant and ongoing activity (developed 'in house') to which 6-10% of current turnover is now attributed. Product innovation is reported as making a significant contribution to the product/service range and a very significant contribution to opening new markets, increasing market share and improving the quality of products and services.

	Process innovations are reported to have made significant contributions to flexibility and increased capacity. Innovation as occurring in the business is said generally to be extensions of the Company's own products and services. Moreover, innovations as said to be generally 'discovery-style' but are generally said to be the outcome of strategy or plans. The efforts of one or more energetic individuals are noted as instrumental to innovation occurring in the business and determinations that products or services are no longer performing as they should. To support innovation and R&D, the business reported expenditure in the last two years on the acquisition of machinery and equipment, the acquisition of external knowledge, design functions, and marketing. The Company reports that approximately 30% of turnover is invested in R&D/efforts to develop new products/services and 10% in training.
Quality Accreditation:	The Company has secured ISO 9000 accreditation
Application of ICT:	The Company has established a web-site featuring 'brochure-ware', an intranet and utilises other advanced ICT applications.
Intellectual Assets & IPR Protection:	The Company ascribes a high value to the registration of trademarks, confidentiality agreements and copyright and pay and rewards strategies (as a means to protecting retaining intellectual assets) and little/no value to patent protection.

Business Support:	The Company reports that it has benefited from public sector business support grants in the last two years.
Views on Incubator Services:	N/A

Company Name:	Neutronic Technologies Ltd
Date Founded:	2000
About the Business:	Electronic repair services – PCB repairs, robotics and PLC
About the Founders:	N/A
Number of Employees:	7 FTEs – 20% up on the figure of two years ago - of which 3 are reported as concerned with research and technological development and/or the development of new products and services and are qualified scientists or engineers.
Turnover:	£300,000 (reportedly 50% up on the figure of two years ago)
Customer Profile:	International customers account for 6-10% of sales, the remainder in the UK (North East). 91-100% of customers are Private Sector Business, 0-5% public sector organisations and the remainder (0-5%) private consumers.
Innovation:	The business reports both product and process innovations (new to the industry) in the last two years. The Company also reports administrative innovations. Product innovation is reported as a regular activity (developed 'in house') to which 21-30% of current turnover is now attributed. Product innovation is reported as making significant contributions to the product/service range, opening new markets, increasing market share and improving the quality of products and services.

	Process innovations as a constant endeavour and are reported to have made significant contributions to flexibility and increased capacity. Innovation as occurring in the business is said generally to be extensions of the Company's own products and services. Moreover, innovations as said to be generally 'market-led/pull' and the outcome of strategy or plans. To support innovation and R&D, the business reported expenditure in the last two years on the acquisition of external R&D, machinery and equipment, the acquisition of external knowledge, training and marketing and other long-term investments.
Quality Accreditation:	The Company has secured ISO 9000 accreditation
Application of ICT:	The Company has established a web-site featuring 'brochure-ware', functions to accept orders and payment, an intranet, CAD and utilises other advanced ICT applications.
Intellectual Assets & IPR Protection:	The Company ascribes a little or no value to patent protection, the registration of trademarks, confidentiality agreements and copyright. Pay and rewards strategies (as a means to protecting/retaining intellectual assets) is noted as key.
Business Support:	The Company reports that it has benefited from public sector business support programmes and grants to support innovation/R&D in the last two years.
Views on Incubator Services:	N/A

Company Name:	North East Product Development
Date Founded:	2003
About the Business:	Designing essential modern day products, equipment hire and employment pack for employment market
About the Founders:	N/A
Number of Employees:	8 FTEs – 90% up on the figure of two years ago - of which 8 are reported as concerned with research and technological development and/or the development of new products and services and are qualified scientists or engineers.
Turnover:	£700,000
Customer Profile:	International customers account for 0-5% of sales, the remainder are UK based (81-90% North East). 71-80% of customers are Private Sector Business, 21-30% public sector organisations and the remainder (0-5%) private consumers.
Innovation:	The business reports both product and process innovations (new to the industry) and administrative innovations in the last two years. Product innovation is reported as a constant endeavour with multiple projects in development (developed 'in house') and as making significant contributions to the product/service range, opening new markets, increasing market share and improving the quality of products and services. Process innovation is also reported as a constant endeavour (developed 'in house'), and making significant contributions to increased flexibility and capacity and reduced materials/energy and labour costs.

	Innovation as occurring in the business is said generally to be extensions of the Company's own products and services. Moreover, innovations are said to be 'discovery-style' initiatives and organic i.e. the product of work culture and team dynamics (particularly the endeavour of one or more individuals) as opposed to the outcome of strategy or plans. To support innovation and R&D, the business reported expenditure in the last two years 'in-house', the acquisition of external R&D, machinery and equipment, the acquisition of external knowledge, design functions, training and marketing.
Quality Accreditation:	The Company has secured ISO 9000 accreditation
Application of ICT:	The Company has established a web-site featuring 'brochure-ware', functions to accept customer orders and payment, an intranet, and utilises other advanced ICT applications.
Intellectual Assets & IPR Protection:	While the Company ascribes a little or no value to patent protection, the registration of trademarks, confidentiality agreements and copyright, and pay and reward strategies (as a means to protecting/retaining intellectual assets) are noted as very important.
Business Support:	The Company reports that it has benefited from public sector business support programmes, specifically grants to support innovation/R&D in the last two years.
Views on Incubator Services:	N/A

Company Name:	Salamander Pumps
Date Founded:	N/A
About the Business:	Designing essential modern day products, equipment hire and employment pack for employment market
About the Founders:	The founders had worked together previously, albeit for different firms. Previous experience included management, R&D, sales and marketing, consultancy. In addition, the founders had experience of working in higher education, large and small firms, as self-employed and working in a family business. Furthermore, they had experience of new venture creation and in the same sector. Founder(s) Education and Qualifications: Undergraduate degree
Number of Employees:	30 FTEs – 40% up on the figure of two years ago - of which 3 are reported as concerned with research and technological development and/or the development of new products and services and are qualified scientists or engineers.
Turnover:	Not disclosed.
Customer Profile:	International customers account for 0-5% of sales, the remainder in the UK. 81-90% of customers are private sector businesses, 0-5% public sector organisations and the remainder (0-5%) private consumers.
Innovation:	The business reports product innovations (new to the industry), process innovations (new to the firm) and administrative innovations (new to the firm) in the last two years.

Product innovation is reported as a constant endeavour (and developed in co-operation with other institutions – universities and research centres). Product innovation (in the last two years) is reported as making significant contributions to the product/service range, opening new markets, increasing market share and improving the quality of products and services and accounts for 21-35% of current turnover. Process and Administrative innovations are also reported as constant endeavours (developed with financial assistance from European, National and/or Regional Research Grants and Awards). The former are credited with making significant contributions to increased flexibility and capacity and reduced materials/energy and labour costs.

Innovations as occurring in the business are said generally to be extensions of the Company's own products and services. Moreover, innovations are said to be 'discovery-style' initiatives and the outcome of strategies and plans. The Company indicates that the availability of surpluses and the drive of individuals are instrumental in the ability of the Company to innovate. The Company also indicates that innovation is prompted by determinations that products or services are no longer performing as they should.

To support innovation and R&D, the business reported expenditure in the last two years 'in-house', on the acquisition of machinery and equipment, design functions, and training.

Quality Accreditation:	The Company has secured ISO 9000 and Investors in People accreditation, accreditation against Environmental Standards, and accreditation with public agencies and private sector businesses as approved/preferred suppliers.
Application of ICT:	The Company has established a web-site featuring 'brochure-ware', an intranet, CAD, and utilises other advanced ICT applications.
Intellectual Assets & IPR Protection:	While the Company describes patent protection, confidentiality agreements and pay and reward strategies (as a means to protecting/retaining intellectual assets) as important to the business. The registration of trademarks and copyright are reported as unimportant.
Business Support:	The Company has participated in innovation-related public programmes (Teaching Company Scheme, Knowledge Trasnfer Partnership projects and Demonstration projects) and has received public grants to support process innovation/development.
Views on Incubator Services:	Location and image were instrumental in the decision to locate the Company at NEBIC. The Company accords a high utility or value to 'Training'; 'Information' and 'Help with accessing R&TD grants and grants to support innovation'. 'Pre-incubation Services'; 'Business planning and forming a Company'; 'Advice and Support in the development of New products, services and/or processes'; 'Advice and support in recruitment and personnel management'; 'Help with raising finance'; and 'Access to seed-corn funding and venture capital funding' were reported as 'least useful'.

Company Name:	Tree Pax Ltd
Date Founded:	2000
About the Business:	Training, Consultancy and Workshops for Idea Generation and Innovation.
About the Founders:	N/A
Number of Employees:	3 FTEs all of which are reported as concerned with research and technological development and/or the development of new products and services.
Turnover:	Not disclosed.
Customer Profile:	International customers account for 11-20% of sales, while the remainder are located in the UK (81-90% in the NorthEast). 71-8-% of customers are private sector businesses, 21-30% are public sector organisations and the remainder (0-5%) private consumers.
Innovation:	The business reports product innovations (new to the firm), process innovations (new to the industry) and administrative innovations (new to the firm) in the last two years. Product innovation is reported as a regular occurrence (developed in house) to which the Company attributes 6-10% of current turnover. Product innovation (in the last two years) is reported as making very significant contributions to the product/service range, opening new markets, increasing market share and improving the quality of products and services. Process innovation is reported as a constant endeavour (developed in house), and Administrative innovations a regular occurrence. Moreover, innovations are said to be 'discovery-style' initiatives and the outcome of strategies and plans.

Quality Accreditation:	No
Application of ICT:	The Company has established a web-site featuring 'brochure-ware' and utilises other advanced ICT applications.
Intellectual Assets & IPR Protection:	The Company accords a high value to patent protection, the registration of trademarks, copyright, confidentiality agreements and pay and reward strategies (as a means to protecting/retaining intellectual assets).
Business Support:	The Company reports that it has not benefited from public sector business support in the last two years.
Views on Incubator Services:	N/A

Company Name:	Computer House
Date Founded:	1982
About the Business:	ICT specialists
About the Founders:	The founders reportedly knew each other socially but had not worked together with experience in management, R&D, consultancy, higher education and in a large firm. Founder(s) Education and Qualifications: Undergraduate degree.
Number of Employees:	39 FTEs (up 20% on the figure of two years ago), 20% of whom are reported as concerned with research and technological development and/or the development of new products and services.
Turnover:	Up 40% in last two years, actual figures not disclosed.
Customer Profile:	100% of customers are located in the UK, 6-10% are located in the North East. Private Sector Business account for 41-50% of customers and 41-50% public sector organisations.
Innovation:	The business reports product innovations (new to the industry), process innovations (new to the firm) and administrative innovations (new to the firm) in the last two years. Product innovation is reported as a constant occurrence (developed in house, in co-operation with other businesses, in consultation with suppliers, clients or customers, with the support of Business Support Agency staff (i.e. as part of public sector business support programmes) and with financial assistance from European, national or regional research grants or awards.

Product innovation (in the last two years) is reported as making significant contributions to the product/service range, opening new markets, increasing market share and improving the quality of products and services.

Process innovation is reported as a regular occurrence (developed by other businesses or institutions and then implemented by the Company, in co-operation with other businesses and in consultation with suppliers). Process innovations are reported as making a significant contribution to reducing materials/energy costs and labour costs, improved flexibility and a very significant contribution to increased capacity.

Administrative innovations are reported as an occasional occurrence (developed in house, by other businesses or institutions and then implemented by the Company, in co-operation with other businesses and in consultation with suppliers and customers).

Innovation is generally described as incremental improvements to the Company's own products and services and mix of 'discovery-style' and 'market pull' initiatives. The Company indicated that innovation was more usually organic and the product of individual/team endeavour as opposed to the outcome of strategies and plans. The Company reported that it had recently (in the last two years) invested in R&D in house, the acquisition of machinery and equipment, training and marketing and that approximately 20% of turnover was invested in the development of new products and/or services.

Quality Accreditation:	The Company indicated that it had secured accreditation with public sector organisations and private sector businesses as an approved/preferred supplier.
Application of ICT:	The Company has established a web-site featuring 'brochure-ware', operates and intranet and utilises other advanced ICT applications.
Intellectual Assets & IPR Protection:	The Company accords a high value to the registration of trademarks, copyright and confidentiality agreements and less so to pay and reward strategies (as a means to protecting/retaining intellectual assets). Patent protection was reported as unimportant.
Business Support:	The Company reports that it has benefited from public sector business support in the last two year, particularly grants , training, consultancy and marketing.
Views on Incubator Services:	N/A

Company Name:	Cadunits
Date Founded:	2000
About the Business:	Provides training and support for the UNIX and CAD/CAM market place.
About the Founders:	N/A
Number of Employees:	2 FTEs (up 100% on the figure of two years ago), one of whom is reported as concerned with research and technological development and/or the development of new products and services.
Turnover:	£40,000
Customer Profile:	0-5% of business sales are international, 91-100% located in the UK, and 0-5% located in the North East. Private sector businesses account for 91-100% of customers, 0-5% public sector organisations and 0-5% private consumers.
Innovation:	The business reports product innovations (new to the industry), process innovations (new to the industry) and administrative innovations (new to the firm) occurring in the last two years. Product innovation is reported as a regular occurrence (developed by other business or institutions and then rolled out by the Company). Product innovation (in the last two years) is reported as making significant contributions to the product/service range, opening new markets, increasing market share and improving the quality of products and services. Process innovation is reported as a regular occurrence (generally developed in house). Process innovations are

	reported as making a significant contribution to improved flexibility and increased capacity. Administrative innovations are also reported as a regular occurrence (developed in house). Innovation is generally described as incremental improvements to the Company's own products and services and are said generally to comprise 'discovery-style' initiatives. The Company indicated that innovation was more usually organic and the product of individual/team endeavour as opposed to the outcome of strategies and plans. The Company reported that it had recently (in the last two years) invested in: R&D in house, in the acquisition of machinery and equipment, external knowledge (e.g.licenses) training and marketing.
Quality Accreditation:	The Company indicated that it had secured accreditation with public sector organisations.
Application of ICT:	The Company has established a web-site featuring 'brochure-ware', operates CAD, CAM, CAE and utilises other advanced ICT applications.
Intellectual Assets & IPR Protection:	The Company accords a high value to patent protection, the registration of trademarks, copyright and confidentiality agreements and, to a lesser extent, pay and reward strategies (as a means to protecting/retaining intellectual assets).
Business Support:	The Company reports that it has not benefited from public sector business support in the last two years.
Views on Incubator Services:	N/A

Company Name:	IQ Management Systems
Date Founded:	1991
About the Business:	Delivers training and consultancy in quality, safety and the environment
About the Founders:	N/A
Number of Employees:	3 FTEs
Turnover:	Not disclosed.
Customer Profile:	0-5% of business sales are international, 91-100% located in the UK, of which 51-60% are located in the North East. Private sector businesses account for 71-80% of customers, 11-20% are public sector organisations and 0-5% private consumers.
Innovation:	The business reports no product innovations in the last two years, but does report process innovations (new to the firm – developed in house and as a constant endeavour) and administrative innovations (new to the firm – developed in house and again, as a constant endeavour). Innovation is generally described as incremental improvements to the Company's own products and services and are said generally to comprise 'discovery-style' initiatives. The Company indicated that innovation was more usually the outcome of strategies and plans and generally 'market led/pull' by nature. The Company reported that it had recently (in the last two years) invested in: the acquisition of machinery and equipment, and design functions.
Quality Accreditation:	The Company indicated that it had secured ISO 9000 accreditation.

Application of ICT:	The Company has established a web-site featuring 'brochure-ware'.
Intellectual Assets & IPR Protection:	The Company accords a high value to copyright and confidentiality agreements but regards patent protection, the registration of trademarks and pay and reward strategies (as a means to protecting/retaining intellectual assets) as unimportant.
Business Support:	The Company reports that it has received public sector financial support
Views on Incubator Services:	N/A

Company Name:	Pure Value Systems
Date Founded:	2003
About the Business:	IT asset management services. Managed network services, Second user computer equipment.
About the Founders:	N/A
Number of Employees:	3 FTEs
Turnover:	£150,000
Customer Profile:	0-5% of business sales are international, 91-100% located in the UK (the North East). Private sector businesses account for 41-50% of customers, 11-20% public sector organisations and 21-30% private consumers.
Innovation:	The business reports product, process and administrative innovations (new to the firm) as constant and ongoing. Product innovations were reported as developed by other businesses or institutions and then implemented by the Company and credited with making 'very significant' contributions to extending the Company's range of goods and services, opening new markets and increasing market share, and improving the quality of products and services. Innovation is generally described as incremental improvements to the Company's own products and services and are said generally to comprise 'market led/pull' and more usually the outcome of strategies and plans. Further, the Company indicated that innovation was often prompted by determinations that products or services were not operating as they should and/or the endeavour of one or more 'energetic' individuals.

	The Company reported that it had recently (in the last two years) invested in: the acquisition of machinery and equipment, external knowledge, training and marketing.
Quality Accreditation:	No.
Application of ICT:	The Company has established a web-site featuring 'brochure-ware' and functions enabling customers to place orders and make payment, and support business to business transactions (e.g. file-sharing). The Company also operates an intranet and utilises other advanced ICT applications.
Intellectual Assets & IPR Protection:	The Company accords a relatively high value to patent protection, copyright and the registration of trademarks but more so confidentiality agreements and pay and reward strategies (as a means to protecting/retaining intellectual assets).
Business Support:	The Company reports that it has not received public sector business support in the last two years (other than NEBIC services).
Views on Incubator Services:	N/A

Appendix 3

NEBIC Tenant Profile

1 Stop Property Shop	Property developer for but/to let
21 Degrees Ltd	Air conditioning design and installation
3K Design	A range of multi-media techniques for presentational and promotional purposes
A & C Coldrooms Ltd	Refrigeration
ADIPS	To fulfil the need of an auditable scheme to ensure the correct safety certification of passenger carrying amusement rides
ABFAD Ltd	Industrial Access techniques for high rise structures and buildings
Activaeon Ltd (Techtonik Ltd)	Computer network services and IT consultancy, web based applications on secure networks
Air Vent Systems	Smoke ventilation specialists
Alter Ego Print & Design (Be Invited)	Offer services built around the concept of digital design production
Anderson Business College	Training provider of management development programmes
A-Point Construction Ltd	Building renovation
Apollo Medical Systems Ltd	Software for NHS applications (Clinical and admin)
Appcon Ltd	Specialists in purpose built machinery
APS Vision Ltd	Design and manufacture of industrial vision systems
Aqualine (Coatings) Ltd	Development of water based coatings for anti graffiti purposes

Arch Automation Ltd	Electrical Engineering
Ashley House plc	Design, develop and project manage construction of surgery premises
Assessment North East Ltd	To provide IIP assessment centre for the North East
AT Leisure	Leisure industry based consultancy specialising in pub and small hotel estates
Aurora Design	Engineering design and consultancy
Autoview (UK) Ltd	Software products for automotive retailers
Ayton Financial Management	Financial advice encompassing all of the regulated market place along with mortgages and general insurance
B & C E Benefit Schemes	Not for profit benefit schemes and financial services for the UK construction industry
Baltic Enterprises Ltd	Importing painted glassware from Latvia
Benchmark High Design Ltd	Design and development services including pattern making, mould manufacture, vacuum forming and prototype manufacture
Bond CRM	Customer relationship management software
Bsupplied Ltd	Business Management/Retail Consultancy
Buhle Roche Ltd	Technical consultancy in the environmental sector
Business Link	Business Link
Cabletec Ltd	Design, supply and installation of electrical floor warming systems. Provision of safe, hidden heating for nurseries, residential carehomes, etc

CADUNITS	Provide training and support for the UNIX and CAD/CAM marketplace
Captivu Ltd	Advertising screens for GP and Dental waiting rooms. Build, install and operate systems – selling advertising space to local companies.
Care at Home (Wearside) Ltd	Community Care – delivering care to clients in their own homes
Carol Beattie	Supporting companies to achieve the IiP standard
CEDREC Information Systems	Publishers of environmental legislation in electronic form (CD ROM)
CIA Training	Customised Computer Training
Clementine Restaurant	Restaurant, take away and catering service
Cleveland Automation 2000	Electrical, instrumentation and control engineers operating in a 'niche' market specialising in environmental protection services to the industrial water consumer industry
Complement Genomics	Genetic testing company offering paternity tests (dadcheck.com) and unique gifts (DesigNA.uk.com)
Cord8 Ltd	Genetic testing company
Cortel Ltd	Communications – landline, mobile and data communications solutions.
Current Thinking	Provide product design consultancy and DDA related product manufacture
Cyber Law Services	Help for businesses with on-line presence or use e-communication systems to ensure they meet legal and regulatory requirements
DATUM	Land development consultancy

Davison Woods	Design and development services including pattern making, mould manufacture, vacuum forming and prototype manufacture
DESCO	Mechanical and Electrical Building Services Consultant Engineers
Design and Technical Services	Provision of architectural design services utilising CAD technologies
Dhrystones Ltd	Technology based (ICT) business improvement services
Direct Car Parts	E-commerce retail of car accessories and entertainment/security products
Discount Vehicle Lettering Co (DVLC)	Specialist sign-makers to the motor industry (design and fit vinyl graphics and lettering for car dealers in the UK)
Double Maxim Beer Company	Beer manufacture and distributor
DSA Building Performance Ltd	Helping individuals, teams and organisations improve their performance and results
E B C (Education Business Connections) Ltd	Education
EPD Multi Media Limited	CD Rom production and multimedia and marketing
East Coast Complete Cleaning	Cleaning Contractors
E-Cat Web Design /Printing	Web design, database solutions, graphic design and digital printing (business stationery and promotional material). Providing solutions for small business across a range of media focussing on delivering a fast, efficient and high quality service

Edect/Images	Image Management Systems, Photography Services, Online Stock Image Services. Listed on the Business Link National Register of Accredited Service Providers. E commerce web development, web site audits for DDA and EEC compliance, search engine optimisation and submission services. Listed on the Business Link National Register of Accredited Service Providers. Web usability and accessibility services, creation of DDA compliant web-sites. eMarketing and eConsultancy services, IT audits and Networking Services. . Listed on the Business Link National Register of Accredited Service Providers.
eGasStation Europe Ltd	Provision of an e-business technological solution for fuel wetstock to the petrol retail industry
Electrical Testing/Training Services Ltd	Specialising in testing of premises, portable appliance testing, consultancy and training
EMS Europe Ltd	Environmental consultancy specialising in customer based environmental services
Environmental Measurements Ltd	Manufacturers of meteorological instrumentation
Envirorental (Products) Ltd	Odour and bacterial removal by the use of ozone generation and UVC
Eomac UK Ltd	Acoustic wall design, manufacture and installation
F M S Services Ltd	Air con/heating engineers
F S Design Ltd	Automotive design and development
Fearsome Engine Ltd	Digital environment design. Browser based software design.
Financial Solutions N E (Zurich)	Mortgage advice
Fleet Services North East	Tachograph analysis for hauliers
For Sale Sign Analysis Ltd	Logistics business

Global Certification (Northern) Ltd	Quality Certification
Grace House Sunderland	Charity for children's hospice
H A B I T Ltd	Training providers for work based learning
Heat Trace (UK) Ltd	Heat tracing specialists
Henderson Business Development Ltd	Business development consultancy specialising in finance, start-up and owner manager training
Hi-Tech Seals and Polymers Ltd	Suppliers of hydraulic and pneumatic seals, gaskets, o rings and engineered plastic parts
I S Squared (Tricon Group)	Offering a wide range of statistical support to major companies
Images/Edect	Digital imaging, retouching, manipulation and creative output – Business and market intelligence services
Ingleside Childrens Home (Protect and Care)	Software development of childcare sector
iNotion Ltd	Software re-seller
Into-Home Design Ltd	Design and sale of home and multimedia storage furniture from Far East manufacturing sources
IQ Management Systems	Delivers training and consultancy in quality, safety and the environment
Jadnet Designs	Internet based t-shirt retailer, where the client designs their own t-shirt using software from the web-site
JEB Contractors	The design and manufacture of electrical control panels, both conventional and micro-processor types
John Anderson	-
KD Systems	Office Refurbishment

Klass Acts	Entertainment Agency for the provision of club acts, discos and children's entertainment
Lesley Jones Ltd	Costumary manufacture for young people
Lomax Associates	Business and management training. Specialist trainer/assessors to gas industry to recognised national standards.
LTP 2000 Ltd t/a Language Training Partnership	To provide language training and translation services to individuals and companies alike
Marine Response Ltd	Claims handling intermediary representing the interests of insured shipowners and their marine liability insurers
Maxim Cleaning Services Ltd	Specialist cleaning company
Media Mint Ltd (Colours)	Internet and new media specialist
MediaProm (Abstract Ltd 6535)	Multi media and telecommunications company
Meridian Marketing Ltd	Marketing Company
Micro Image Document Systems	Transferring document images onto CDRom and associated retrieval software
Multilayer	Provision of accelerated dialup/WiFi/GPRS users, in addition to IT support/consultancy
N A Consultants (NAC) N A Concepts (NAC) N A Compete (NAC)	The design and development of new productivity materials. Acting as a consultant for DTI, One NE in support of publicly funded productivity initiatives. Commercial contracts with UK Blue Chip
Net Effects	Provision of internet related services

Neutronic Technologies Ltd	Electronic repair services – PCB repairs, robotics and plc
North East Product Development Ltd	Designing essential innovative modern day products, equipment hire and employment pack for employment market
Northern Construction Ltd	Leading provider of a range of solutions to the construction industry as well as construction solutions to the general public
Northern Defence Industries	Northern Defence Industries (NDI) is an organisation that assists its members to develop and grow their businesses in the global defence and aerospace sector. Provides networking opportunities, promotional support, customer contact, technology transfer and cluster development
Northern Photos LMPA LBIPP	Undertake all photography, weddings and portraits, commercial and PR, fashion photography, insurance.
Novus Supply Teacher Recruitment Ltd	Supply teacher recruitment
Onyx Scientific	Chemical Services to the Pharmaceutical Industry
Optimum Control Solutions	Designing and supplying electronic based management and monitoring systems for manufacturing process plants
Orchard Design	Internet, website design and build. Advertising and designing
Our Mag	Community magazine delivering to 2000 homes
P & A Irwin Interiors	Interior Design Consultancy

PDQ Communications	Manufacture and sell full range of miniature switches used in hearing aids and telephone headset amplifiers
Pareto UK	Consultancy and training in management, human resource development, European funding
PEAK	Specialists in coaching skills training and consulting
PHASOR	Vision equipment
Pneumatics Northern	Supply of pneumatics components to industry of a 24 hour guaranteed delivery. Also make up and supply sub-assemblies
Press Ahead Ltd	Media, marketing and communications
Pure Value Systems	IT asset management services. Managed network services. Second user computer equipment.
Rainbow International	Claims management service for the major insurance companies. Carry out restoration after fire and flood and offer one stop service for customers
Reflex UK	Project manage shop front systems
Regina Rose Ltd	Decorative Textile Creations
Riverscape Ltd	Computer Systems Consultants
S I S Ltd	IT Consultants
Safecall	Confidential reporting line and Corporate investigations service
Salamander pumps	Manufacture and distribute shower booster pumps
Scandinavian Building Products Ltd	Importer of Swedish building products

Secon Solar Ltd	Development of solar (thermal) components and systems
SERU Consultancy	Economic research
SGO Decorative Glass	Provider of specialist service in overlaying glass with traditional designs. Now involved in solar filter films and shatterproof film
Siblings Nursery	All day nursery
Skillspath Ltd	Education software developers
Skinner Marine	Design, modification and supply of a range of engineering equipment, especially in ship building industry
Smart Logistics	Comprehensive logistics service
Souter Sports Ltd	High quality sports surface construction and maintenance. Consultancy advice and technical support within the sportsground industry
Spirit of Trading	Importing wine
Sprint Finish	Print finishing service to printing industry
SUN FM	Radio Station
Sunderland Health Authority	North Primary Group
Superior Network Management Ltd	Telecommunications solutions for businesses
Support Services Solutions Ltd	Delivers NHS training
TPM (Tailored Property Management)	Property management and development. A complete turnkey service for the private rental sector

TWEBLO	Funding body for work related learning in schools
Teacoco Ltd	Importer and distributor of tea and coffee and associated products. Developing a franchise network
Techtonik Ltd (Activaeon Ltd)	Computer network services and IT consultancy, web based applications on secure networks
Techtronics	To repair, maintain and design electronic controls for eg mining industry
The Business Cause	Integrated management system and business support
Total Maintenance Solutions (Adv. Indust. Rewinds)	Supporting manufacturing companies with planning maintenance programmes
Treepax	Training, Consultancy, and Workshops for Idea Generation and Innovation
Tricon Group (IS Squared)	Offer a wide range of statistical support to major companies
TRS North East Ltd	Recruitment Agency
Two Can Design	Graphic Design and Advertising
VisiTech International	Suppliers of imaging instruments for life-science research
Watermark Games (Purely Creative)	Design and production of mathematical based print (promotional games)
Xentec Ltd	Logistics business

SJIC Tenant Profile

1...Ltd	Providers of technology solutions under licence, based on proprietary ceramic actuators and digital signal processing.
2i Design	Graphic design consultants
3E Europe	3E specialises in software applications and information exchange services for business management
AAR International	AAR provides high-quality aircraft and engine parts supporting a broad range of commercial, regional and military operators and offers a full range of related parts services, including just-in-time delivery, parts exchange and comprehensive inventory management programs. AAR specializes in airframe maintenance, consisting of light-to-heavy airframe maintenance checks and aircraft modifications and upgrades. Our maintenance, repair and overhaul (MRO) capabilities also include landing gear systems, composite structures, avionics, instruments, pneumatics, hydraulics, electronics and fuel controls. AAR designs and manufactures a wide variety of customized in-aircraft cargo loading systems and interior and exterior composite structures for the aviation and transportation industries. AAR also manufactures and repairs specialized mobility products that include custom pallets, containers and shelters used by the U.S. government and its allies for tactical deployment activities. AAR provides assistance in remarketing aircraft and engines buys. AAR also sells and leases a wide variety of commercial aircraft and jet engines and provides fleet management and technical advisory services, including records management and storage maintenance.

Accipia	Accipia are an IT consultancy and software development group focussed on the Telecoms marketplace with particular expertise in revenue assurance and the Geneva® rating and billing system from Convergys™.
AGM Partners	Financial Services Consultancy specialising in Corporate taxation; VAT and Customs & Excise Duties; Tax advice for individuals; Corporate finance; Corporate advice; Internal audit; Corporate Governance; Shareholder management
Asymptote Ltd	Specialists in controlling solidification - freezing and crystallisation – and licensing its process technology, providing consultancy, and selling its cryopreservation and freezing products.
AVIT Research Ltd	Today AVIT Research has a range of Video Control products for Sony's ***Control-S*** and ***Infra-Red***, Panasonic's ***Control-M*** and the well-established Sony ***Control-L.*** protocols.
Azuro	Electronic design automation (EDA) software developer enabling electronics companies around the world to build semiconductor chips that use significantly less power than ever before. Azuro is headquartered in Mountain View, CA with a development office in Cambridge, UK.
Barker Bretell	Intellectual property protection specialists
Bensasson and Chalmers Ltd	Software developer (Logistics)
Bridge Partners	Bridge Partners are an information and communications technology (ICT) support services company with offices in Cambridge and London.
C3 Ltd	C3 supplies communications platforms for all 'IVR' and multimedia requirements.

CacheLogic	CacheLogic is a technology company that provides a suite of complementary products that deliver traffic management and network intelligence solutions for the Internet Service Provider and Telecommunications sectors. CacheLogic is a privately held, well funded company headquartered in Cambridge, England with sales coverage in North America, Latin America, Europe and Asia Pacific.
Cambridge Marketing College Ltd	Marketing Study Centre founded in 1991
Cambridge Network Ltd	The Cambridge Network is a membership organisation of like minded people from business and academia enabling them to work together together and leverage their collective resources in new ways for the benefit of technology-enabled enterprise and adjacent stakeholders in the Cambridge region.
Chemical Computing Group	Develops and supplies drug discovery software tools to computational and medicinal chemists, and biologists. Supports High Throughput Discovery; Protein Modeling and 3D Bioinformatics; Molecular Modeling and Simulation; and Methodology Development and Deployment.
China Business Solutions Ltd	China Business Solutions provides a one-stop consulting and research service to British companies doing or wishing to do business in China.
China-UK Innovation Park	CIPUK (established as part of the cooperation plan agreed by government ministers of both countries, aimed at strengthening the collaborative links between China and UK) provides incubation and consulting services to assist Chinese enterprises investing and doing business in the UK and also helps UK companies developing business with China. Head office of the company is in Cambridge and the company has delegation offices and strategic partners in Beijing, Shanghai, Guangzhou, Chengdu, Xian and other cities in China.

cintelliq Ltd	cintelliq delivers a range of research and information services to organisations with an interest in the development of technologies and applications across the whole of the organic semiconductor industry.
Citylife Ltd	A Charity dedicated to tackling the issues of unemployment.
Commsonic	Commsonic is a design services company specialising in the development of ASIC, FPGA, DSP and board-level sub-systems for applications in wireless and wireline communications
CovalAb UK Ltd	Manufacturer and supplier of polyclonal and monoclonal antibodies and synthetic peptides.
Crescendo	
Datanomic	Software company.
Drug Testing Programme Management Ltd	Provides a range of drug screens
East of England Churches Network	The East of England Churches' Network is the churches ecumenical liaison point with regional government in the East of England.
Elements PR	They established Elements in 2000, to provide high quality, PR strategies, planning and implementation.
ERBI	ERBI is the Membership-based biotechnology business network for the cluster concerned with the global promotion of Member companies and technologies.
ET Capital Ltd	ETCapital Limited was set up in 1992 as an investor in high growth businesses based in southern England. Since 1998,

Gyrodata Drillling Automation Ltd	Gyrodata was formed in 1980 with funding from several major oil companies who had a critical need for more precise wellbore survey technology. By 1982, using the same sensors in advanced aerospace guidance systems, Gyrodata had developed a means to increase survey accuracy tenfold. Gyrodata is now a leading supplier of precision wellbore survey services to the energy, mining, environmental and construction industries. The company has over 300 employees and offices throughout the world
Image Semantics	Image Semantics is a global developer of mobile, interactive, multimedia applications and services powering: 'Value Added Messaging'; 'Sport and Media Publishing'; and 'Personalisation and Entertainment'.
Jobstream Group Plc	Jobstream Group plc is a provider of software systems and associated consultancy services to the off-shore financial services industry.
Landmark EAME Ltd	Landmark, a Halliburton company, is a supplier of services and software for the upstream oil and gas industry. The company's solutions span exploration, production, drilling, business decision analysis and data management, in addition to a broad range of consulting services that enable customers to optimize their technical, business and decision processes.
LI-COR Biosciences UK Ltd	Integrated Instrument Systems for Biotechnology and Environmental Research
Linguamatics Ltd	Developer of Interactive Information Extraction - new text mining and search technology And The intelligent Dialogue Manager.
M-spatial Ltd	Specialises in the application of 'Spatial Intelligence' (what's around me?, where is it?, how do I get there?) within mobile portals and their associated content services.

Media Managers	Media Managers specialises in advertising campaign planning and media buying, sales and marketing consultancy, sponsorship and promotions.
Nemerix	A fabless semiconductor company with unique intellectual property in high-performance, ultra low power, RF, baseband and software for global positioning systems (GPS) solutions.
Netconnect Ltd	Netstore Security Services is a division of Netstore PLC and was formerly known as NetConnect. Headquartered in Bracknell, Berkshire, Netstore are a leading provider of IT Outsourcing and managed services with market leadership in the hosting of financial management and other back office systems
Northrop Grumman IT Europe	Originally founded in 1992 the company has, since 1998, been a wholly-owned subsidiary of the Northrop Grumman Corporation. Northrop Grumman Mission Systems Europe Ltd specialises in the development of a Common Operating Environment (COE) for C4I systems.
Open Objects Software Ltd	Supplier of search-based solutions for web, intranet and extranet, including corporate use and e-Government solutions.
Owlstone	Chemical detection technology
Praxis	Praxis is a national training programme aimed at technology transfer professionals working in universities, research institutions and industry. The Praxis programme features a range of courses led by experts from universities, industry and government, featuring a mix of seminars, interactive workshops and case studies.
Property Search Group	Property Conveyancers
Qi3	Qi3 is a business consultancy, providing sales, marketing and business development support to technology enterprises and government.

Re5ult	RE5ULT is an innovative bespoke information service. Our customers enjoy immediate access to any information, at any time from any place. Clients send questions to RE5ULT (via SMS, email or online) and receive accurate and timely answers in response.
Red Gate Software	Software Developers
SavaJe	Developers of SavaJe OS -an open standards-based, Java™ platform for mobile phones
Saviso Group Ltd	Saviso is a technology consulting, application development and solution design team focused on the needs of the Internet infrastructure market
Scientia Ltd	Scientia Ltd. is a software engineering company that develops and supplies knowledge-based solutions for resource scheduling and management.
Skills Link	Cambridge SkillsTap is a not for profit company limited by guarantee and its Members are businesses which supply portfolio working. The employees of these Members are Cambridge SkillsTap's Associates and are typically independent consultants, portfolio workers and others who choose not to be tied to full time employment
Splashpower	Developers of unifying wireless power solution for electronic devices (e.g. mobile phones).
START International	Operators of managed workspace/incubators as part of a joint venture with SJIC
Syplex Ltd	IT consultancy
Transware	Designers of multilingual webmail technology.
ver-tec	Ver-tec Security Systems is a UK-based Authentication Security Solutions company, supporting customers in industry and government through the creation, application and exploitation of advanced technologies.

Wax Info Ltd	Active Library content management software
Yeoman Navigation Systems	Part of Trafficmaster - an established technology company, focusing on satellite navigation and digital traffic information.
Zentian	Zentian is developing a speech recognition accelerator to enable dictation of email and SMS messages on mobile devices. The accelerator uses a patented architecture to efficiently perform the search stage of the recognition process.
Zeus Technology	Developers of application traffic management software.