

**Finance Investor Versus Corporate
Management:
Who Defines Technology Strategy?**

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Doctor of Business Administration

by

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Dedication

I would like to dedicate my thesis to my family who have given me so much support throughout the years of research. They were never too tired to listen to me when I needed to talk about the difficulties I was experiencing with the research. They were always encouraging and kept me going to the finishing line. The part-time DBA was the longest and most demanding project I have ever undertaken in my life. The experience was very fulfilling and without doubt a positive input to my self-development process.

Foremost, I would like to dedicate this work to my father who was fighting for his life during 2010. I had seriously begun to consider ending my research project due to issues in my professional and private life that were almost entirely consuming my time and concentration. While he was in hospital we made a pact that I would finish my project and he would conquer his disease. He recovered well until the beginning of November 2010, by which time I had made a fresh start with more will and discipline to finish my DBA.

Unfortunately he died suddenly on December 09, 2010 in the morning, while I was on a business trip to France. My father kept his promise to recover, even if it was not lasting for long. I trust that with this thesis, my promise is kept as well. The strong support of family and friends is a key element to succeed, not only in daily life, but also in the context of such research project.

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Abstract

Background

The contours of today's corporate landscape are strongly shaped by finance investors who own businesses, either in part or fully. This thesis analyses the processes of cooperation and interaction between businesses and finance investors regarding technology strategy. In addition to the question of the direct influence finance investors might have on technology strategy, indirect influences are also investigated. An evaluation of the finance investors' capabilities and responsibilities is carried out in parallel to understand what "real potential" investors have to influence the technology strategy of companies in their portfolio. This work addresses a gap in current existing literature and research in this area as the elements of direct involvement of investors in technology strategy of firms they own are not yet studied in depth.

Methodology

A purely qualitative approach of case study research was chosen as the method most suitable for obtaining the desired insights. A pilot project involving two cases, confirmed the efficacy of the semi-structured questionnaire for conducting in-depth interviews. A further 12 case studies were carried out with companies that were selected following defined criteria to ensure the reproducibility of results. The final work has a fundament of 14 cases, consisting of 43 interviews with finance investors and portfolio company representatives.

Conclusion

Finance investors consider the technology strategy of their portfolio companies to be vital as it impacts the market value of the company and financial results. Besides the financial impact of technology strategy, finance investors show no specific interest in technology strategy nor are they likely to have major expertise in this area. Responsibility for driving technology strategy is clearly in the hands of the corporate managers. But finance investors do exert strong

indirect influence by controlling and steering budgets, investments, etc. and also through their consultancy role in the organisational development process.

Chapter 1 Introduction

This chapter outlines the motivation in selecting this subject with its importance and implications for specific audiences. In addition, the context of the study in the business landscape and its specific focus are explained, familiarising the reader with the situation that is the groundwork for the study. The chapter closes with a roadmap of the work to guide the reader through the thesis up to the discussion of the results and the conclusions.

1.1 Motivation and implications

This study aims to add to the existing fundament of scientific analysis on the interaction of investment funds with the companies in their portfolio. The underlying motivation for the study is the lack of data and information on the extent to which finance investors influence the companies in their portfolios. This includes information about capabilities and expertise of investment funds including interaction channels and mechanisms. Shareholding and non-shareholding stakeholders' interaction with corporations is well-described today on the macro perspective through various scientific studies and analyses (Surroca et al., 2013). But still widely unknown are processes of interaction on the micro level and the real cause and effect flows, particularly for non-public exchanges between stakeholders and companies (David et al., 2009, Surroca and Tribò, 2008, Sarkar, 2008).

This thesis shall close this gap at wide extend and stimulate further research in this area. The constellation with the least research in interaction processes and mechanisms, but one that plays an important role in the current corporate landscape (Greenwood and Schor, 2009), is the interaction of powerful finance investors with the corporations they own. There are articles available about investor-driven change and transformation in prominent individual companies, but none is written at a level of detail that describes the complete chain of stakeholder interaction (Burnett et al., 2012). So there are a lot of unknowns

requiring answers, answers which could then be used as a tool in overcoming the aforementioned issues and processes in corporations (Mishina et al., 2012).

The ultimate question left unanswered by the existing literature is how do finance investors influence the technology strategy of the firms they own. While this area is of utmost importance for companies in the long-term and perceived as such by the company employees, it is seen as less important for the short-term evolution and thus off the radar for institutional investors (David et al., 2007). Investigating the role finance investors take in the technology strategy for the companies they own serves as the general starting point, but one that opens up a more specific analysis. A major component of academic work to be done is establishing what the channels of communication are between active stakeholders as well as the mechanisms and processes of interaction.

Taking into consideration not only the investors but also all the stakeholders' individual capabilities and interests is a fundamental milestone in understanding each individual's potential and actual impact on corporate technology strategy (Hoskisson et al., 2004). The existing secondary literature can produce only a superficial view of what is actually going on in corporations in terms of investor involvement in this specific area. As a matter of fact, collecting new data is the most critical aspect to get the necessary insights into the stakeholder cooperation processes (Chari et al., 2008). Having defined the organisational framework, refining the research questions in an iterative process equals the identification of the missing piece in a puzzle but ensures that the focus is set correctly.

1.2 Audience benefiting from new insights from this study

The first paragraph has already established that this research is of interest for the academic audience, not only researchers dealing with technology but also for those specialising in shareholder activism, for instance, or stakeholder activism, organisational learning, innovation, etc. The processes of interaction

are very similar for a variety of issues (Klein and Zur, 2009a), thus establishing the process of defining technology strategy is a good starting point for launching in-depth research in other areas. In addition, the results of this work will help people working in organisations with finance investor involvement to better understand the mechanisms and processes of influence. It brings more transparency to the positive, but also the potentially negative points in the dynamic and replaces theory not based in fact, or guesswork and assumptions, with empirical data (Mishina et al., 2012).

For investors it provides valuable insights, as well as an objective outsider's view into their actions and involvement. Ultimately the research was aimed at giving the broad public insight into an area, which until now has been considered as a black box with very limited information on what is going on in inside. Clarification of the interdependencies would expose the happenings on the micro-level in organisations with strong stakeholder involvement. This in turn will create a better awareness for hidden agendas or cognitive dissonances and can be used to promote the buy-in of all relevant stakeholders in specific actions. If the complex structures and interactions are better understood by the key players, then each individual can act or react in a way that eliminates or at least reduces misunderstanding or frustration benefiting the overall target – that is – a functional and efficient corporation.

Beyond the aforementioned contribution, the outcomes of the thesis will also deliver valuable new insights for regulatory and controlling institutions. Understanding what is going on in closed-door sessions is vital if rules and regulations are to be created which are then respected. If advantages for a small group of people result in disadvantages for other stakeholders then countermeasures are needed. However, the basis for this is a comprehensive understanding of the overall situation, the actors and the processes, which can as of today not be gained from existing data. In the following, the general background to the subject of this thesis and the significance of the investment

industry are briefly explained to provide a common starting point for the reader and writer.

1.3 Context in the business landscape and focus of the study

For many start-up businesses access to funding from external shareholders is today imperative to enable them to start walking on their own feet (Stroemsten and Waluszewski, 2012). Investment in state-of-the-art equipment and infrastructure quickly exceeds the available budget and requires financial support (Richtel, 1998). External funding can in the same way be important for mature businesses to pursue growth strategies, which are beyond their individual limits. Global expansion and product proliferation require intensive investment that is often difficult to acquire from banks due to insufficient physical assets and property. Many ideas and opportunities would have remained unrealised and unused without the involvement of external shareholders (Baum and Silverman, 2004).

Adventurous and rational external shareholders are often willing to help out by filling the financing gaps in a wide range of regions, markets and business segments. As a consequence, the number of companies fully or partly owned by finance investors is steadily increasing (Davis and Thompson, 1994, Chou and Hardin Iii, 2012). In the second quarter of 2010, global ownership of investment funds in companies exceeded 17 trillion Euros (EFAMA, 2010). This figure confirms that the number of companies all over the world in the ownership of finance investors is highly significant (Useem, 1996, Davis and Thompson, 1994). Subsequently, the role that the finance investment industry plays in the global economy is increasingly important (Ferreira and Matos, 2008, Tihanyi et al., 2003, Kochhar and David, 1996).

In this sense current literature concludes that institutional shareholders actively influence the actions, decisions and processes in the businesses in which they invest their money (Nisar, 2005, David et al., 2001, Zahra et al., 1995, Wright et

al., 2002). It is surprising in consideration of these facts and figures, but detailed data about direct interaction between investors and corporate management teams is still very rare. One of the reasons is that historically, meetings between CEOs and asset managers took place behind closed doors. Any official announcement about the subject matter or outcome of such meetings has been the exception rather than the rule. The situation is gradually changing due to a variety of reasons.

A major factor in the promotion of transparency is that investors today frequently use annual general meetings to pass on criticism to their portfolio company's top management (Romano, 2000). The presence of the media and other shareholders at annual meetings then results in a leverage effect and subsequently to increased pressure on the managers (Karpoff, 2001). Nowadays, when a member of this formerly closed circle wants to express their subjective opinion to the broad public, they can easily find a channel to do so. This is because increasing investor activity and their influence on individual enterprises and the economy in general attracts a great deal of interest. In the German media, this became a hot topic around 2005, when politicians blamed finance investors for only being interested in maximising profit and that they were not considering the negative effects on companies in the long term (VDI-Nachrichten/JWC, 2007).

Around the same time, print and online medias were quick to pick up on the story of finance investors attempting to buy shares in a certain German company. In such cases, the investors were often labelled "Heuschrecken" (= German for locusts, a metaphor inspired by a swarm of locusts used by the German politician Franz Müntefering during a speech on November 22nd, 2004) (VDI-Nachrichten/ps, 2006). The press picked up cuts in jobs or closure of factories without much footage being given to the details or consideration given to the underlying reasons. Most articles on this subject were published by the yellow press and were negative. It was and still is often forgotten or ignored

that the root cause for such cuts often was that the former management had not been fast enough in reacting to a changing environment.

The reality is that no stakeholder acts purely negatively per se, but the reasons for particular courses of action are complex and the outcome often difficult to predict. One of the founders of the US-Investment Company KKR (Kohlberg, Kravis, Roberts & Co), Mr. Henry Kravis, said at the 2006 Super Return congress in Frankfurt that significant and painful restructuring is sometimes inevitable for firms to keep them fit for long-term survival in the market or to bring them back on track. Many finance investors have extensive expertise and experience in analysing business situations and defining suitable action. When severe action is taken after they get on board a firm, they are often perceived as merely being interested in firing people, while in fact stagnation would have led to the collapse of the firm.

What also needs to be considered is that organisational changes also generate workplaces. Contrary to anecdotal evidence it has been found that the overall number of newly created jobs in companies with finance investor involvement is higher than the number of job cuts (Brien, 2005). The study "Employment Contribution of Private Equity and Venture Capital in Europe" confirms that finance investors created one million new workplaces in the years 2000 to 2004, which is eight times the average growth rate of the 25 EU states in the same time period (Brien, 2006). This fact indicates that investment companies do not have a purely negative impact on the economy but that they do not adequately communicate the positive effects of their activities, otherwise the image of finance investors would be much more diversified (Clark et al., 2004).

When companies are not willing or incapable of kicking-off necessary organisational and technological changes, they lose ground to the benefit of their competitors. The gut feeling and instinct of seasoned senior managers are excellent when complementary to rational comparative future oriented objective

analysis, but standalone they are mostly insufficient and can bring businesses to the edge of a precipice. Investors see and use such stagnant tendencies as an opportunity to re-adjust company performance and value. The following example shows, in contrast, that the involvement of finance investors in the definition of a future technology strategy for a business is often but not always positive.

In this case, technological change and subsequent focus on one area ultimately led to the fall of GEC (General Electric Company). For a long time GEC was one of Britain's biggest and best known manufacturing companies. In 1999 GEC sold its defence business to BAe (British Aerospace) and instigated a major reorganisation involving finance investors in order to concentrate fully on telecommunication technology. The "new" business was named Marconi plc. to reflect their new strategic direction, which focused on communication technology. During and after the reorganisation Marconi acquired several companies in the telecommunications sector. It was the peak of the "dot com boom" and Marconi paid a high price for most of its acquisitions.

The finance investors supported and pushed the acquisition and telecommunication-focused approach, as at that time telecommunication was comparable with the gold rush decades before (Leach, 2004). In 2001, the burst of the "dot com bubble" brought Marconi to its knees. The shares lost more than 90% of their value. At the time it was clear that the technology and market strategy decision made in 1999 had had disastrous consequences for the company and the shareholders. On January 24, 2006 the takeover of Marconi's telecommunications business by the competitor Ericsson was officially announced.

"All conditions for Ericsson (NASDAQ: ERICY) to acquire key assets of Marconi Corporation plc's telecommunications business have been

fulfilled and the transaction was completed on January 23, 2006.”
(Ericsson-Media-Relations, 2006)

This is an extreme, but excellent example illustrating how dramatic and severe change and uncertainty can negatively impact enterprises within a short period of time. The decisive factor in the Marconi case was the downturn of the telecommunications sector and the decision to streamline and readjust market focus and strategy. Of relevance for this thesis is the involvement of active shareholders in the business planning and strategy definition process. It is important to keep in mind that for shareholders with a diversified portfolio the consequences of a failed strategy are without doubt painful, but not to the same degree as for the business and its employees. The involvement of active shareholders can be the lever needed to reconstruct a company and prepare it for the next decades.

The inherent risk however can also mean the collapse of a firm. The case proves that being adaptive is key to survival in the market or in being able to take advantage of new conditions. The ideal world, in which the survival and success of a firm is the result of an isolated strategy and roadmap defined by the management, does not exist. In the real world the situation is much more complex and a wrong or non-existent strategy or plan can be overcompensated by other effects (Kay, 2010). Clarifying the role that institutional investors play in the area of learning and adaptation in the firms they own is the overall goal of this work. Focus is directed to their influence and involvement in corporate technology and R&D as one of the crucial elements for the long-term survival and performance of a company (Cefis and Marsili, 2006).

A basic thing is to understand through which channels and with which frequency information is shared between investor and investee. A key question to be answered is, if and how much finance investors are interested in the technologies used by companies in their portfolio. Whether there is shareholder

involvement in the decision-making processes, the clarification of investors' capabilities and the justification for their involvement is another point requiring investigation in understanding the overall picture. It seems difficult, if not impossible, to steer a company in the right direction without access to comprehensive knowledge about markets, products, processes and other constraints.

Thus a clear understanding of the experience institutional shareholders have had and share openly is of utmost importance. The issues seem very basic. But due to the complexity of the investor / manager relationship and the meagre insider information available, they cannot be answered through pure figure analysis or by the existing literature. The fact that most of the currently available research about institutional shareholder activism with regards to technology is limited to quantitative analysis of annual reports or databases (Karpoff, 2001, Bhagal et al., 2008) was a major challenge for this work. The point is that public domain descriptive data is not always suitable for the analysis of whether investor influence triggers action, because it is potentially biased.

To avoid misinterpretation, each evaluation or measurement of influence must be comprehensively screened and all contributing factors analysed. What is going at the micro level between institutional shareholders and the corporate management is as yet widely unknown (Rehbein et al., 2004, Le et al., 2006). As such a key challenge is how to give adequate consideration to the complexity of the processes, including all parameters, stakeholders and areas of interaction. Only when this is done carefully can the outcome be reliable and scientifically valid. Detailed insight into how investors become involved after the shares of a firm have been bought requires in-depth analysis of the interaction process between the parties with direct input from both shareholder and corporation representatives.

Other researchers who have undertaken statistical analysis of the existing and publicly available data have also highlighted the necessity for further analysis in this area. This is the only way to understand if and how investor involvement directly affects evolutionary and organisational learning processes in corporations. Otherwise the processes and activities that led to the correlations found remain unknown (David et al., 2001, Shahzad and David, 2010). Analysis of the interaction between institutional investors and the corporations in which they have shares should close a gap in the current literature and knowledge base and focus on technology strategy. From a scientific perspective, if evaluation of cooperation is to be objective, it is vital to gain information from and about the direct interaction between the concerned parties. A detailed discussion and analysis follows in the next chapters.

1.4 Roadmap of the work

Chapter 1 begins with a concise discussion of the motivation for and the implications of the thesis, as well as the audience likely to benefit from the study results. It continues with an exploration of the cooperation between institutional investors and the companies in their portfolios. An example is given of the challenges of change and uncertainty and the need for evolutionary adaptation and learning. Understanding whether finance investors do play a role in those processes, especially in technology strategy and R&D, is the core focus of this work. In chapter 2 some relevant basic notions are defined. This is followed by a paragraph about the cooperation and interaction between investment funds and the companies in their portfolios.

The definition of evolutionary theory for this work and its relation to the research topic is elaborated in the first part of chapter 3. The existing literature about general or specific shareholder activism and corporate governance including the related theories is reviewed and discussed in the second part of chapter 3. Later in chapter 3, gaps in the scientific body of knowledge are identified and confirmed through discussion of the existing literature. The discussion

precipitates the research questions which are listed at the end of the chapter as part of the literature review conclusions. The most suitable research methodology, including a discussion of pros and cons, is defined and outlined in chapter 4.

In the same part of the thesis, the pilot project performed to test the methodology is described and the results and implications discussed. The outcome of the pilot study forms the basis for definition of the final project, which includes the derived improvements. In chapter 5, the results of the case studies are outlined following the flow of the semi-structured questionnaire and are displayed using one table for each analysis. Additional evidence collated during the interviews is described at the end of chapter 5. Critical discussion of the results, also in relation to the literature analysed during chapter 3, is dealt with in chapter 6. In this chapter the approach to attempt to close the scientific gap identified in chapter 3 is defined. The work closes with the conclusion and suggestions for further research in chapter 7.

Chapter 2 Definition of basic notions and information on the interaction between the main actors

This chapter starts with a paragraph defining some basic terms and notions used throughout the thesis. It is important that the reader and writer have the same understanding and interpretation of the terms used. It continues with a quick introduction to the dynamics of interaction between investment funds and the companies in their portfolios - for the reader who might not have extensive knowledge of this subject.

2.1 Definition of some relevant basic notions

Some basic terms and roles that are fundamental to the research topic require explicit specification, as some of them have been defined and interpreted in different ways in the existing literature (Albers and Gassmann, 2005). The definitions begin with technology strategy as the focus of the analysis, continue with the parties involved who are the institutional investors, their employees or partners, the fund managers, and the companies they own in part or full, the investees.

2.1.1 Technology strategy

A strategy is an action plan that is formed to achieve a specific target by utilising and controlling the available financial, physical and human resources (Harvard-Business-School, 2005). The internal initiatives of each individual company towards the generation of new or improved technologies are a key area (Metcalf, 2005, Burgelman et al., 2008, Le et al., 2006). Monitoring and evaluating the technologies developed and used by other companies and industries is vital in supporting internal decision-making processes. In most cases the driving factors are the personal experience of decision-makers and people involved (Hill and Westbrook, 1997). One of the most critical aspects of strategic planning is technology.

Technology describes the knowledge about and the application of crafts, methods, tools, techniques, systems and products of these things (Hanks, 2010). For this work, the focus is on the application and influence of technology in the areas of IT, processes and methods in production, products and materials. Technology is not a matter exclusively for high tech firms. It is relevant for most businesses in certain areas such as IT or production, (Reichert, 1994). To keep a certain market position the use of state-of-the-art technology is mandatory. Thus advances in technology have to be monitored closely to avoid losing ground to competitors. Technological change is typically the result of inventions and innovations that derive from continuous and incremental learning processes within each individual company and from outside (Pavitt, 2003).

Such changes can be very specific ones, e.g. a breakthrough in nano-technology that directly affects companies working in that sector. In the business environment, technological innovations play a major role in achieving or maintaining competitive advantage against other companies in the same area (Pegels and Thirumurthy, 1996). Surely, for businesses in different areas the significance of specific technological innovations is not equal but dependent on the area of activity and the product (Tell, 2000). To survive over time in a market, each company and the technology it uses and applies has to be competitive with other companies. The only other but even better option for long-term survival and growth is to have a competitive advantage, typically gained through taking a leading role in innovations.

As a pre-condition for taking a leading role, the decision makers in a company have to have access to product and process innovation. Secondly, they have to have an innovator's mindset (Rogers, 2003). People and companies with a so-called innovator's mindset are willing to take the risk of implementing or launching a new product, process or service before the majority of other people or companies would do it (Thomas, 1996). Knowing that the significant investment, which in most cases is required to push innovation forward, often

brings only a minimum of return due to the high risk and uncertainty involved (Coad and Rao, 2008). Uncertainty and unquantifiable risks are the biggest hurdles that people and organisations have to overcome when they are aiming for technological leadership.

When these conditions and mindset are not fulfilled, a company will never become a technology leader (Cohan and Unger, 2006). Clearly, technological leadership cannot be the target for each and every company. The key is to survive in the market and remain competitive. When the decision-makers want to minimise risk, uncertainty or investment, the optimal technology strategy can be i) to run everything as it is for a longer time or ii) to follow some innovators who have already tested the water successfully. A differentiation has to be made with respect to the market strategy, as for some markets like telecommunications leading-edge technology is key to playing a major role. For less technology affine markets it can be more effective to give minor priority to new technology. Clearly, market strategy correlates closely with technology strategy and predefines the requirement for certain skills, standards and equipment.

2.1.2 Institutional investors

In 1774, the Dutch merchant Adriaan van Ketwich formed the investment trust Eendragt Maakt Magt (transl. Unity Creates Strength) with the target of offering private investors diversification at reasonable cost. In the late 19th and the following 20th century, several investment funds were founded in the British Isles and in the USA due to the strong demand for such products in the investment market.¹ The market demand for investment funds in Germany, in contrast to the Anglo-Saxon region, was not significant until the mid 1990s.²

¹ The fact that the roots of funds are in Holland is often disregarded in the literature. The Foreign and Colonial Government Trust, which was founded in Scotland in 1868, is often falsely identified as the first mutual fund ROUWENHORST, K. G. (2004) The Origins of Mutual Funds. Yale ICF..

² In Germany the first fund product was created in 1950 by the investment

Even today, the basic principle of all funds is to pool money from a number of investors to buy any kind of securities (Teacher Reference Center, 2005). While securities can be in the form of a variety of assets (real estates, ships, companies), only those investments in corporations are of relevance to this thesis.

According to the 2009 3rd quarter report of the European Fund and Asset Management Association (EFAMA) about 10% of European funds are managed in Germany. That means, in numbers, 6,081 funds – of a total of 52,715 funds with an overall value of about 6.8 trillion Euro at the end of the 3rd quarter of 2009 (EFAMA, 2009). The enormous amount of money involved means the investment companies have to have excellent and professional employees on board to handle and manage the portfolios in a profitable and stable manner. There are large teams of analysts and assistants in the background, but actually the most important people are the ones who are in direct contact and who interact with the firms in which they have shares. They are the fund managers and in some cases specific members of the portfolio teams.

2.1.3 Fund managers

With the foundation of the mutual funds, a new kind of job was created, the fund manager. Besides the founders and/or owners of investment companies, these are the key people in the fund industry. They monitor and control on a day-to-day basis the performance of the companies in their portfolio, the market

company ADIG that had been founded one year earlier in 1949 DEMBOWSKI, A. (1999) *Profi-Handbuch Investmendifonds*, Bonn, Walhalla Verlag. From then on demand was stimulated by initial public offerings of companies like Deutsche Telekom AG or EM-TV, as well as by intensive advertising for newly founded discount brokers like Direktanlagebank and Consors VON ROSEN, R. (2001) *Aktienmärkte und Aktienkultur in Europa. Handbuch Europäischer Kapitalmarkt 2001*. Wiesbaden, Detlev Hummel/Rolf-E. Breuer. Nowadays it is no longer unusual for the general public to have shares in public companies or investment funds in their portfolio. Statistics prove that investment funds are well accepted these days.

situation as well as economic changes and trends (Bainbridge, 1995). Insights from these people are extremely rare and their time is highly valuable. Their income is strongly linked with their success. The algorithms according to which their financial compensation is defined are often complex and dependent on a large set of parameters (William N. Goetzmann, 2003). Despite their powerful position in the economy, the names of the individual managers used to be unknown. Recently, newspapers and magazines have been publishing reports and interviews with them (Freitag, 2006). Public interest in the people is the result of reports about the big deals that are planned and made by investors (Missal, 2006). The investing institution is often a company of significant size itself, depending on the number of investments and consolidated capital, but the people in the back office are unknown. The public faces, if any, are those of the fund managers or owners of investment companies.

2.1.4 Companies in full or part ownership of institutional investors (= investees)

Companies in the portfolios of investment funds are mainly stock corporations and private limited companies, but companies with other legal forms can also be found. In comparison to the shares of stock corporations that are traded on the stock exchange and thus accessible to everyone, an investment in mutual funds gives access to investment in private equity such as private limited companies and other non-public companies. Diversification of risk is one of the advantages compared to publicly traded stocks. Historically, the typical targets for finance investors were businesses which had been valued below the overall value of their tangible assets at the time of takeover, while nowadays the focus includes the capabilities and potential of each individual investment (Kay, 2009).

There are also cases where investors bundle different businesses under one roof to benefit from synergies. Examples for such a build strategy are cases M³

³ Further information about the case studies of this thesis follows in chapter 3 and the appendix.

and N. At the same time, it sometimes works the other way around, i.e. a large group company may be broken up to generate a higher overall return compared to the maximum achievable price for the company as a whole. Evidence for such an investor choice is shown in case E. Entrepreneurial investor behaviour can be found for mature businesses, which is the business type under investigation in this study, but it is much more common for start up companies, not only, but mainly, because the company value is typically much lower.

2.2 Cooperation and interaction between investment funds and firms

One of the wider aims of this thesis is to clarify the role that investment funds play in the firms they own, when the focus is on technology strategy. As not all readers will have knowledge about the interaction between finance investors and the companies they own, this paragraph is intended to provide a short overview. Legal regulations ensure that funds with minor share packages have only very limited options to exert standalone direct influence (Hoskisson et al., 2002). Thus if a minority shareholder wants to get their voice heard, an appropriate strategy needs to be defined within the framework of shareholder rights. One option is to join or invite other shareholders to speak at annual general meetings (Burnett et al., 2012).

Just like all stakeholders, shareholders can also join or support organisations that run environmental or social issue campaigns, for instance, targeting not only industries, but also specific companies (Bomberg, 2012). The situation is the opposite when an investment fund has the dominant share package, because this may mean they have full decision making authority (Campbell et al., 2012, Klein and Zur, 2009a). The management board of the company is then fully dependent on the fund management for authorisation or approval on actions. A clear and good understanding of the options available to companies for interaction with minority and majority shareholders is fundamental to understand the different dynamics, and to draw the right conclusions when analysing the findings at the final stage of the research project.

Because of the significant difference between minority and majority shareholder rights (Hall et al., 2014), the case study sample for this thesis was chosen to consist mainly of cases with dominant investor involvement as this would give more transparency about the role investors play in the area of technology strategy of firms with regards to capability, experience and expertise. Defining the sample that way diminishes the potential effect of lack of involvement due to a lack of authority, which might not be obvious from the point of view of an outsider who is not permanently involved in the interaction process. Reaching an understanding about the basic channels of interaction and the methods of influence is first base before going on to the next layer of investigation concerning the effect of influence on corporate technology strategy (Shahzad and David, 2010).

People may have hidden agendas, individual targets or conflicting interests for a variety of reasons, e.g. the importance of spare time with the family or incentives that are linked with defined KPIs (Burnett et al., 2012). Besides the CEO of a company, the board of management and the executives from all disciplines are the key people involved in the exchange with investors (Burnett et al., 2012). They may be directly involved and interact with investor representatives or only contribute to the preparation of meetings and reports. The controllers play a key role as they consolidate and align the raw data used to prepare a data pack for the investors. Each division and department will want to show a good performance and, if possible, no weak points that would draw unwanted attention, while still respecting the need for transparency.

As in all organisations or relationships, hiding or trying to whitewash issues beyond a defensible level causes mistrust (Tihanyi et al., 2003). Investor teams have an explicit mission to make the best of any investment and clearly this is often not negative, but positive for the businesses concerned. However, they can only accomplish their mission when the corporate management is fully open and transparent in their communication about both the good and the bad. Attempts by the corporate management to “protect” employees, processes or

products by adapting information for the investors is likely to create a negative backlash. Permanent alertness to such hidden agendas and potential distractions is vital in the phases of data collection and data analysis. It is difficult to uncover such phenomena when analysing secondary data.

In face-to-face meetings, however, it is a key task of the researcher to ask questions eliciting information which is not distorted or embellished. This would conflict with natural investor expectation (Hall et al., 2014), no matter what the driving factors are (financial, such as patent royalties, fulfilment of personal KPIs or emotional, such as personal involvement in the development, implementation of products and processes). At the end of the day, a constructive and productive collaboration of both the investor and investee management team is the best that can happen for both parties, as this brings the highest probability of good corporate performance, success and value improvement.

Major disturbances trigger immediate change in an organisation (Klein and Zur, 2009a), as time for incremental improvement and optimisation is limited. In such cases, finance investors often prefer to place third-party consultants with the necessary expertise in senior management positions instead of pursuing the traditional hiring process, which again is linked to their limited time horizon. After defining the basic terms used in this thesis and getting readers that are not familiar with the topic up to speed, the following chapter deals with the current literature considered relevant to the study. That is, the challenges of change and uncertainty for corporations as they cope with a continuous evolutionary process that affects the corporate organisation as a whole.

Chapter 3 Theoretical framework, literature, and research questions

This chapter starts with a paragraph that discusses the timeline and the sources used for the literature review. Thereafter, the theoretical framework, current literature on the subject and the implications of this study are discussed. The intention is to uncover areas where active shareholders could influence the learning processes within companies. Evidence about corporate governance and shareholder activism, gained by other researchers, is reviewed and discussed with a focus on the potential influence of active institutional investors on corporate technology strategy and R&D. The foundation for the literature review and subsequent discussion is the evolutionary theory. Technological change, which is the phenomenon under analysis in this work, can be explained by the principles of the evolutionary theory (Nelson and Winter, 1982).

Discussion with other researchers and study of the existing literature confirmed that an approach based on evolutionary theory would be the most appropriate for this research. In the following, the processes of corporate learning and the potential involvement of shareholders are discussed based on the latest available evidence. Towards the end of this chapter, specific literature about corporate governance, stakeholder and shareholder activism is analysed, including current evidence in the area of technology strategy. The chapter closes with the identification of the gaps in the current literature and the definition of the research questions.

3.1 Sources of secondary data used in the literature review and timeline of the review process

The groundwork for the literature review covered the standard literature on epistemology, economic theory, technology, shareholder activism and corporate governance, which is available in the university libraries of France, Germany and the UK. The review of literature was limited to the English and German

languages, with no restrictions or limitations on the date of publication or geographical origin. This course of action produced a substantial base of existing knowledge, but nothing on the latest trends or scientific research. More up-to-date knowledge was accessed through different online databases, such as Web of Knowledge/Thomson Reuters, EBSCOhost or ProQuest, which include journals that are published on a regular basis and that contain research which has already been reviewed by an expert panel.

Most of the data was extracted from academic journals. But, e-books and other material published online, such as conference reports, etc. also proved to be fruitful sources for relevant information. Interesting articles or books broadened the perspective through their citation section, which in turn showed the way to other published material, people or institutions. Eminent research institutes provided the most recent and up-to-date insights and thoughts, as the material published in their online resources had not yet undergone third-party review (which often takes more than one year). The websites of the following institutes were also reviewed during the study: ECGI (European Corporate Governance Institute, Brussels/BE), ICGN (International Corporate Governance Network, London/UK), GCGF (Global Corporate Governance Forum, Washington/US), BETA (Bureau d'Économie Théorique et Appliquée, Strasbourg/France), SPRU (Science and Technology Policy Research, Sussex/UK), MIoIR (Manchester Institut of Innovation research – former CRIC and PREST –, Manchester/UK), SIEPR (Stanford Institute for Economic Policy Research, Stanford/US), CGRP (Corporate Governance Research Program, Stanford/US), SIPA (School of International and Public Affairs, New York/US), DRUID (Danish Research Unit for Industrial Dynamics, Aalborg/DK).

Last, but not least, articles and interviews relating to the research topic were found in magazines and newspapers such as Manager Magazine, VDI-Nachrichten, FTD, Capital, WELT, FAZ and Handelsblatt. With today's possibilities, finding sufficient data is not difficult, and the focus shifts to deciding which data and information is relevant and can contribute to the study. In total,

163 books (both hardcopy and e-books), 674 articles in journals (only e-Journals), 269 articles in newspapers, magazines (hardcopy) and other online sources (electronic format) as well as 137 working and discussion papers from research institutes (electronic format) were reviewed and used for the literature review and discussion in this chapter.

In the following paragraphs, data from all the areas that were considered relevant, either as a base for the research project or in close-relation to the research questions, was reviewed, analysed and discussed. Journals targeting corporate governance, shareholder activism, economics, strategic management and finance were identified as being most relevant for the study. After a solid fundament had been created from basic literature, the online search was continued following a structured process involving keywords, both standalone and in combination. The literature review was conducted in several different waves. The first wave being a review of all the data that had been published to date, without any limit on the publication date.

This first and largest wave was conducted in 2006 and 2007 as part of phase 1 of the DBA project. The second wave was conducted at the beginning of phase 2 of the DBA project, in 2008 and 2009. In the following years leading up to 2014, an annual review was conducted to update the relevant literature, searching only for literature published after the last review date. By following this method, this study has been able to integrate all relevant literature and data published up to mid 2014. Additional, company-specific, data was collected and reviewed as part of the case study research, which started in 2007 and continued until 2011. During this time span, historical and current data and information were collected and analysed in preparation for the interviews, and also in order to have the necessary background to draw the right conclusions.

3.2 The role and influence of finance investors in organisational learning and adaptation processes

To understand how organisations can be influenced by finance investors it is vital first to understand how organisations are structured, how they work and how businesses are permanently influenced by the natural processes of learning and adaptation. Having a good knowledge and understanding of the latest research in this area is crucial to be prepared for interviews that deal with this topic to analyse the impact of investment fund involvement. This ensures that the right questions are asked and that the answers can be interpreted correctly. Organisations vary significantly in activity and size and as such each one is individual and different. Some characteristics are shared between all of them, allowing classification into different categories.

A very basic description covers just three aspects – human activity in a socially designed system, goal orientation and respect of defined boundaries (Aldrich, 2007). Any influence in these three areas is equivalent to triggering people and impacting the organisation as a whole with the consequence that the system will come to a new equilibrium. At the end of the day, performance always comes down to the individual people who form the organisation, which in effect means any kind of involvement results in an influence on people, and investment funds are no exception to this rule. Generally, the long-term survival and competitiveness of a company is dependent on a variety of constraints, conditions and circumstances, which differ from one company to the next (Nelson and Winter, 1982).

All these influencing parameters are permanent and sometimes rapidly changing (Durmusoglu et al., 2008) so that experience and expertise of decision makers is of high value in each company. It is a fact that, “Companies are not isolated institutions; they constantly interact with their environment. This includes markets, customers, suppliers, competitors, regulatory institutions, staff, economy, ecology, science and technology, etc.” (Augsdoerfer, 1996). In conclusion, it is clear that markets, competitors and products change so quickly

that permanent monitoring coupled with acting and reacting is key to keeping pace with evolutionary processes and to ensuring the business remains in the club of fit companies with long-term survival perspectives.

Anyone who is part of the organisation or a stakeholder with rights to take influence can impact the organisation. Although influence is also correlated to hierarchy and the will to change things. Re-setting the goals or boundaries in an organisation through leaders or external influencers such as finance investors – the influencers at the focus of this work, can cause friction and frustration when the necessity for these new conditions is not explained to or supported by the employees who are part of the organisation (Aldrich, 1999). When a new management or outsiders, such as consultants or finance investors, drive initiatives, the workforce can switch into alarm mode and fear a negative impact, which in turn is not beneficial for the shareholders and/or the top management.

But it is possible to get the workforce on board. It is possible to inspire their motivation, however this requires open communication and explanation of the reasons for change and adaptation. Making sure all the stakeholders understand the underlying motivation for a take-over by a finance investor is key to getting their buy in and ensuring there is support and identification with the goals and boundaries. This is important for all businesses and all change. It is assumed that interactive processes are prevalent, because the classical theory of decision under certainty, assumes that economists are rational, infinitely sensitive and well-informed, with the result that all possible actions are known and the outcomes are foreseeable (Simon, 1959).

But this does not reflect reality. In the classical understanding, all the relevant and influencing factors would have to remain static, which is evidently not the case in an economic environment (Schumpeter, 1911, Schumpeter, 1908). If the fundamental and comprehensive prediction of complex systems like the economy were possible, everybody would be immensely rich. A lottery would

not work in the way it does today, where prediction of the winning numbers is impossible and the only party winning each time is the lottery institution. Applied to individual businesses, prediction of influencing parameters and subsequent decision-making might seem less complex, but in fact it is not (Lazonick, 2007). All the stakeholders of firms including the workforce are aware of this, which leads to the consequence that the confidence for directional changes initiated by the business leaders is not a given, but has to be “acquired”.

The fact that the people who are part of an organisation can never think or act independently from memberships in or relation to other groups or organisations (Weick and Quinn, 1999) is a key point to be considered when decisions within an organisation are made. Conflict of interests may not be possible to avoid and therefore, decision-making processes can never be fully rational (March, 1965). With regards to corporations, the interests of a finance investor, a private company owner and a CEO of a public company are overlapping at wide extend but are different in the detail. In addition to the problems that arise from relationships and conflicting interests, the complexity of the environment multiplies the uncertainties (Mohrman and Lawler, 2012).

Any party trying or wanting to exert influence needs to understand this correlation and structure conditions for the specific organisation. Otherwise it is pretty much trial, error and learning from failure, which for public companies especially is not an option due to the simultaneous reaction of the stock market. While planning based on accurate analysis and mathematically calculated assumptions is standard for most firms, the latest studies also produce evidence that a pragmatic and flexible path is often the better way to reach a given target (Kay, 2010). This in turn is evidence supporting the assumption that evolutionary processes influencing the economy and the interacting corporations are not foreseeable and that long-term planning is difficult.

The involvement of a finance investor with large previous experience can be highly valuable and positively impacting the speed and grade of adaptation of a business to changing conditions. No matter for what reasons changes are made or initiated within an organisation - it is crucial to be transparent on all levels of the organisation. Transparent not only in the reasons for doing something, but also regarding the expected outcome and consequences of not doing it or doing it differently can help a lot to make people in organisations understand and support specific actions, especially when finance investors are involved. What is important for everybody to understand is that there is no 100% guarantee for the success of a certain strategic directional change.

The reality is that each enterprise has to find its own way of remaining alive, as making decisions under full certainty is in most cases impossible (Langlois, 2007). Darwin's finding that only the strong species that can best adapt to a changing environment will survive (Darwin, 1859) is today more than ever applicable to the economy and individual enterprises (Frank, 2011), while differences in both spheres are still the subject of scientific discussion (Cordes, 2006). A distinction that is relevant to today's economic context is the speed of adaptation, which often is more critical than the accuracy with which it happens. Global competition is present everywhere and the speed at which conditions and assumptions are changing is greater than ever (Birchfield, 2012).

It is crucial for all firms to be open to change and synchronised across departments and working levels. Finance investors often take advantage of the hesitation of a company owner or leader to drive change when this is needed to offset inefficiencies or the inability to adapt to the evolving environment. Schumpeter used the term "creative destruction" to describe the permanent process of displacing something that is well-known and replacing it by something new (Becker and Knudsen, 2002, Schumpeter, 1939). Coping with permanent changes in knowledge and information due to interaction with customers, suppliers, external partners and fluctuation of employees (March, 1965) is already a challenge well understood in many areas and regions.

In combination with incredibly fast communication channels, globalisation is multiplying the complexity and appears to be one of the major enablers and drivers for frequent change and high mid and long-term uncertainty (Laszlo and Blachfellner, 2012). Just one such example for the permanent challenge of a truly global company is the management of a global footprint in the face of demand and currency fluctuations, political crisis, knowledge transfer between regions and other uncertainties. This environment sets high barriers for companies competing with others in the market and demands highly skilled and knowledgeable decision makers. Companies that have lost their way in this increasingly competitive environment are often attractive prey for finance investors.

All businesses have to compete with each other for a limited number of customers and it is clear that only the best companies with the right products and the right strategy will survive in the long-term (Greenwood, 2012). Thirty years ago Richard Nelson and Sidney Winter identified routines from which they derived a model of industrial evolution with innovation and global imitation (Becker, 2006). They analysed the necessity of R&D investment for innovation, the correlation of competitive advantage with innovation, and differences in the organisation of companies with the conclusion that the industry evolution is determined by the innovation activities of the enterprises (Nelson and Winter, 1982). The role and involvement of active shareholders in monitoring and reacting to varying conditions, developing long-term strategies and short-term tactics for the firms in their portfolio and how they cope with unavoidable change has yet to be clarified in detail.

It is vital for the successful management of corporate change and uncertainty to have capable decision-makers involved who can also discuss critically divergent opinions (Engau and Hoffmann, 2011). Do investors actively help and contribute to this? When steering large mature organisations, it is crucial to have the capability to react quickly, analyse and wherever possible also foresee threatening situations. With regards to shareholder activism and corporate

control, the question arises as to whether a corporate management has the freedom to act accordingly without prior approval. Personal experience is a factor that is not equal, but different for all individuals. So are paradigms such as the view of the world and the methods and tools to act in line with this (Henderson et al., 2006).

Both knowledge and experience can be acquired from outside the company. Depending on the company need, this can be done by hiring permanent employees with a profile that fills a determined gap, with temporary workers or with consultants who support specific projects for a limited period of time. When change comes in small incremental steps, it can be foreseen and planned for, according to how a firm observes the environment. In the long-term, if they wish to avoid vanishing from the market, every organisation needs to learn to adapt automatically to change (Mohrman and Lawler, 2012). While for some managers, it is difficult enough to translate incremental change into adequate corporate actions, a much bigger and thus often critical challenge is to react to radical changes that completely re-set the scene (Oliff, 2012).

Knowledge and competitiveness gaps versus other firms with faster learning curves and in the worst case the bankruptcy of a business are potential consequences, if incorrect or no action is taken. The area of technology is very sensitive as technological progress can make previous advanced technology outdated and demand immediate, but sensitive management action. Knowledge growth starts from individuals and thus a structure allowing and ensuring the central consolidation of knowledge and its distribution to others within systems is of high importance for the consolidated knowledge growth of a system (Metcalfe et al., 2002). All change automatically leads to an increase in knowledge and information within every single company.

Where many firms struggle is to share and conserve the lessons learned. Investors often come onto the scene to intervene and take corrective action

when an opportunistic and selfish management does not condition and steer a business accordingly (Gillan and Starks, 2003). As companies do not have cognitive capabilities per se they learn through the people who reflect and store the learning and knowledge in descriptions of procedures, methods, rules, the corporate culture and values and different kinds of databases (Schulz, 2001). Like all human beings, both company managers and investor representatives are on a continuous journey of learning from personal and second-hand experiences, training, individual study, modelling and coaching (Antonacopoulou, 2006).

The emphasis on aforementioned contributors to learning differs from person to person due to the fact that everyone's set of stimulators is different in intensity and frequency. Furthermore, cognitive capabilities and individual interests are not equal for all human beings, like feelings and emotions triggered by environmental factors (Lucey and Dowling, 2005). Inefficiencies and friction inherent in every system is the potential for active shareholders to mine, for their own and other shareholders' benefit. There is no standard recipe available to company leaders that describes how to react and what to do that covers all possible cases and situations. Also empirical work done in that area is as of today quite limited (Kempster, 2009).

Anecdotal evidence in several management books indicates that company managers typically either have a strong track record in a specific industry where they have held several positions in different companies or they climbed up the career ladder in one company over time. In both cases, they will be familiar with the product and industry-specific requirements, state-of-the-art technology and trends. The experience gained about standard processes is just as relevant as that gained from extreme and critical cases. People who have only experienced one company or one segment often reach their limits when new challenges arise due to radical changes. For active shareholders, this can be the point where a potential risk for a firm can be turned into the chance to beat competitors in the market who are struggling with this as well.

It is assumed that the wider the portfolio of experience, the smaller the risk that a manager will encounter a situation where they do not know what to do or how to react. Conscious and subconscious learning from past situations is one of the key elements for excellence in leadership practice (Kempster, 2009). It is subsequently important for firms not only to apply knowledge and experience in decision-making processes, but also influence definition of the learning and memory structures within a business. Whether active finance investors can and do affect the corporate learning processes of the business they own as much as the employees or consultants cannot be evaluated as yet. A lot of information is available about shareholder activism and its effects in general, but the actual process of shareholder involvement has not been analysed at the micro-level.

When an investor enters a new business field where they lack expertise, it is unlikely that they will exert an influence on products or segments. There can be similarities among enterprises, which are independent of the products or sectors, but with which an experienced investor is familiar and which could take the business forward quickly, instead of having to hike through the full learning curve again. The question arises as to how investors would share their knowledge with the portfolio company. Bearing in mind that most investors not only hold one, but a portfolio of investments, it can be assumed that the time and effort spent on each individual investment is linked with its importance in the portfolio relative to other investments.

An indirect way to speed up learning processes taken by some investors is to acquire expertise in the form of top managers. One prominent example was Mr. Wolfgang Bernhard, ex-board member of Volkswagen and Daimler Chrysler (Braunberger, 2007). He was hired in 2007 by the Private Equity Company Cerberus to take over a leading position at one of their latest investments, the US carmaker Chrysler. With such human resource strategies, investors are clearly aiming to position themselves to play a more important role than just financing. The evolution of this specific triangle of cooperation (Cerberus ⇔

Chrysler ⇔ Bernhard) however shows that a combination, which may at first sight have appeared ideal, was later no guarantor for success.

Bernhard stayed for just one year. Another year later and Chrysler was again close to bankruptcy, but survived due to a cooperation with the Italian carmaker Fiat (plö/Reuters/dpa, 2009). Whether the plan of Cerberus to hire an automotive expert was wrong from the beginning or whether the situation evolved in a direction that made it fail cannot be said. Due to the complex structures and influencing parameters, the risk that an HR decision may fail cannot be avoided. It has been proven that institutional investors typically have extensive expertise in monitoring and analysis of economic data and benchmark analysis of different firms in a segment by comparing available numeric data (Li and Xue, 2009).

This is in fact not a surprise, as this is the basis of their business and often decisive for a right or wrong investment decision. The pace with which such investors can work to get an overview of a business including its weak and strong points is thus very high. The major reason why investors get on board companies that are not using their full potential is that they have the capability and expertise to do so. Their primary interest is often not to keep companies in the portfolio, but to transform the potential company value into a positive return for the investor. Thus adequate action to get the best out of an investment has to be identified and launched quickly. The outcome of the initial analysis is an action plan that can also involve a certain risk, maybe more than the corporate management would take, when the model developed by the investor is promising overall and in line with certain criteria (Baysinger et al., 1991).

When the corporate management team decides that the direction dictated by the investor is too risky, this can lead to conflicts and lack of management engagement in achieving the target. Most of these exchanges and conflicts happen behind closed doors and do not become visible to the outsiders who are

not directly involved from the investor or investee side. Ideally, the shareholders and management of a company have the same objectives and the same understanding of how to manage a company and which targets are achievable (Daly, 2011). And in fact this would be the case if the classical theory of decisions under certainty made by economists who are fully rational and completely informed applied.

In reality however, individual opinions are often different and not seldom contrary to each other and this leads to conflicts between the corporate management and active shareholders - so called agency conflicts (Tien and Chen, 2012). One rational explanation for this natural discrepancy is that the knowledge and learning processes already undergone are often different for corporate managers and investors. When institutional investors have greater experience and know-how than company managers, it would seem plausible for them to engage themselves actively in firms they own. But in how far the availability and access to knowledge and experience can guarantee the ad hoc application to other situations or systems is questionable.

Thus discussions about “the right way to go” between investors and corporate management teams are normal, as they are for every form of organisation where people with different backgrounds and experiences have to define common goals, boundaries and appropriate activities. Overcoming such distractions is crucial for the success of a business and subsequently the investment made by the investor. Combining the knowledge and experience of both parties is the best guarantee for corporate success. What makes it even more difficult is the fact that enterprises like economies are systems which are individual, specific and permanently influenced by an incredible and in most cases not quantifiable number of parameters (Metcalf et al., 2001).

To simplify the complexity most of the models built to simulate the system exclude factors that are not significant. A tricky point could be that opinions of

individuals about what is and what is not a significant factor are possibly divergent. Without having sufficient knowledge and understanding of a system, it is difficult to steer it actively. Evolutionary strategies that are stable may remain uncovered. That it is difficult, but not impossible for an outsider to make a difference to a business has been proven by a number of restructuring and turnaround managers. These groups of people often have no more than a few months to get companies back on track. Various examples for this can be found in the economic literature.

What needs to be kept in mind however is that in such cases it is often not the optimisation and long-term competitiveness that is at the centre of the activities, but short-term survival, accepting the corresponding restructuring cost (Lin and Yang, 2012). While restructuring requires rigorous action, a process of stabilisation, as a second step when the measures have been successful, is needed. When the reasoning behind the steps taken has not been explained or was not explained well enough to the workforce at an early stage, there is the unavoidable risk that good and skilled employees, who are vital for the business, leave to go to other companies where they hope to find more stability and security. How to keep alive or spark corporate entrepreneurship (CE)⁴ within an organisation therefore is a topic of major importance for finance investor representatives or turnaround managers and thus of relevance to this study.

CE is in many organisations the dominant factor in organisational development, problem solving and performance improvement (Antoncic and Hisrich, 2004). Ideally it should be top-down - managers create an environment where CE can be practised and communicated - and bottom-up - employees can seek

⁴ Corporate entrepreneurship (CE) is entrepreneurship in existing organisations of all sizes in the form of entrepreneurial activities or behaviour, superior to or divergent from the standard procedures and processes ANTONCIC, B. & HISRICH, R. D. (2004) Corporate entrepreneurship contingencies and organizational wealth creation. *Journal of Management Development*, 23, 518-550.

dialogue with the management, activities are acknowledged and rewarded in the organisation - (Heinonen and Toivonen, 2007). The difficulty for finance investors or turnaround managers is that due to a lack of trust, unclear directions or rules, potential corporate entrepreneurs remain passive or at least do not apply their full potential. Any such interference destabilises a system that used to be evolutionary stable until a new equilibrium or system stability is found.

The problems and dilemmas discussed before plus the financial affairs and ruins of well-known, world-leading companies during the recent financial crisis led to the sharp focus on corporate governance laws and provisions (Mallin, 2012). As the effects were global, the topic became the centre of expert's interest all around the world. At the same time, both individual and institutional investors lost confidence in existing corporate governance systems and mechanisms. While individual investors have only limited possibilities to exert influence, institutional investors who have full or dominant ownership can involve themselves strongly to improve and reshape the situation. This is a radical change to the past when most shareholders passively held their shares, considering them to be a security with growing value.

Today, most majority shareholders act in line with the possibilities and responsibilities they have through their ownership of businesses (Davis et al., 2006). Even more, they recognise that effective engagement with companies in their portfolio is vital for them to achieve good long-term performance and survival. A cooperative and trustful leadership team in the concerned companies is equally important and must not be underestimated. Above and beyond this, different institutions, such as the OECD (Economic Co-operation and Development) and the ICGN (International Corporate Governance Network), are making efforts to harmonise, orchestrate and structure corporate governance practises globally.

The principles published and regularly updated by organisations of that kind cover the major rights, responsibilities and public obligations, such as voting, creating value and monitoring (Mallin, 2012). As the existing knowledge about the impact of corporate governance and specifically, the influence of shareholder activism on corporate learning and evolutionary processes, correlates to this project and is relevant, it is reviewed in the following paragraphs more in depth. Shareholder activism as an area of corporate governance includes all the instruments and actions that are available and utilised by shareholders to exert influence on the firms in their portfolios and also to resolve agency conflicts (Smith, 1996).

All shareholders (= principals) struggle when cooperating with corporate managers (= agents) because of cognitive and behavioural limitations (Lazonick, 2007) that cannot be fully eliminated by mutual contracts (Jensen and Meckling, 1976). The principals (= shareholders) hire agents (= corporate managers), delegate duties and responsibilities to them when they themselves do not have the knowledge or skills that are necessary to do the work or when an agent can perform the same task at a lower cost (Caers et al., 2006). This condition is the basis for a functioning relationship between institutional investors and the managers employed by the companies in their portfolio. As the welfare of both the principals and the agents depends on the outcome of the agents' actions (Bowie and Freeman, 1992), the shareholders in the role of the principals will become active when they can contribute to the success of the business.

A limiting and problematic factor in relationships with large institutional investors can be an asymmetry in the overall financial situation of both parties. If shareholders have widely diversified their invested capital in shares of 100 firms with varying output and performance, it is then not per se dramatic for them if a single institution goes bankrupt when a risky strategy fails. For the corporate management of this particular institution, this can however be a disaster if the managers have no other income. Subsequently they will understandably tend to

keep the risks low (Munari et al., 2011). Risk-avoiding management behaviour like this means companies do not use their full potential to enter new markets or expand in existing markets with mid and long-term R&D investment (Gillan and Starks, 2003).

Active shareholder engagement and a board of directors who objectively act and judge must identify any such “drifting” management behaviour and trigger corrective action. If corporate managers are not forced to take risks, they are in a very comfortable position without the need or motivation to maximise their efforts by accepting some entrepreneurial risks (Makri et al., 2006). Furthermore, the shareholders’ return on investment will never be maximised when the managements’ compensation is linked purely with actual financial results. To avoid such management behaviour, various instruments such as performance-oriented incentive schemes are used, but with questionable effectiveness (Lin et al., 2011). A major difficulty in this regard is to define how performance can be accurately measured.

If incorrect key figures are used as performance indicators or if the management manipulates these figures, the system and process is ineffective and the investor is again in trouble. The management is then enabled to serve the own interests in a way that does not support the interests of the shareholder (Englander and Kaufman, 2004, Jensen, 1994), but exclusively their own. This is a dilemma for the shareholder, but with their limited insight it is often difficult to figure out whether the corporate management is using the full potential for the company’s objectives or not. Incentive schemes are therefore frequently modified in consideration of the latest situation of the company and the interests of the shareholders, which is an effective but still insufficient measure (Levinthal, 1988).

According to Makri, Lane and Gomez-Mejia, a combination of targets including short-term financial results and innovation-related behaviour and attitude are

key for technology driven companies (Makri et al., 2006). In effect, a corporate manager or agent is in the better position as long as the shareholder or principal does not have perfect information about the company, agent capabilities and agent activities - which they never will have. If the agent receives a fixed payment and no performance linked incentives, they will employ as little effort as possible to achieve the agreed objectives. If they do receive incentives for extraordinary performance, they can influence or even manipulate the indicators.

The fact that the objectives and motivations of shareholders and corporate managers are not congruent leads to the so-called agency conflict, which means the actions maximising the joint profit are contrary to the actions maximising the private profit of each contractual partner (Sundaramurthy and Lewis, 2003). To eliminate or minimise agency conflicts and agent costs is one of the core targets of shareholder activism and corporate governance (O'Sullivan, 2000, Aguilera et al., 2011). But the relationship and cooperation between active majority shareholders and the corporate management, within the framework of the traditional agency theory and beyond, is still widely unexplored (Lazonick, 2007, Sugheir et al., 2008).

During two decades to the end of the 20th century a similar simplified view triggered the belief that maximising shareholder value results in the best possible economic performance, but this turned out to be not true (Lazonick, 2007). Specific agency problems that can be observed in businesses that are constructed for stability and improvement of existing systems (Birchfield, 2012) include skilled incompetence⁵, defensive routines⁶ and fancy footwork⁷. These

⁵ Skilled incompetence is the use of strategies to hinder changes in organisations with the objective of avoiding someone losing face in such modified conditions WENGLER, R. & SVENSSON, P. (2008) The skilled incompetent manager. *Sociologisk Forskning*, 43-+..

⁶ Defensive routine means the automatic use of mechanisms to protect members in organisations from embarrassing or threatening events ARGYRIS, C. (2003) A life full of learning. *Organization Studies*, 24, 1178-1192..

are hurdles for companies on the way to success that can lock improvement potential and hinder changes with high risks for firms (Probst and Büchel, 1998). In an environment such as we have today - fast changing, aggressive and with lots of competition (Aguilera et al., 2011), such attitudes can significantly slow a business, especially when the attitudes have been entrenched for years.

Adaptation is vital but can only happen when the need for it is recognised and discussed openly (Mohrman and Lawler, 2012). All such stagnation-oriented firm behaviour is potentially attractive for investors who recognise the latent potential and are not reluctant to break down barriers that hinder changes (Graves and Waddock, 1990). Breaking up existing comfort zones and requesting an open and constructive exchange including decisions for necessary adaptations are some of the dominant levers that activist investors use post-acquisition. While this can be negative for managers who set the barriers, it potentially frees up creativity and power for employees who have become tired of running up against walls.

The ones who do not leave the company are prepared to continue in suboptimal circumstances and conditions after realising that it is less painful than to drive and enforce change and evolution (Hon Keung and Alison Lai Fong, 2010). It is typically only a small group of people who benefit when no or just minimum change happens. In companies it can be the top management and a few selected people who profit from change being avoided or reduced to a minimum. In one of the cases described later, the case C, the majority of the executive team were close to retirement and wealthy, because of the good salary they had had for two or even three decades. In that company, changes were accepted only when it was absolutely necessary, e.g. because of a customer demand with the threat of losing the majority of existing business.

⁷ Fancy footwork stands for the use of all mechanisms that are used to avoid uncovering management failures BEER, M. & EISENSTAT, R. A. (1996) Developing an Organization Capable of Implementing Strategy and Learning. *Human Relations*, 49, 597-619..

Whether the wish to remain in the comfort zone and refusal to accept new challenges is linked more to the age of people or with the individual people's mindset and targets is unclear and not important for of this work and thus not specifically analysed. Relevant is only that such behaviour offers a potential for investors who want to achieve the maximum from a company by implementing each and every measure needed (Klein and Zur, 2009b). Such shareholder activism and all associated active and deliberate activities influencing the strategy and politics of a corporation are scientifically classified as an element of corporate governance (Brandenberger, 2002). Corporate governance generally takes into account the interests of all stakeholders, not only the ones of the board of directors, management and shareholders but also the ones of customers, suppliers, employees and as a whole, even the community and the environment (Becht et al., 2002).

The different interests are protected and regulated by a variety of corporate governance policies, laws, customs, processes and institutions (Vintila and Gherghina, 2012). The most important areas concerned are fiduciary duty, accountability and the economic efficiency view, targeting on optimised financial results and shareholders' welfare (van Ees et al., 2009). Rules and mechanisms are in place to ensure companies always act in good faith. In the context of this thesis, this means to influence the management decisions of a corporation on environmental issues, product strategy, market strategy and all areas of profit maximisation that directly or indirectly influence technology strategy. It is unsurprising that years ago institutional investors were the first among shareholders to exert influence in amendments or changes in corporate governance (Parrino et al., 2003).

In the early 1980s shareholders started to become active in certain areas, it had become common practice by the 1990s (Nelson, 2005) and since the financial crisis that started in 2007, has been expected (Mallin, 2012). Today some large companies organise events in parallel to annual meetings to exchange information with their majority shareholders about topics that have been

identified to be of interest, either by the organising company or the shareholders to avoid being confronted publicly with aggressive shareholders (Park and Tonello, 2009). While at first sight this appears to be very good practice, it is highly important that these events are not disadvantageous to the minority shareholders who are not invited (Thamotheram and Le Floc'h, 2012).

The involvement of lawyers and experts who know the latest regulatory framework in the area of corporate governance is therefore absolutely vital to avoid problems with non-participating shareholders afterwards. Talking to people with personal experience in this area, it is clear that direct exchange with shareholders is often a walk on a very thin line. The dominant trend in today's landscape of making use of the voice option⁸ needs to be considered in the actions and decision-making processes to avoid escalating conflicts, because if no direct exchange channel is provided some shareholders will find an indirect one (Smith, 1996). The other traditional options developed by Hirschmann in 1970, the loyalty option⁹ and the exit option¹⁰ (Hirschmann, 1970) are still chosen for minority investments, but for most majority shareholders, it is a must to involve themselves actively in the businesses they own.

⁸ The voice option means to exert influence on a corporation through direct activity aimed at approaching the company management. The use of voting rights is very popular and active participation in annual general meetings FERREIRA, M. A. & MATOS, P. (2008) The colors of investors, money: The role of institutional investors around the world. *Journal of Financial Economics*, 88, 499-533.

⁹ The loyalty option describes loyal shareholders who have decided not to take any action to influence their portfolio companies, but to keep their shares. They wait passively for what time will bring and put their loyal trust in the company, in fact the company management, hoping that they will do the right things, so that over time the shareholders are rewarded for their loyalty and patience. SUDARSANAM, S. (2008) Does Shareholder Activism Help or Hinder Shareholder Value Enhancement? (Empirical Evidence from the UK). Cranfield, School of Management, Cranfield University.

¹⁰ The exit option means simply to sell shares instead of either being loyal and waiting or becoming active ADMATI, A. R. & PFLEIDERER, P. (2009) The "Wall Street Walk" and Shareholder Activism: Exit as a Form of Voice. *The Review of Financial Studies*, 22, 2645-2685.

A tricky topic, which needs to be approached in this thesis, without putting the focus on it, is the representation of shareholders on management boards. Of specific interest is the involvement and influence of board members in so-called top-decisions, which are significant for the future direction of a company (Useem and Zelleke, 2006). With reference to this, corporate governance not only observes the operational company structures, but also takes a close look at the supervisory board (Hambrick et al., 2008). For minority shareholders the repertoire of possible actions in this regard is pretty much limited due to the relatively small amount of influence and power they have. In a few rare cases, minority investors write “poison pen letters” to the CEOs of corporations in which they have shares to force change when they are not satisfied with the performance of the portfolio company top management or the CEO.

This is a very tough method that can gain enormous momentum. Traditionally a “poison pen letter” was written anonymously with vitriolic content, intended to upset or unmask the addressee in a very direct and impolite manner. The modern version in the finance world however is very often published, sometimes on a website, sometimes even in the newspaper in the form of an advert. The authors are typically founders of investment funds or top fund managers and known for such extrovert and aggressive behaviour. Two well-known candidates are Daniel S. Loeb and Carl Icahn. They are very offensive and direct in their letters that are often several pages long. Things like blaming a CEO for spending time on the golf course during business hours instead of taking care of the shareholders interests are standard content.

In the same way missing information about and engagement within the company are highlighted. Most painful for the addressees is that these letters generally spark discussion and comment about what is actually pure *schadenfreude*. The letters trigger an avalanche of unrest, which at the end of the day can overwhelm and bring down the CEO. One of the most recent examples of such a showdown was the “battle” between Carl Icahn and Yahoo. Ultimately Icahn was unsuccessful, but he definitely gave the Yahoo board

members a hard time. Examples of such behaviour can be found on the websites of the investor perpetrators. Often with provocation for other shareholders to join in with the criticism. Putting pressure on the portfolio company CEO is often the primary target of finance investors (Block, 2006).

Having understood that, it is no surprise that such people and organisations are aggressive and use all they can to exert influence simply because they are convinced that they are cleverer, better able to estimate the market trend and more focussed on the shareholder interests. Whether this is reality or whether this type of investor actually is more capable or only populist and strongly entrepreneurial, cannot and will not be analysed in this work. But it is a fact that this extreme form of shareholder activism does exist. Such a course of action is no option for private minority shareholders who are not prominent. When single shareholders cannot reach a critical momentum, they can amalgamate their shares with other shareholders or authorise a third-party to act in place of them, e.g. at the annual general meetings (Engelken, 2005).

However only very few minority shareholders actually walk that way to express their views, recommendations and requests (Daly, 2011). Interestingly, not only private investors can join proxy actions but institutional shareholders as well (Klausner, 2001). Bundling of individual votes and minority shares is even supported by the governments of many countries through specific laws. The target is to allow several minority shareholders to reach a critical mass, i.e. be a significant lever to be heard by the companies in which they have invested their money. In Germany for example, since November 2005 companies have had to accommodate a shareholder activism law - the bill of UMAG (Corporate integrity and modernisation of the right of appeal).

The main focus of this work however is on individual institutional investment companies that hold share packages large enough to exert influence without requiring any authorisation or support from other shareholders. If and to what

extent shareholders become active or not depends strongly on their opinion of the corporate management team (Parker, 2007). When a management team acts following stewardship principles – this means setting the goals of the corporation above private goals and not concentrating primarily on lower-level needs like payment and safety (Caers et al., 2006) – then shareholders should either not become active or give only positive advice. Stewards are likely to follow altruistic principles and create a positive stimulus towards a common target of a business (Dicke and Ott, 2002).

They are driven by ambition, aim for higher-order needs like self-fulfilment (Davis et al., 1997) and can be found in all hierarchical layers of a company. Stewards in the second and third management line can be the real drivers in a company's success. They can easily compensate for a lack of competence and engagement of a first line manager so that a weak performer in the top management can be invisible. Identifying such interdependencies and putting subsequent “corrective action” in place can unhook further entrepreneurship potential when the right leader, who can orchestrate such a team, is on board. The expectation is that a strong correlation exists between the shareholders' opinion of the management team and shareholder influence on the organisational development and evolutionary processes.

A tactic of institutional investors to gain quick results is to assume that minority shareholders will follow them when they use the voice option due to belief in the expertise of the institutional shareholders (Park and Tonello, 2009). That wave works in both directions when prominent investors sell or buy so that this effect in itself is sometimes sufficient to generate a positive profit margin for the “lead” investor, simply through the market price fluctuation, which is triggered by the pull effect. Such purely speculative approaches are one of the main root causes for scepticism by company employees when an investor acquires a large portion of shares. Working against such cognitive hurdles is key to avoiding wasting time thinking about the “real” intention of an investor.

The positive effect that shareholder activism offers shareholders – regardless of amplitude – is not necessarily equally beneficial to the company leaders. When shareholder activism targets the resolution of an agency conflict at CEO level that is limiting a business's potential profit, it can put the CEO in an uncomfortable situation. In such cases, all regulations and options are applied to put pressure on the CEO to make them work the way they should in their role. Another option is to replace the CEO when their profile does not fit to the directional change attempted by the investor (Decker and Mellewig, 2012). CEO's are paid a lot of money and thus they should use all their capabilities to attain the maximum for the company they are leading.

When they are unable to be a continuous successful leader, replacement is unavoidable. However a CEO can react in several ways that are harmful for a company as well. If they are not willing to adopt the shareholders' opinions and requests, they can reduce their activities and efforts to a minimum to avoid an escalating conflict. This would be a worst-case scenario because the reduction in effort is not immediately visible to other people. Another possible CEO reaction would be to quit their job instead of battling with shareholders on the issue of how they manage the enterprise. Many senior executives are financially independent, having worked for decades in top management positions. Their primary motivation for working is very often just the power they have in an executive position, not the salary.

In such cases a limitation of power could be a reason for a CEO to quit their job. In such a case the evolutionary development of a business and its processes would be affected indirectly and unintended. The effect for the business and the employees is the same, similarly to when any shareholder influence in that direction was made intentionally. The negative effects of too much or too offensive shareholder activism are also mentioned in an interview of Dennis Block of Cadwalader, Wickersham & Taft. He said that an increasing number of CEOs and directors are experiencing more pressure to improve the company performance from the shareholders than from their job itself (Block, 2006). If

one counts the numerous reports about aggressive shareholder activities that are published in the media and consider the unofficial face-to-face discussion between institutional investors and CEOs, that sounds realistic.

Obviously this is not good for either the CEOs or the business when a huge amount of the leaders' time and energy is "wasted" on giving statements to active shareholders. On the other hand, people or institutions that have dominant share packages in businesses can dictate the direction to be taken, based on information they need to force from the management team (Gillan and Starks, 2003). The opinions about the overall role of institutional investors are ambivalent, depending on the holding time and the size of the share package (Hsu and Koh, 2005). Investors who prefer short holding times and small package acquisitions are supposed not to become directly involved in corporate governance issues related to their investments, but stimulate myopic behaviour of the managers at the businesses (Porter, 1992, Bhide, 1993).

On the contrary, different researchers found that investment institutions watch and "educate" the management team in the companies they own to avoid legal or regulatory conflict (Bushee, 1998). When institutional investors are engaged in the businesses they own, they are often supporting long-term strategies of the management (Wahal and McConnell, 2000), and not what is generally assumed to be the short-term orientation of investors. In some cases institutional investors even act as a buffer between short-term oriented individual investors and corporate management teams who develop long-term oriented strategies and visions (Wahal and McConnell, 2000). This can be explained by the fact that institutional investors have broader access to the information and resources supporting them in developing a realistic prediction of the potential future gains from long-term investments (Shleifer and Vishny, 1997, Elyasiani and Jia, 2011).

Scenarios described in existing research confirm that asset managers not only monitor what happens in the companies in their portfolio, they also impact them strongly on different occasions in different areas (Freitag, 2006). Their risk-taking ability and willingness correlates strongly with the portfolio diversification they have. At the end of the day, the priority of each individual investment in the portfolio of finance investor is strongly linked with the individual relevance, relative to their overall portfolio value. Independently of that, short-term oriented “traders” never engage themselves as long-term oriented finance investors do. This means large shareholders with a handful of investments tend to be conservative and push long-term strategic investments with high potential returns, but correspondingly low risk in contrast to ones with largely diversified portfolios (Munari et al., 2011).

The success of the businesses triggers the shareholder value and liquidity as key areas of interest for each investor (Gillan et al., 2000). One option that institutional investors choose to reach their ultimate goals is to impact and influence directly the diversification of companies by strategic business exits or striking new paths through acquisition of germ cells (Decker and Mellewig, 2012). In such cases the investors dictate direction and corporate management follows. A very effective measure to ensure that the shareholders’ opinions and strategies are implemented in the businesses they own is participation in the selection process of the corporate management team (Campbell et al., 2012). In some cases this even takes place when active investors enter a merger or acquisition (Burnett et al., 2012).

It seems plausible that institutional investors would need to be involved in the technology strategy decisions taken by the firms they own in part or full, independently from any market or sector driven desire or strategy. This would imply they believe they know better than the company management which technology or technology strategy is the best one for a specific business. Current literature does not deliver sufficient evidence to allow a watertight conclusion, but indicates the requirement for research in this area. The outcome

of different studies that the positive effect of shareholder activism is marginal (Romano, 2000) might be right for certain cases, but the underlying assumption of this thesis cannot be generalised. The ambivalent reality was discussed in the previous chapters and is also reflected in the following chapters and case studies.

3.3 The effect of corporate social and environmental-oriented stakeholder activism on corporate technology strategy

Besides institutional shareholder activism, this thesis investigates the relevance of the impact of other stakeholders in trying to improve corporate social or environmental performance in the sense of a triple bottom line (TBL) approach through affecting corporate behaviour and policies (Jeurissen, 2000). The focus is on two major motivators currently driving such activities and interest. Firstly corporate environmental behaviour (CEB), in particular the issue of emissions which contribute to climate change and is a negative external corporate effect (Sarkar, 2008). And secondly corporate social responsibility (CSR), i.e. the implementation of socially-oriented elements in companies (Valor, 2005) as another core part of company policy.

The extent to which these specific motivators incorporate direct or indirect technology elements that consequently influence corporate technology strategy is an interesting not yet studied aspect of this research project (Hall et al., 2014). When technology elements are present, it is crucial to understand the mechanisms by which the technology strategy of a business actually is impacted. Additional clarification is required as to whether corporate effects originated by CEB-driven stakeholder activism differ from CSR-driven activities and if the consequences are similar or even the same. The stakeholders in this context are individuals, governmental organisations, non-governmental organisations or any kind of community with a common interest (Valor, 2005).

These stakeholders have various options for making themselves heard by the companies they are targeting and influencing their private politics¹¹ (Baron and Diermeier, 2007). One of the most frequently used “standard” channels is active participation at annual general meetings. One-to-one meetings of a stakeholder with corporate management are rare as in general a stakeholder does not have a major share package (Campbell et al., 2012). Prominent examples are organisations or communities like Greenpeace, which are even prepared to undertake illegal action, so-called campaigns, to get public attention via the media. Pirate activity of this type, which typically targets a company or a complete industry to confront it with a specific issue (Baron and Diermeier, 2007) can at first sight be seen as inappropriate in today’s culture.

Such campaigns often break the law. Illegal behaviour of this type is not a method to change things that would come to most people’s minds, but the effect is often extraordinary and in direct correlation with how whacky and risky the activities actually are. When the media reports on campaigns, the rocket has been launched, meaning either the broad public or prominent people are sufficiently impassioned to get on board and raise their voices in support of the campaign initially started by a few individuals. In such cases, it may be concluded that a few individuals representing organisations do a lot of lobby work to make the public aware of specific issues, such as greenhouse gas emissions, to initiate or boost social movements (Reid and Toffel, 2009).

As outlined previously, in the end it is often the consumer or end-user who finally puts the pressure on corporations by ostracizing specific brands or

¹¹ Private politics address situations of conflict and their resolution without reliance on the law or government. Methods include political competition over entitlements in the status quo, direct competition for public support, bargaining over the resolution of the conflict and the maintenance of private agreements. The term private means that the parties do not rely on public law or the courts. The term politics refers to individual and collective action in situations in which people attempt to further their interests by imposing their will on others. BARON, D. P. (2003) Private Politics. *Journal of Economics & Management Strategy*, 12, 31-66.

products (Baron and Diermeier, 2007) and this is typically sparked by non-shareholder stakeholder activism. This mechanism of influence is very effective, but complex as it relies on subsequent causal effects to reach the target. In general the activism intended to create awareness for corporate social responsibility and the activism on the effects of corporate emissions on climate change are very similar and both bear significant opportunities and risks (Hall et al., 2014). The starting point around which activities are built is always a specific issue with the target of motivating people to support the activity and creating pressure on companies or industries (Baron and Diermeier, 2007).

And the stakeholders having an interest in contributing to shaping the emerging fields of CSR and CEB as institutional entrepreneurs (Avetisyan and Ferrary, 2013) can, but must not be the same stakeholders. Activities or campaigns focussing on environmental or social related issues not only target corporations, but also those individual stakeholders who are seen as justifiable targets in the push for bringing about a change in attitude (Klein and Zur, 2009a). Such campaigns are often organised globally and attract media attention, including television. The results of such campaigns and the consequences for corporations are relevant to this research particularly when the effect extends to be a re-think by management teams on technology strategy.

Environment-related topics are often closely linked with technology, e.g. emissions affecting the environment are correlated with the technologies used by firms (Reid and Toffel, 2009). A reduction in emissions can typically be achieved by using fewer resources and by implementing newer, more efficient machines, equipment and processes (Colwell and Joshi, 2013). When corporations respond to activist campaigning by introducing more responsible policies, the effect can be the same as new government legislation. However, campaign success depends to a large extent on where in a business the activism is addressed, i.e. which people in the organisation it reaches (Delmas and Toffel, 2008). A business typically becomes actively involved in a campaign

to minimise or eliminate any unwanted effects on stakeholders or the environment only when it makes commercial sense.

And this can be the case, either when an improvement for stakeholders or the environment is positively correlated with the profit of the business, e.g. a production technology update reduces the production costs or stops a consumer boycott (Huang and Wu, 2010). What needs to be looked at carefully is what happens to the old equipment, whether it really is scrapped or merely transferred to another country where no confrontation is visible on the radar - and this is actually common practice for many global companies (Surroca et al., 2013). Another positive by-product of prominent businesses updating the technologies they use or their corporate policies is the pull-effect for other businesses in the same segment (Colwell and Joshi, 2013).

Such follow-on effects can turn a situation from one where the pioneer company might have had a slight competitive advantage over its competitors to a situation where the majority of companies follow and the few who do not get on board are kicked out of the market shortly after (Zahra et al., 1995). In terms of effective private politics this would be the best possible result, as it would change not only one company but also a complete market (Sarkar, 2008). Campaigns can and often do influence corporate technology strategy. While corporate social responsibility has a lot of internal elements that are not technology related, such as dealing with employee issues, a lot of the environmental-oriented activities impact corporate technology strategy one-to-one.

3.4 Further implications from the secondary literature; focus and fieldwork

Current literature is rich in information about stakeholder and shareholder activism and how corporations are changing due to stakeholder and shareholder influence (Mishina et al., 2012). However, what is unclear so far is

how and why things are actually happening in companies with shareholder influence, and this cannot be analysed with the published figures. In the previous chapters, two major factors of influence were reviewed based on the existing data and evidence. One is the involvement of shareholders who have, by law, the right to be involved in the development and decision-making processes in the organisation. Utilisation of their shareholder rights affects the businesses concerned and correspondingly the area of technology strategy, which is the core focus of this work.

Additionally, stakeholder influence can result from social or environmental activity. This can also impact technology strategy. The risk is high that incorrect conclusions may be drawn regarding the triggers for changes in the technology strategy of companies, simply because of the variety of influencing factors that have often not been recognised or understood. As only a very limited number of people are actually involved in these processes, it is unsurprising that little is known and in order to understand more the first-hand insights of these people are required (David, 2001). To avoid coming to false conclusions, it is crucial to have a good, case-specific understanding of all the relevant parameters and influencers and an acceptance that a state of 100% information and knowledge can never be reached (Floyd, 1995, Gill and Johnson, 2002).

A very good example of how incorrect implications are reached is the private politic actions to pressure companies or industries over specific issues. Corporate changes may be incorrectly interpreted when at the same time a finance investor was involved, a governmental policy was put in place or an incentive was introduced for investing in new technologies. If defining the real trigger for a change is difficult for an insider; it is near impossible for an outsider given the lack of transparency regarding all impacting factors. The mechanisms enabling the stakeholders without a dominant share package to influence management decisions, which have been discussed in current literature and which have already in part been analysed, are mechanisms that are visible to the public.

These are mainly different forms of direct confrontation. One option is a speech at an annual general meeting or a proxy vote, when other stakeholders and the media support a request (Romano, 2000). Another option is the planning and conduct of activist campaigning where the media has an important role (Baron, 2009), as discussed in the previous paragraph. In both cases the chain of desired effects ends when other stakeholders support the activity and pressure on the corporate management team is increased (Park and Tonello, 2009). The advantage of these strategies is that neither requires a dominant shareholder. These mechanisms are not directly, but indirectly effective when it comes to technology decisions (e.g. requests regarding CEB). Furthermore the cause and chain of effects are relatively obvious and can be analysed with relative ease, possibly polishing the CEO's image (Lewis et al., 2013).

Another effective measure, for which there is evidence, is the implementation of coercive government measures (David et al., 2008). Again, while global companies do sometimes choose to reshuffle their global footprint by taking advantage of countries with less restrictive regulations (Sarkar, 2008), evidence does exist for stakeholders influencing firms' behaviour, management and technology strategy and also cases where stakeholders are included on the corporate board of directors (Sánchez et al., 2011). The difficulties involved in extracting information about this form of interaction are relatively low as a group of people is always involved. An effect unwanted by all stakeholders is when corporate executives make concessions in response to stakeholder requests, in reality not to accommodate them, but to support a private entrenchment strategy of their own (Cespa and Cestone, 2002).

Uncovering hidden agendas such as this is one of the obligations of the board of directors. But such things are generally not visible at first sight (Surroca and Tribò, 2008). What remains an unknown is what exactly is going on when large shareholders have direct access to corporate executives (Shahzad and David, 2010). When requests or commands are responded to, it is typically done in a discrete and straight forward way out of the public eye (Klein and Zur, 2009a).

The direct effect of involvement of this type, as well as the indirect influence originating from, e.g. internal control or delegation of authority mechanisms have not yet been studied or analysed in detail. This is however a crucial element in correctly understanding and interpreting corporate changes made due to investor involvement and minimises the risk of misleading data or insufficient knowledge and understanding of other influencing factors.

Being entirely clear about all the influence parameters and understanding the interactions between the stakeholders is very important. It is crucial for the researcher to develop the right feel for each individual case and situation so that the right questions are asked and appropriate data and information collected (Yin, 2003). If the information is found to be asymmetric, a systematic has to be found to reveal the underlying reasons for divergent data or the motivation for divergent statements. Conflicts that cannot be solved within the framework of the research will be mentioned explicitly in the conclusions of the specific case and also in the summary. In this sense, selection of the right research methodology is decisive.

3.5 Gaps in the current knowledge base

An important issue not yet answered by present evidence is, what are the channels through which institutional investors become involved? There are a variety of ways to interact, but few of them are publicly accessible. Scientific analysis has therefore rarely been carried out. Participation at annual meetings where there is the chance to speak is a frequently used method, but one that in most cases is not very specific as it follows a general populist approach (Jochims and Reuter, 2006). Immediately after the acquisition of a dominant share package, it is evident that institutional majority shareholders establish direct contact with the management in order to exert influence and negotiate in corporate meetings off stage (Byrne, 1999, Nisar, 2005, Gillan and Starks, 2003).

Detailed insights about such exchanges are unknown and have not yet been studied within the framework of a scientific project. Face-to-face or small group meetings are the best choice for delicate or important exchanges in a business context and the same applies to the investor investee context (Lin and Yang, 2012). A common practice when personal meetings with the company management have not produced the expected results is to contact board members or external advisers directly in a second level of escalation (Useem, 1996, Nisar, 2005). Taking into consideration all aspects and areas of reaction and interaction, the situation is very complex and non-transparent. There are cases where investors know before the acquisition of a business or part of it where they have to act or interact or whom they have to fire or bring on board (Jensen and Ruback, 1983).

But there are also cases where it is not that clear where involvement is needed to lift potential by solving agency conflicts or to initiate and speed up learning processes (Karpoff, 1996). Who the people are who are involved in the exchange and how frequently they communicate or interact has not been analysed in depth and the evidence which does exist is based on secondary analysis. For the mature businesses that are the focus of this work, it is still widely unknown what kind of engagement is really carried out in practice to fulfil investors' expectations by initiating appropriate company reactions (Baysinger et al., 1991, Tihanyi et al., 2003, Belloc, 2011). Most of the knowledge developed by other researchers is about start up companies and venture capitalism.

Current research has found that transient¹² institutional investors affect tactical actions such as product pricing or the HR strategies of businesses in which they invest, but focus less on strategic actions – the opposite behaviour is found for

¹² Transient institutional investors do not focus on specific segments for their investments and often hold smaller stakes, with a short-term oriented and more tactical approach PORTER, M. E. (1992) Capital Choices: Changing the Way America Invests In Industry. *Journal of Applied Corporate Finance*, 5, 4-16.

dedicated¹³ institutional investors (Connelly et al., 2010). These findings confirm that investors act in dependence on their investment horizon and philosophy (Yan and Zhang, 2009, Munari et al., 2011). Correlations with strategic actions were found with regard to adjustments of the marketing mix, definition of a build strategy, but nothing focussed on R&D, even if some investors would have the power to do so. What is unfortunately kept out by most researchers is how any influence actually takes place, no matter whether the targeted impact is tactic or strategic.

The ability to influence strategic actions is seen more with dedicated investors due to their specialisation and experience, while transient investors act less selectively in terms of business focus (Bushee, 2001). Herding behaviour occurs when dedicated investors exchange with other investors who are active in the same area about what actions the executives of their companies should pursue (Gutierrez Jr and Kelley, 2008). Such cooperation can influence and maybe irritate the full market, when the investors hold shares in dominant players. Nisar evidenced two start up cases where venture investors had significant expertise in the business sector in which they had invested (Nisar, 2005). They had intervened in the management decision processes at firms in which they invested to the benefit of both the investee and the investor.

In these cases no negative effects of investor activism were found, in fact the financial funding and support for organisational development generated very positive effects for the businesses. The technology strategy followed was defined by the businesses with the close involvement of the investors, which was vital for the success and positioning of the businesses. The benefit for start-up companies in these cases was far beyond pure financial support. It included considerable knowledge transfer in the different areas of organisational development and confirms that venture capital investors often act as coaches

¹³ Dedicated institutional investors focus on a limited number of specific investments where they have a higher amount of shares and follow a long-term and strategic approach Ibid.

and consultants (Baum and Silverman, 2004). In other words, the involvement of active investors pushes evolutionary processes in early stage companies.

This thesis intends clarifying whether active institutional investors influence mature businesses in the same way. Each relationship between a finance investor and a company is as different as one company is to another (Belloc, 2011). To understand the roles that institutional shareholders play, it is vital to develop a better understanding of their capabilities and their approach and willingness for active engagement. General explorations of the cooperation and interaction between finance investors and their investees have already been made. Specifically in the R&D area, however very little scientific evidence has been available so far (Rehbein et al., 2004, Baysinger et al., 1991, Munari et al., 2011). Existing work is based on secondary data including fact and figure analysis with heterogeneous results (Grossman, 1999, Becker-Blease, 2012).

R&D intensity is measured by the number of new product launches, R&D spending or the number of patent registrations (Choi et al., 2012). A very interesting piece of work is “The Role of Activism by Institutional Investors in Influencing R&D” by P. David et al. (2001). This research project was a longitudinal analysis of 73 large firms over a time span of 7 years with institutional investor ownership. The project examined the correlation between R&D inputs, R&D outputs and shareholder activism. The project was based on secondary data from reports and databases and the application of statistical methodology. The conclusion of that project was that institutional investor activism correlates positively with both R&D input and output.

As investor activism is a quite recent, but complex phenomenon, more research needs to be carried out to gain further knowledge and evidence with a focus on technology and innovation strategy (Belloc, 2011, Chizema, 2011). As yet, no qualitative research has been done to uncover the mechanisms of interaction between finance investors and firms in their portfolio that influence directly or

indirectly the technology strategy (Le et al., 2006). The inside view that gives an understanding about how things are changed and affected due to investor involvement is missing, while the evidence about what happens and which areas are effected is extensive. It appears that moving beyond statistical fact and figure analysis to understand what is going on behind the scenes, either has not attracted other researchers so far, or no method of access has been found to do so successfully.

Closing this gap will enrich the scientific body of knowledge in many ways. It will bring more transparency to the interaction between investment funds and the companies in their portfolios. Subsequently, there should be a better understanding of the extent to which investors play a role in the corporate landscape and economy. This is important to re-confirm or re-open discussion on previous research into investor involvement. Last, but not least, all insider information is crucial in adjusting and improving policy-making aimed at ensuring fair competition with equal chances for all players in the market.

3.6 Definition of research questions

A core question to be answered is whether finance investors aim to influence directly the technology strategies of companies in their portfolio (**RQ 1**). Linked with RQ 1 it is crucial to understand which possibilities active shareholders can and do use to exert influence. A look behind the scenes has to deliver insight into the methods and tools used when investors interact with firms in their portfolio (**RQ 2**). A factor that strongly correlates with how information and data is exchanged is the frequency and regularity of exchange between the parties (**RQ 3**). A suitable research project that delivers data for analysis had to be defined and carried out to follow this approach. The planned contribution to the knowledge base of shareholder activism is not general, but focused on the area of technology strategy as one of the key elements for company success and long-term survival (Pegels and Thirumurthy, 1996, Zahra et al., 1995, Burgelman et al., 2008).

In order to understand the interaction and potential influence on technology strategy at the businesses, a deeper dive into the scene of interaction is vital (Baysinger et al., 1991). One of the most fundamental points to be clarified is how much expertise asset managers, i.e. the investment companies really have in the business fields of their investments **(RQ 4)**. In consideration of these deliberations, an interesting question to answer is who is considered to be the expert in technology strategy on each side **(RQ 5)**. Understanding to what extent an investor buys expertise from third-party advisors and analysts is complementary, but fascinating add-on information. At the beginning of this thesis, it was stated that all stakeholders influence evolutionary processes in businesses.

The logical expectation would thus be that the involvement of active investors has an influence on the processes of learning and evolution in companies **(RQ 6)**, bearing in mind that the size of a share package determines shareholder rights and authorisations to some extent (Davis and Thompson, 1994). The underlying aim of the research is to develop a better and deeper understanding of all correlated processes, interactions and effects as these are still controversial (Kochhar and David, 1996).

In conclusion, the research questions to be answered by the evidence produced by this thesis are:

RQ 1. Do finance investors aim to influence directly the technology strategy of companies in their portfolio?

The answers to this research question should reveal whether the investor has the intention to actively influence decisions regarding technology strategy decisions or not. Involvement in other areas that affects the technology strategy of the business would not be considered as direct, but as indirect influence.

RQ 2. How does the exchange between finance investors and the companies in their portfolio function (methods, tools, people involved...)?

The case studies should provide an understanding of the scenery and conditions under which exchange between active shareholders and portfolio companies, i.e. the corporate management happens. Whether the procedures and practices applied are similar in all cases or whether significant differences are observed will be one of the key outcomes. This should make it clear whether active shareholders act individually and specifically, in consideration of the fact that each organisation, its situation, capabilities and potential are individual, but never equal.

RQ 3. What is the frequency of exchange between finance investors and the corporate management?

The frequency is expected to indicate the intensity of the interaction, regardless of the tools and methods used to communicate. When the frequency is harmonic for all cases it can be assumed that it is a standard routine. If large variations are uncovered, then the individual situation of the case study firms will be analysed to identify possible correlations such as financial performance.

RQ 4. Do finance investors have the expertise to define the best technology strategies for the companies they own?

If an investor has the expertise and capabilities and if they want to oppose decisions regarding technology strategy made by the portfolio company's top management, it is nonetheless unclear why the investor's wishes and not the management of the company should take priority. This question should clarify which roles active shareholders can fill and to what extent they are capable of guiding the businesses in their portfolio with regards to technology strategy. It shall also uncover the limitations of active investors that they recognise themselves and also the limitations seen by the corporate management teams.

RQ 5. Who do both parties (investment company and company management) consider to be the experts in technology strategy?

If an active shareholder's behaviour is dictatorial, this appears only to be justified when they clearly know better than the corporate management. This appears implausible, as the company management should be the true panel of experts in that area. The views of the individuals should contribute to the understanding and explanation of investor behaviour and activity.

RQ 6. What is the finance investor's role in the organisational learning process of the companies in their portfolio?

If it is assumed that an investor exerts influence, no matter to what degree, the effect of that influence should be visible in corporate and organisational learning processes. Exactly what the explicit effects are and what this means in the consequences for the individual businesses will help to understand the influence that active investors do have on businesses and the economy on a broader scale. The research questions listed above pin down what the core area of this research project is. The questions should be answered by the results and insights gained from the research project that follows in the next chapters. It is crucial to develop a broad and comprehensive understanding of each individual case in order to produce sound answers, avoid misinterpretations and incorrect results. While the scope of the data collection is as wide as possible to capture the maximum information and insights, the following step of analysis and extraction is decisive in reaching the correct conclusion.

3.7 Analytical framework and dimensions

It is mission critical that the analytical framework to answer the research questions is properly defined (Gill and Johnson, 2002). This includes the definition of the analytical dimensions which are at the core of the fieldwork (Schnell et al., 1999, Yin, 2003). It starts with a confidentiality guarantee for the interviewees in a bid to ensure no information is hidden or embellished. It

continues with case-specific information about the interviewees, their background (general and in the company for which they are currently working) and the companies involved. This data is helpful for later analysis and comparison between the cases, especially when conflicting information is received. In addition to the research questions, the following information is required from all interviewees to be able to answer the research questions.

One of the first things to be clarified for each study case and each individual is who is communicating with whom, with which frequency and about what. With this information, the individual rules and regulations regarding delegation of authority can be identified. These are correlated with the frequency of communication. From the scientific point of view the communication methods, tools and channels are equally important as the content of the communication, and are a good indicator of intensity and specific preferences regarding communication. To understand the roles that the interviewees actually play and how other stakeholders see them, it is necessary to collect information about their specialisation in the industries or regions they work in and when/from whom they acquire additional expertise or know-how when it is required.

This can mean the involvement of third-party consultancies or people from personal or professional networks. There then followed questions getting to the heart of the research topic, that is the importance of technology strategy for individual people, their personal involvement and the sources of information and advice they make use of both inside the outside the business. A vital input for the analysis of the research results is information about interdependencies between departments, disciplines and regulations that may have impacted definition of the technology strategy. This can be, for example, budget decisions or the application of specific processes and tools. Differences between stakeholders and the way how they are seen by each other (consultant or just controller) help to understand and interpret cultural differences and their consequences.

Last but not least, it has to be asked how far the information divulged during an interview is hidden, filtered or embellished and what motivates such behaviour. The all-important closing question is which other people the current interviewee could recommend to be contacted for an interview. All the elements under investigation can vary a lot from case to case (Kaufmann, 1999). Subsequently, using a methodology allowing identification of divergences between the individual cases is very important (Yin, 2003). Any judgement of the outcome of the case studies can only take place after all the case studies have been concluded and cross checks between the cases run. This ensures consistent evaluation and interpretation of the case study results and reduces the risk of misinterpretation (Mason, 1996).

For the fieldwork, it means that all the relevant dimensions outlined in this paragraph need to be reflected in the guidelines for the semi-structured interviews and individually supplemented during the interviews to extract the maximum from each interview. Each situation and person is different and so are their perceptions and views about situations, processes and the world as a whole. Finding an empathic connection with each interviewee is the key to gathering data and information that cannot be accessed by a strict, structured interview with exactly the same questions asked in the same order.

Chapter 4 Research design and methodology

This chapter is dedicated to understanding the interaction between institutional investors and companies they own, in order to gain an insight into the processes and systematic that are typically involved in such relationships. One of the core targets of this work was to establish clarity regarding the expertise and involvement of institutional shareholders in the technology strategy deployed by companies they own, which also covers all the mechanisms of interaction between the parties. The technologies can be applied in the production processes, they can lie in marketed or semi-finished products that are used internally and they can also have a strong correlation with a specific sector or market. In the example of GEC that was mentioned in the introduction the chosen market and the technology were closely related. For this thesis an influence in the corporate technology strategy via a market decision would be considered but only as an indirect trigger.

4.1 Methodology definition and case study preparation

The initial groundwork for the research used all the secondary data available relating to the research topic. There is a lot of literature and data on stakeholder activism, finance investor involvement, corporate governance and other areas of the research topic chosen for this thesis. Besides the sources for the literature review (see paragraph 3.1), the following information on the companies and investment funds was used to prepare for the interviews:

- Annual reports
- Corporate newspapers
- Corporate websites
- Corporate press releases
- Corporate information packages for investors
- Investor websites
- Other publications available on the internet (news, magazines, ...)

A condensed package of data and information was prepared for each case. This included size (revenue and number of employees), markets served, global footprint, annual R&D spending, stock of patents, annual patent filing, financial and other KPIs. Data collection began about 6 months before the first interview took place and continued up until the last interview, to ensure the information about the business was up-to-date. Historical data from up to 5 years ago was included. This analysis sometimes made it possible to deduce why an investment fund became involved. In some, but not all cases, the literature even included statements by the investment fund stating the reasons for the investor involvement. It is equally important to understand what type of investor the investor is and their intention and role in the specific investment.

The duration of investor involvement and the evolution of the firm's performance in this period is also helpful information, but not always available. Looking at the details of the results published by individual researchers produced a good framework which could then be supplemented with new findings generated by an advanced research project. A good understanding of the available data is vital in ensuring the right approach is taken to contribute further to the topic. The research questions address a gap that currently exists, this is confirmed after the detailed literature review, summarised in the previous chapter. The statistical evidence already available in the form of quantitative research about general institutional investor activity with regards to R&D (David et al., 2001) is a good starting point, even though the mechanisms of direct interaction that drive the actual measurable influence on R&D have yet to be exposed.

However, a research project in greater depth, focusing on the direct interaction between the leadership teams of both the investor and the corporate management was needed to close this gap. The results of this research project could be used to verify the numerical data analysis already done by other researchers, as the approach and target outcomes are different. The decision on whether a qualitative or quantitative approach was more likely to produce the necessary information in the required quality and amount was straightforward.

As each company's relationship with its stakeholders is individual, the research project needed to deliver insight into the micro-level of interaction between the stakeholders in all forms of interaction, regular, irregular, verbal and written. It would be unrealistic to expect that communication follows a standard format, a lot of exchange is situation and topic dependent.

It's in the nature of the beast that in some case studies divergent characteristics were found which required a different methodology. In order to extract sufficient information and to understand the mechanisms of interaction an exploratory methodology was necessary so the work was not just a summary of existing data, but also a contribution to the scientific knowledge database in its own right. In other words, the method of choice at this point had to be the qualitative one. In view of this and other facts, the methods available to choose from were actually limited. After a careful review and discussion with the supervisors, the research method most appropriate for this project clearly had to be case study research. This method ensures that maximum insight is gained through the flexibility and room for adaptation inherent in the individual scenarios being studied.

Ideally, case study research is based on personal observation. This was not possible, as the access to high-level meetings could not be granted to the extent that would be required to produce the necessary information. All the parties who contributed to the project confirmed this. The second best, but in effect only feasible option, was to conduct personal interviews with the people who are actually involved in the processes. A semi-structured questionnaire appeared to be a solution to allow the interviewees to be guided and also allow them to describe in detail their specific situation and experiences (Gill and Johnson, 2002). The target subjects were the asset managers of institutional investors and senior executives of businesses in their ownership. The extent to which other people involved in the process could also deliver valuable information was one of the things that only became clear after the project had begun and the first interviews had already been conducted.

Due to the complex environment affecting each individual finance investor ⇔ company relationship, each situation or case is entirely individual and unique. Subsequently the number and kinds of people who can provide a detailed insight into the cooperation and interaction between the finance investors on the one side and the corporate management on the other side can be expected to vary from case to case. Thus it was important to find a good balance between a structured, equivalent and replicable way of working and to maintain the required sensitivity and broadness to identify areas, activities and people who could make a positive contribution to the research project. Flexibility was a must to guarantee that the maximum amount of information was obtained from each individual case and person.

Before starting the research project, all the available secondary data was analysed and evaluated. The results are summarised in chapter 3 in the form of a literature review. They represent the fundament of this research project. This sets the scene for the actual design, corresponding methods and procedures of the research. The design of the questionnaire was based on the knowledge and information collated from the initial analysis of secondary data. The interview was more of a guided conversation than a strict question and answer session (Yin, 2003). The ability of the interviewer to achieve a positive and comfortable atmosphere is an important skill that is highly important for the quality and amount of information that can be produced from an interview (Yin, 2003). The person being interviewed should be able to talk as openly as possible and it is the responsibility of the interviewer to note down all the relevant data produced by the interview.

4.2 Final content of the interviews; planning of the analysis

The interviews were all based on the same set of questions. The interviewees were free to stray from the central question. The following questions were designed to produce a cluster of responses, allowing identification of similarities interdependencies and both convergent and divergent phenomena:

0. General data: (a) Industry - firm, name, position, how long with firm? (b) Investor firm, name, role, age + experience?
1. How often do investor and investee communicate?
2. Who (position/responsibility) communicates with whom?
3. Which communication methods are used (e.g. email, phone, personal meeting, ...)?
4. Are reports made regularly? If yes, what is the rough content of the report (key figures, projects, ...) and who prepares/receives it?
5. Do your asset managers specialise in specific sectors, markets and/or products? If yes, what is the reason/justification (experience, expertise, individual interest, ...)?
6. When do investors involve or request 3rd party know-how and/or advice? Who is or who can be the 3rd party be (specific division of investor, independent consulting company, ...)?
- 7a. How much do investors care about the technology strategy of their portfolio companies?
- 7b. If they influence the technology strategy, on which basis do they do that (legitimation)?
- 7c. From where do the asset managers receive their information (business analyst?, ...)
8. What is the link/relationship between marketing, organisation, finance strategy influence of an asset manager and influence on technology strategy?
9. Which tools can/do investors use to measure/judge whether the technology strategy of a portfolio company will be successful in the mid- to long-term?
- 10a. What can investors do to influence their portfolio companies' technology strategy?
- 10b. What are the mechanisms/dynamics of influence? Do managers restrict information – if yes/no – why?

10c. Are all investors (and asset managers) the same or are there differences between them?

11. Is the technology strategy indirectly influenced by, e.g. budget decisions?

12. Do investors act as consultants concerning technology strategy and organisational learning? If yes, what are the consequences and results?

13. Are there cultural differences between different investors?

14. Can you recommend other people whom I could interview?

This set of questions was developed in conjunction with the tables used to illustrate the results in chapter four. There was a predefined set of sub-questions for each question, so that an answer which initially delivered insufficient information could be probed by adjusting and extending the questions until a complete answer was obtained. The decision was made to supplement the text with tables and give the reader a quick comparison of the key outcomes. Each table summarises the answers to one question. The condensed answers allow comparison and analysis across all the study cases. In addition to the individual questions, the cases were screened for convergent and divergent results; as well as isolated findings, which could deliver extra information for the study.

4.3 Case study execution

Before the final research work began, a pilot project was carried out to test whether the chosen methodology and research plan were appropriate and sufficient to answer the questions posed by the project. The investigation is likely to catalyse ideas and provide motivation for further quantitative research. A wide range of secondary data analysis covering stakeholder activism, corporate governance and organisational learning combined with the results from case studies for this research ensured that high-quality scientific data was generated. The interviews were all conducted in the same way for the different stakeholders so that by applying the matched method to each individual case

and a subsequent synthesis across all cases, divergences became visible immediately.

It was clear from the beginning of the research project and confirmed during the secondary data analysis that a lot of divergences would be found in the study cases and that these would need to be understood and explained. Consequently analysis of the results was equally or even more important than the preparation and conduction of the interviews (Mohrman and Lawler, 2012). For all divergences found, explanations had to be found and root causes defined to ensure that the right conclusions were drawn. In the same way, when the results validated each other, it was still necessary to see whether the underlying reasons and driving factors were convergent or whether different factors accidentally produced the same result or whether the “interviewee’s intention” produced the same result.

Evaluation of the interviewee’s openness und trustworthiness is something that cannot be measured objectively without subjective influences. But a good gut feeling helps to interpret non-aligned statements from different people and contributes to a broader understanding of the mechanisms and interdependencies between different authorities ((Kempster, 2009)). It is unlikely that all interviewees will talk openly about any hidden agendas they might have, but a few indirect questions can uncover a lot that would remain invisible in direct conversation (Mohrman and Lawler, 2012). A prerequisite in ensuring that the deductions made from the interview answers have considered all the relevant influencing dimensions is the definition of all those dimensions. Such dimensions are quantitative dimensions, for example, the age of organisations under analysis, their size in terms of annual revenue and number of employees (see table 2) and their ownership structure (see table 3).

In some cases things appeared to be simple at first sight, but then when the complex interaction of different stakeholders, different company policies,

different products, etc. was considered, incorrect initial assumptions meant that potentially specific characteristics of a case had not been brought to light. In such cases there was no option other than to dig into the details and conduct a complete portfolio of analysis before a conclusion could be confirmed. When rival explanations for the same results were found, the analysis had to be re-done and re-focussed (Yin, 2003). In three cases, a second round of analysis or interview was required when conflicting arguments could neither be confirmed nor aligned and for this the interviewee(s) had to agree to further interview, which again took several weeks time.

Developing models for individual cases and then applying them to other cases with iterative adjustments (Schnell et al., 1999) based on the data matrixes summarising the relevant variables turned out to be helpful in reducing the complexity of this multi-case study project. This proved to be a very useful tool in looking at processes, delegation of authority and the impact on the technology strategy of companies, while simultaneously justifying the condensation of the relevant facts and figures. While in the beginning it appeared to be a major challenge to get sufficient data for analysis, later the challenge was in the opposite – namely how to filter for the right and relevant data.

4.4 Identification of interview partners and the interview process

One of the first steps in the project was to understand and define who the right people to interview were. It is clear that the most valuable and accurate information about the businesses will come from the CEO or the people in the first management line. These people are in touch with the investors and are directly involved in the interaction and decision making process. On the investor side, asset managers and other people who are in direct interaction with the companies were also targeted for interview. Identifying suitable interview partners was one of the first major hurdles, as not every investment firm or

company website is transparent enough to allow access to their senior executives.

However, access is one thing and relatively easy compared to the next difficult step, which is arranging an interview. A suitable interviewee in the investee area had to have had experience with a couple of investments in which technology played a dominant role, either in the product itself or in the production or support processes. When it is difficult to gain direct access to a target person, there are bypass strategies that may result in access to that person despite the initial hurdles experienced. It can be helpful to build up a relationship and understanding of the research topic at the assistant level, that is, with someone who has direct contact with the target person. The availability of a free slot in the calendar of an executive can rapidly increase when their assistant is motivated to lobby for you.

This kind of lobbyist involvement is frequently used in business and has proven to be a successful approach for this research project too. The only disadvantage with this strategy is the additional time needed. However, if another interview time slot had to be arranged at a later date, the “network” already built up was often very useful. It is a sign of our times that people in senior management are nowadays overloaded with a daily bombardment of emails, meetings and conference calls. Thus initial reluctance or impeded access does not necessarily equate to a lack of willingness to support research projects such as this one. Nevertheless, such protection mechanisms had to be penetrated or by-passed to ensure there was maximum input into the research project.

This major hurdle was also a factor that affected the sample size. In theory there are hundreds of potential interview candidates out there, of whom the majority cannot be accessed or are unwilling to contribute. As time for most of the prospective interview candidates is their most rare resource, they do not

readily offer a slice of this to an unknown researcher. That does not mean it is impossible to find sources of information, but it was one of the most difficult and uncertain parts of this project and required the application of inventiveness and ingenuity to break through to the targeted interviewees. After identifying and then convincing suitable interviewees to be interviewed, the next tricky step was to generate enough trust to allow them to talk openly about their experience and knowledge.

Keeping all data confidential was a priority and this had to be guaranteed right from the start. It must always be kept in mind that the interviewee is entirely free to decide what to tell, what not to tell, how to explain and what to hide. Before the initial contact was made, all the available information about the company concerned, the person and the background were to be collected, analysed and evaluated. If data about a specific and related investment case was available, that too had to be studied and analysed as well. This basis allows communication with the interviewees to begin at eye level. There is no doubt that all interviewees appreciate the interviewer being armed with basic information and knowledge, to avoid starting with the very basics, but instead build on the information the interviewer already has.

4.5 Sample definition and description

The subjects under investigation are companies that are in the ownership of finance investors. Each action, driven either by the company management or the investor can potentially have a direct or indirect effect on any parameter of the company. Which parameters those are and which ones are relevant to this research project and the ones chosen for monitoring is discussed later. A company can be active in various areas and many of the parameters, depending on the area of activity, are at least partly predefined. In light of the subject of the research, it is obvious that only those companies active in an area in which technology strategy is of importance were elements of interest for in-depth analysis. Whether the technology is in the product or in the process does

not matter, as the question is not restricted to one or the other, but to technology strategy in general.

Having defined the area of activity required for companies suitable for the research sample, the next decision to be taken was how narrow the filter had to be. Does investor influence depend on the area of activity and is it subsequently necessary to focus on companies in a certain area? The assumption made for this project was no, it is not necessary to focus on one area. The reason for this decision was that in this analysis, the only thing of relevance was whether an investor was aiming to influence the companies in the area of technology strategy or not. The sources of information and support used by the investor are interesting from the helicopter view, but whether relevant information is obtained from consultant A or B is irrelevant. It is only important to know whether external expertise is used, all the rest was immaterial at this stage.

A further academic paper may be necessary to generate additional evidence. Does the size of a business influence investor effort or investment aimed at improving the performance of it? If company size always equals potential in terms of earnings or share value, the answer would probably be yes. However, small companies do sometimes deliver multiple ROIs that can scarcely be gained with large investments, thus company size does not matter. Whether the engagement lasts weeks, months or years is also not primarily important in answering the research question. As the complexity of a company normally corresponds to its size, the overall amount of effort that an investor may need to make is also equivalent to size (roughly speaking). But that is not the focus of this thesis.

The aforementioned facts suggested that filtering by company size was not appropriate. Much more relevant is the potential the investor expects to be able to convert into earnings for themselves. The conventions and corresponding regulatory framework of the investor's institution can predefine or limit the

options available to exert influence. When committees are installed to define on a consensus basis the direction of the technology strategy to be followed, the input and influence that an investor can exert is limited. When the committee members are experts in the area, even third-party expertise requested by an investor might be ignored.

When the members of the committee work part-time and are not fully dependent on their financial compensation they are more likely try to fight in line with their own conviction and not in line with the definition of their role. However, the opposite may be the case when an investor has the power to uninstall such a committee or even part of the company management, because of a mismatch in understanding the way the company should go. The age dimension of the portfolio companies was considered, but not seen as relevant for a company which was no longer a start-up and had reached a certain level of maturity. The sample was selected using a minimum age of 10 years as the threshold. Thereafter it can be assumed that the company is recognised and settled in the market.

In parallel, the market position, growth rate and product portfolio of the company were analysed in comparison to competitors in the same segment. This helped to confirm that the company had indeed found its place in the market and was not just a new star on the rise. Nonetheless the analysis investigated the findings for a correlation with the age dimension, even if this was not expected beforehand. In the area of finance, the effects and regulations of the capital market discipline are significant as they can play a major role in the decision making process with regards to e.g. the risk involved in an investment. For this specific research project, the effects of the capital market discipline were not of major importance. They have nothing to do with the capability an investor has to exert influence on the technology strategy of their investments, nor do they affect the possibility of introducing such know-how, if available.

The maximum effect would be a limitation in certain areas and something that could still be identified and analysed due to the flexibility of the research methodology chosen. The regulations regarding insider trading could not influence the outcome of this research project either, as possible limitations due to insider trading do not correlate either to competencies on the investor side or their influence and expertise within a firm. However, insider trading was a potential roadblock in the interviews with the company management of public companies. The interview partner might not have been able to talk openly about what is going on in terms of technology strategy, as they might have given an insight that would generate an advantage compared to other shareholders. This risk however, appears to have been minimum and not to have limited the outcome of this research as the questions were about the interaction processes only and not about technological details.

Press announcements about changes in companies' top management are often evidence of weak company performance. It is a normal process signifying that shareholders and stakeholders are trying to improve an imperfect situation. This fact could lead to the assumption that the same happens in the area of technology strategy. If a company is managing its technology strategy successfully, why should an investor be involved? On the other hand, if a company is struggling in that area, is an investor likely to know better than the company management about how to improve the situation? The assumption for this research was that an investor who has personal know-how or who is interested in the area of technology strategy would be involved in that field.

No matter whether the involvement is just to make sure everything is on track or to exert major influence, the mechanisms and actions are likely to be similar, independent of company performance and other actions that might be taken or supported by the investor involved. The ownership structure of a company is definitely a significant parameter in evaluating the extent to which external investors exert influence. Depending on the dominance of individual shareholders, the potential can be minimal or major. Minor shareholders, for

example, would find it very difficult to dictate the direction of the technology strategy when the CEO himself is a major shareholder of the company. This is actually often the case for companies that were privately owned before they went public.

For sure, the way in which an investor would try to influence decisions is different compared to the influence a private equity investor with 90% share in a firm would have. Nevertheless, a major point to be analysed in this thesis was whether an investor has the capability and interest to exert influence on technology strategy. Should this not be the case, then other questions about exerting influence become purely secondary. With regards to the structure and limitation of ownership, it should be said that some investors do not care whether their number of shares is significant or not. A few well-known people have been known to act aggressively and publish provocative unpleasant letters they have written to the company top management. Even if the content is entirely false or some accusations are exaggerated, for the people concerned, it can result in a loss of credibility in the public eye and cause a lot of stress.

Such behaviour and attitudes are the exception not the rule, but strong wording is an excellent eye-catcher for the “yellow” press and exposure to the broad public. The final selection of suitable interviewees was made via a database published on the website of the “German Private Equity and Venture Capital Association” (www.bvkap.de). All companies that were chosen had a strong link with technology and technology strategy. Verification extracted from the company websites and articles that the products of the firm as well as the processes are strongly dependent on technology drove the decision process. In total, 263 companies were contacted via email. Of the first batch of emails, 17 companies replied that they do not give any information about their investments to third parties.

Some 31 companies replied to the first email reminder (second round of interviewee contact), of which 6 finally sent positive feedback, whereas 25 refused access. In the third round, companies were called by phone with the result that more 8 said they were willing to meet for an interview. The final sample used in the multiple case study research, consisted of 14 cases, comprising expert interviews with finance investors and companies in their portfolio. At the pilot stage, the focus of the work was on getting a general insight into the interaction between finance investors and the businesses. For the pilot study, both an experienced asset manager and a CEO of a private equity owned company were interviewed.

The details of this are included in the company A and company B case studies, described in the following chapter. In total, 43 people from the 14 companies and finance investment companies were interviewed between 2007 and 2011. From the total number of interviewees, 26 had a leading role at a portfolio company and 17 were asset managers or portfolio team members.

Case	Number of interviews with portfolio company representatives	Number of interviews with finance investor representatives	Interviews in calendar year				
			2007	2008	2009	2010	2011
A	1	1	X	-	X	-	-
B	4	1	X	X	-	-	-
C	3	2	-	-	-	X	-
D	1	1	-	-	-	X	-
E	4	2	-	-	X	X	-
F	2	1	-	-	X	X	-
G	1	1	-	-	-	-	X
H	2	1	-	-	-	X	X
I	1	1	-	-	-	-	X
J	1	2	-	-	-	-	X
K	2	1	-	-	-	-	X
L	1	1	-	-	-	X	X
M	1	1	-	-	-	-	X
N	2	1	-	-	-	-	X
total	26	17					

Table 1 - Interview timeline

Case	Annual turnover in million EUR	Number of employees	Foundation year of portfolio company / age in yrs @ first interview	Products are commodities, innovative or both (mixed portfolio)	Technology and innovation is found in product, process or both	EBITDA level x as % of the annual turnover	Trend of financial performance
A	70	95	1985 / 22	innovative	both	10<x≤15	stable
B	1,000	8,000	1954 / 53	innovative	both	0<x≤5	negative
C	400	2,500	1953 / 57	innovative	both	0<x≤5	negative
D	60	300	1925 / 85	both	both	5<x≤10	positive
E	1,300	13,000	1988 / 21	both	both	10<x≤15	positive
F	500	4,300	1857 / 152	both	both	5<x≤10	positive
G	40	250	1956 / 55	both	both	0<x≤5	stable
H	110	600	1960 / 50	both	both	0<x≤5	negative
I	60	400	1607 / 404	innovative	both	5<x≤10	positive
J	370	3,500	1997 / 14	innovative	both	0<x≤5	negative
K	180	1,800	1882 / 129	innovative	both	10<x≤15	positive
L	110	800	1906 / 104	innovative	both	0<x≤5	negative
M	750	5,200	1902 / 109	both	both	15<x≤20	positive
N	1,100	3,400	1965 / 46	both	both	15<x≤20	positive

Table 2 - Profile of the portfolio companies involved in the interviews

The businesses are active in the areas of software, electronics, mechanical engineering and solar technology. The size of the portfolio companies which were analysed varies from 40 million Euro annual turnover and 95 employees to 1.3 billion Euro annual turnover and more than 13,000 employees globally. The age of the corporations varied from 14 to more than 400 years, with a median age value of 56 years. The following tables provide a detailed overview of the case characteristics. Further information can be found in the case studies that are included as appendixes. The shareholder structure is illustrated in the following table. In all cases a dominant shareholder with more than 50% of shares is involved, while in cases A and C the majority shareholder was not a finance investor but the company founder and family.

In all other cases the majority investor is a finance investor or a finance investor consortium. Free-floating shares were a feature of less than 5% of cases. Further information about the time of engagement of the individual investors and evolution of the businesses from foundation till today is included in each single case study report in the attachment.

Case	Single shareholder with >50% shares?	Dominant finance investor involved	No. of shareholders with a share package y in % of total shares $10 < y < 50$	% of free floating shares
A	yes	no	four	<5
B	yes	yes	two	<5
C	yes	no	zero	<5
D	yes	yes	two	<5
E	yes	yes	zero	<5
F	yes	yes	one	<5
G	yes	yes	zero	<5
H	yes	yes	zero	<5
I	yes	yes	zero	<5
J	yes	yes	zero	<5
K	yes	yes	one	<5
L	yes	yes	zero	<5
M	yes	yes	zero	<5
N	yes	yes	zero	<5

Table 3 - Shareholder structure of the portfolio companies involved in the interviews

4.6 Advantages of the selected research design

Because of the high number of relevant dimensions in this exploratory project, it would have been inadequate to conduct a pure quantitative analysis. To understand the complex relationship between companies and their investors with regards to technology strategy and to ensure that no relevant information was ignored or misinterpreted, it was absolutely necessary to collect and analyse qualitative data firstly. This was the only way to ensure that no relevant information was ignored or misinterpreted. The result of the doctoral thesis could in theory provide results that can then be used, applying a certain set of indicators, to generate quantitative data to broaden the analysis of the finance investor ⇔ company relationship.

It was decided that if during the work, a combination of qualitative information and quantitative information appeared to be beneficial to the quality of the work, then both could be combined without a problem. The flexibility thus gained is a highly valuable advantage of the research design selected. Furthermore the interview style selected, based on a semi-structured questionnaire, allowed the

interviewer to adapt the questions and the conversation to specifics that came up during the interview and appeared to be significant to the project.

4.7 Limitations of the research design

Two people were interviewed for the pilot project and it immediately became clear that it is firstly very difficult to get initial access and then even more difficult to set up a date for an interview. Both interview partners were very busy people so the meetings had to be scheduled several weeks in advance. This was not a negative experience, but generally this sort of person is very difficult to access without an introduction by a friend or network connection. After contact was successfully established, another important issue was how to use the limited time in the most efficient way. A comfortable atmosphere is important, but it can also limit the information obtainable, especially if too much time is spent on conversation about hobbies or general things that are typical warming-up subjects.

A remark about the prepared semi-structured questionnaire turned out to be a good way to return to the interview itself. In the run up to the day of the interview, it was vital to schedule sufficient time, not to forget how much effort is required to plan and carry out the interviews or to write up the collected information. Without good preparation for the interview, such as collecting information about the interviewees and the individual enterprises or investment cases, opportunities may be missed and the information obtained from the interview less than required. In general, the study was immensely challenging - particularly with regards to the individual cases and the different background conditions, which were essential to take into consideration. It is extremely helpful when an empathic connection can be made, but there is no standard recipe as all people are individuals and different.

Another aspect, which is of crucial importance to the interviewees, is confidentiality and trust. Most of the interviewees requested that neither their names nor the companies they were talking about should be mentioned in the thesis or in any publicly accessible document or file. The promise to codify all names in order to prevent identification of people or companies by an outsider at a later date was a key requirement in agreeing to be interviewed. Talking about this and convincing the interviewees that they can trust the interviewer was crucial in ensuring that the maximum amount of attainable information was harvested during the interviews. A potential problem was that the interview partners might give only filtered or even wrong information.

It is their choice to accept being interviewed and naturally they are free to say what they will – the whole story, just a selected part of it or even a sugar-coated version. This could lead to a false interpretation or false conclusions. Therefore, it was necessary to phrase the questions in such a way that valuable knowledge could be given, information which would give insight into the relationship of the researched parties, without asking questions that were too confidential. Mistrust in the interview phase, would have been poison for the outcome and had to be avoided at all costs. However, If an interviewee did go deeper than expected into details that were of interest, but specific and confidential, this was welcomed as a chance to gain the maximum amount of information.

4.8 Pilot project

The mandatory first step in the actual fieldwork was to verify that the chosen methodology, its tools, the preparation, the resulting data and information were in line with both the expected and required outcome (Gill and Johnson, 2002). To do this, it was decided to carry out an initial pilot study that would include all the activities, preparation and analysis planned for the main research project. Two people from different investment cases were interviewed for the pilot study. Before the first interview took place, intensive research about the interviewee, their background and their current role in professional life was carried out. In a

last step before the interview itself started, the interviewee was prepared by providing some brief information about the interviewer, the subject of study and some keywords linked with the topic.

From time to time during the interviews, a quick look at a document that listed some headwords as a mnemonic device proved to be extremely helpful. It became clear that it is very important to be flexible enough to be able to come up with additional questions when the feedback and explanations given by the interviewee required further probing. This is the only way to collate the maximum amount of information. After the pilot project, some questions that had not been included in the first version of the questionnaire, but which developed during the interviews were added as lessons learned. The pilot study showed that the questionnaire needed to be updated to get a fundamental overview of the relationship under investigation and to enable deduction of correct and appropriate results.

Based on the detailed background information gained from secondary data, the discussions flowed well and did not stick because of a lack of knowledge or understanding on the part of the interviewer. The general experience from the pilot project was that the interviewees were very open to talk the experiences they had had with different types of investors or company managers. They expressed their personal views clearly and openly. Complex situations were described and explained in detail and with a great deal of patience, even when additional questions were asked to maximise the output and to investigate each and every aspect of the relationship. The questions just had to be specific and professionally addressed.

One of the interviewees commented positively on the good knowledge and understanding that analysis of the existing literature had given me and said that he had experienced interviews with people who did not invest sufficient time in preparing for the interview by familiarising themselves with the available data. In

such interviews he refused to spend time explaining things that could easily be found on the company website or elsewhere. It is a matter of respect and professionalism that the interviewer is as well prepared as possible. The most important sources for preparing for the interviews, apart from the company and person specific information, proved to be a small number of articles in journals, a bachelor thesis about investor activism and a number of articles about asset managers, CEOs, companies in the ownership of finance investors, investment companies and investment cases.

Chapter 5 Findings from the case studies

The following paragraph summarises the findings from all 14 case studies based on the questionnaire. This is followed by a conclusion and a discussion paragraph. The case study details are included as appendixes in the last part of this thesis. Specific information and results can be found there, however all the company names and interviewees' names have been codified, as requested by the interviewees at the time of the interviews. Furthermore, the interviewees required an undertaking that the details would not be made accessible to the public, only the examiners at the university, as the descriptions of the companies make it very easy to identify the companies and subsequently the people interviewed. This shall apply for a minimum of ten years after the official submission of the thesis.

Whenever possible, the outcomes of the individual questions from the questionnaire were illustrated with a table. As all the analysis followed a qualitative approach, not targeting any quantitative result, the questions in most cases could be answered with either a Yes or a No. This was to avoid the impression that numerical data was being collated, as this was not the intention in the pre-interview phase. The preparation and actual interviews were not designed to yield quantitative data. Nevertheless, a tabulated summary gives a quick and clear overview of the core outcome and as such is a good add-on for the aggregated feedback section.

5.1 Detailed summary of answers to the semi-structured questionnaire

The following findings were established by the manual screening, question by question of all data and feedback collected during the interviews.

1. How often do investors and investees communicate?

In all cases, both the investors and investees confirmed regular communication was standard. If shareholders do not have a dominant package, they cannot dictate the frequency or subject of the exchange. But still, some try to do so. If minority shareholders request information at short notice, an answer will only be given reluctantly by the portfolio company management, if an answer is given at all. This was observed in cases A and C. When an investor has a dominant share package they have the authority to decide when exchanges will take place and what the context should be. Feedback from the interviews confirms that this is the normal way of interaction between the investor and the company management.

The closest contact between investor and investee was seen in the case of company F, where the finance investor consortium, which had taken over ownership from the previous single private equity investor, installed a chief restructuring officer. This person was in permanent contact with the finance investor steering committee.

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Dominant finance investor involved	No	Yes	No	Yes										
Exchange between finance investor and portfolio company once per month or less	Yes	No	Yes	Yes	No									
Exchange between finance investor and portfolio company several times per month	No	Yes	No	No	Yes									

Table 4 - Frequency of communication between finance investor and portfolio company

In conclusion, it can be summarised that in order to be permanently up to speed, finance investors with dominant share packages typically meet the CEO of the companies monthly or bi-monthly, sometimes with the involvement of the

top management team. Minority shareholders have to be content with the minimal insight they are allowed by law (as accorded by the size of their share package). Finance investors who own majority packages have frequent exchanges by phone and email as well. On average, weekly communication by both phone and email is standard. The only exception in the cases was company D, where the standard frequency was only monthly, with on-demand exceptions. The on-demand exchanges were typically to get approval for investments or other decisions with impact on the finances.

Contact was much closer during specific phases, e.g. budget preparation, and the frequency of exchange with the dominant investor involved, higher in all cases. Furthermore, investors frequently join or support project teams at companies in their portfolio for a period of time. The most common objective of such projects is either to investigate and define actions regarding markets and product portfolio or to identify weak points in the organisation or the financial models used to evaluate business cases. Involvement can mean that a team is based at the portfolio company for the time of the project or the involvement can just as well be remote, by phone and email or as a back office function to analyse data. In all cases where the finance investor does not have a majority share package, personal meetings are scheduled for a maximum of once per quarter or twice a year.

This is because in such cases there is no actual investor involvement in the decision-making processes. Emails or phone calls are rare, on average less than once per month. In conclusion it is evident that the frequency of personal meetings as well as of other channels of communication correlates to both the size of the share package and the influence that an investor can exert by law on the portfolio company.

2. Who (position/responsibility) communicates with whom (investor/investee)?

The representative of the business, who leads the exchanges and joins most meetings in person, is the CEO. This was confirmed across all cases. CEO`s are also in the loop regarding all the other exchanges where they are not personally involved. They receive copies of the emails, meeting minutes and status reports from their teams who are in touch with the investor without their involvement. From the investor side, the asset manager plays the same role as the CEO of the portfolio company. In some cases, steering committees will have been installed with more investor representatives. This of course depends on the size of the portfolio company and the importance of decisions that have to be taken for the portfolio company or the investment firm as a whole.

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Dominant finance investor involved	No	Yes	No	Yes										
Portfolio company CEO leads the exchange from investee side	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other C-level members of the portfolio company are occasionally involved	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes						
Portfolio company members below C-level are occasionally involved	No	Yes	No	No	Yes	Yes	No	No	No	No	Yes	No	Yes	Yes
The exchange from the investor side is led by an asset manager	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other management members from the investor side are occasionally involved (e.g. a defined steering committee)	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes						
Other investor representatives such as portfolio teams are occasionally involved	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes

Table 5 - Overview of people involvement in the portfolio company <=> finance investor exchange process

For specific projects, an investment firm may also send analysts or portfolio team members to the portfolio company to support and closely monitor specific activities to ensure decisions are made in line with the targets and strategy of the investment firm. The only case where the investor placed a chief restructuring officer as a permanent leader in a portfolio company was case F. The instalment of a chief restructuring officer to report directly to the investor is a kind of last measure when fundamental actions cannot be handled by the portfolio company management itself due to limitations of knowledge or experience or when the investor does not have sufficient trust in the portfolio company management.

The leading role the company CEO and the asset manager take in the exchange process is homogeneously evident in all cases. Involvement of other C-level members from the company and a steering committee from the investor side was observed in all cases apart from G. This can be explained by the size of both the company G and the majority investor, as both were much smaller than those involved in the other cases in terms of annual turnover, and capital invested.

3. Which communication methods are used (e.g. email, phone, personal meeting)?

A personal meeting was the preference specified by all people interviewed for regular reviews and important decisions, and something that cannot be substituted either by email, phone or videoconference. Some decisions are not important enough to require both parties sitting in the same room where not only words but also gestures and facial expressions are exchanged during the communication. Face-to-face meetings are vital for different kinds of presentations such as budget presentations, important product presentations or human resource decisions when an investor has a share package big enough to grant him the right to be involved in such processes. It was very important for all the investors interviewed to have personal contact with the company top management on a regular basis.

From time to time visits to the production sites are on the agenda as well, but are relatively seldom. On average a maximum of once a year. The portfolio company management will always take care to prepare for investor visits to factories to avoid any negative surprises that could cause trouble and to deflect any embarrassing questions. Despite the advantages of personal meetings, the most common communication method is email, especially when the back and forth exchanges regarding a specific topic are also included in the count.

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Use of email	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Use of phone	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Use of personal meetings	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Most frequently used method	e/p	e	P	p	e	e	e/p	e/p	e/p	e/p	e/p	p	e/p	e/p
Preferred method for important topics (pm = personal meeting)	pm	pm	pm	p	pm									

Table 6 - Overview of confirmed ways for regular communication

Email is the best tool when a majority shareholder is involved in the approval process for investments or any other regularly recurring topics. The advantages of email it is easy to have more than one person in the loop and on the other hand it is not necessary to arrange an appointment in advance, as it is for a conference call. What does however often happen is that the investor is informed by email about an investment case, including the business case calculation, and then in parallel, further information is given by phone, so avoiding the inclusion of a long story in the email. For bilateral exchanges, the preferred and most dominant communication method is the conference call, because immediate interaction and discussion is much more effective than exchange by email.

4. Are reports made regularly? If yes, what is the rough content of the report (key figures, projects...) and who prepares/receives it?

Besides general communication via the different channels, a regular reporting system was in place for all the investment cases analysed for this research project. In the cases where the finance investors had no dominant share package, reporting was once per quarter or even just once per semester. The content of the reports is the same as that which can be found in the annual reports published by the companies, but lighter and without specific project or initiative data. This was found in cases A and C. The reporting tool is strongly influenced by the investors in the cases where one investor or a consortium of finance investors has a dominant package. This was evident in all cases except in I where the investor agreed to a one-to-one internal monthly summary from the C-level management.

In all the other cases with dominant investor involvement, information additional to the standard KPIs was requested such as turnover, the number of quality complaints, the book-to-bill ratio and the corresponding plan ⇔ actual comparisons. One very important area of reporting is the status of projects and initiatives, no matter whether these are new products or important product lines. In case B, the investor provided the portfolio company with a design of a project-reporting tool that looked like the instrument panel in a car. In case D, the portfolio company had some weaknesses in the production area that negatively impacted the overall efficiency of the production equipment. Thus the OEE (Overall Equipment Efficiency) was one KPI specifically requested for inclusion in the reports.

In case E, the focus for some time was on the result of pricing initiatives. In conclusion, it is clear that majority investors generally require a lot of information, but their requests are based on the current situation in the portfolio company. They generally then ask for further information or details to fully understand the situation and environment. This is important, no matter whether they intend to keep the investment for a long time or if an IPO or a sale is

planned in the near future. If the reports show a trend in either a positive or negative direction, the investor will question and re-evaluate how to continue with the investment. Top management in cooperation with all departments concerned prepares the reports. The recipients on the investor side are asset managers who will forward the reports internally for analysis by their portfolio teams and back offices.

All the data included in the reports is critical and may require short notice follow-up meetings for serious discrepancies or even when a negative trend is starting to be visible. Thus a CEO will review the content carefully before it is finally transmitted to the investors, regardless of the fact that all the parameters to be included in a report are clearly defined.

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Dominant finance investor involved	No	Yes	No	Yes										
Regular reporting?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reporting is designed according to finance investor's request (specific KPIs)	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes

Table 7 - Investor influence on portfolio company reporting

Sometimes the manager delivering the information might not foresee the consequences or reactions of the investor. Therefore minor modifications to the wording or care in the selection of the subjects is necessary and very helpful to avoid unjustifiably alarming the investors. Manipulation of the data however, is strictly forbidden.

5. Do the asset managers specialise in specific sectors, markets and/or products? If yes, what is the reason/justification (experience, expertise, individual interest...)?

An asset manager typically has at least some basic knowledge and experience of the sectors or markets in which the companies in the portfolio under their leadership are active. All the interviewees said in certain cases the asset managers did have detailed expert knowledge about products and processes, however no such evidence was found in the case studies for this research. In the cases G, I, L and M, selection of the asset manager was made independently of considerations of experience or expertise in specific markets or products, but only according to the size of the portfolio company, the legal form and the current performance. In other words, any information regarding technological changes or proposals provided by the portfolio companies was not assessed directly by the asset managers.

This is the major reason for the involvement of portfolio teams and back offices. These teams work to provide a benchmark in a comparison with other companies in the same markets. Generally, proposals for business cases and decisions of all sorts are prepared and presented by the portfolio company management. The investor steering committee then just decides YES, NO or REWORK. All the investors commented that they do not need to have expert knowledge down to the very last detail. Their area of expertise is to drive decisions based on data that has been collected and analysed by other people beforehand.

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Portfolio company activity (products, markets...) drives selection of the asset manager	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes
Portfolio company size/legal form/actual performance drives the selection of the asset manager	No	No	No	No	No	No	Yes	No	Yes	No	No	Yes	Yes	No

Table 8 – Factors that dominate the asset manager’s selection process for potential investments

6. When do investors involve or request 3rd party know-how and/or advice? Who is/can be the 3rd party (specific division of investor, independent consulting company...)?

The first time 3rd party expertise is utilised in an investment project is the pre-investment phase. This is when the finance investors have to evaluate the real value of the company and what they can and have to pay to get the business, but also how to ensure that it will be a profitable investment for them. In the pre-investment phase, the finance investor normally buys the third-party expertise whereas in the investment phase, it is regularly the responsibility of the company to pay for it. Third-party advice was used in the pre-investment phase in all research cases except C. After a finance investor has entered into an investment, they often recommend or even dictate which 3rd party has to be involved in which topic.

This is typically based on the often very long and extensive experience they have had with selected consultancies and institutes. Worth mentioning here again is the case of the company F, where a chief restructuring officer was deployed as a permanent 3rd party to drive the changes and reorganisation within a portfolio company on a global basis. In this situation, the top priority was to improve the most significant company parameters such as the EBITda, to make the company more attractive to both the current owner and any potential buyer. Although in the other research cases no one was deployed as a permanent manager at a portfolio company, the priorities were similar. Investors will often request the involvement of a third-party consultancy for major decisions, not because they are looking for a blueprint for the right technology strategy, but just to double check the business case and analysis already done by the portfolio company management.

This process frequently happens in parallel, meaning third-party experts are involved in the analysis and business case preparation, so the investor already has the guarantee that the evaluation is objective and based on the best

available knowledge. Evidence for this was found in all cases where dominant investor involvement was present, but not in G or I.

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Dominant finance investor involved	No	Yes	No	Yes										
Third-party expertise is used in the pre-investment phase	Yes	Yes	No	Yes										
Third-party expertise is used for specific business cases involving e.g. new markets, new technology or to generally improve the company performance	No	Yes	No	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes

Table 9 - Involvement of 3rd party expertise in the pre-investment and actual investment phase

7a. How much do investors care about the technology strategy of their portfolio companies?

All the finance investors in the research cases considered the technology and the corresponding technology strategy used and applied at companies in their portfolio as an area of high importance. This is due to the strong correlation between technology and the market value of a portfolio company regarding a potential sale and impact on short and long term earnings. In cases G and H however, lots of other issues were also in the spotlight of the investors in the active investment phase so that technology and technology strategy were not really on the priority radar. The focus was more on stabilising processes and the business model as a whole. In none of the cases had an asset manager or finance investor tried to exert direct influence on the technology or the technology strategy.

This is considered to be the area of expertise and accountability of the company top management and CEO. The finance investors are not and do not want to be experts in this area of activity. This was the opinion of both the finance investors and portfolio company representatives who were interviewed.

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Finance investor pays attention to technology strategy and considers it to be a key indicator of the company market position and value	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Finance investor wants to be involved in the decision making process regarding the technology strategy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Technology strategy is one of the top areas watched by the finance investor in the investment phase	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Finance investor wants to drive the direction of the technology strategy	No	No	No	No	No	No	No	No	No	No	No	No	No	No

Table 10 - Finance investor perspective on portfolio company technology strategy

The job of asset managers is to make sure that all decisions are made based on sufficient information and their target is to achieve the best possible outcome for the investment company. Apart from the financial and segment specific limitations and restrictions applicable to projects and investments in the technology strategy of companies in the portfolios of finance investors, it has become evident that no finance investor is primarily interested in technology strategy or any real long term planning that does not have a financial impact on him. What does count for investors is that the business case and the correlating figures prepared by the company management are robust and substantial. A limiting factor is that specific financial results and parameters have to be in a certain range at the time of sale.

If they are not reached, severe cuts in different areas such as labour, investment, etc. may be the consequence with potential negative impacts on areas such as technology. In some cases this might help a company to survive when, e.g. the top management is obsessed with technology, believing the right technology will solve every problem with the consequence that little attention is given to the finances and parameters other than technology influencing the company situation.

7b. If investors do influence technology strategy, on which basis do they do that (legitimation)?

The data and information accumulated from the case studies shows that the finance investors do not know better than the company management as to which technology or technology strategy is the right one. This is also not their role, but they do have to make the best of any portfolio company. Their overall aim is to achieve maximum return taking into consideration both short-term earnings and sales revenue when the portfolio company is later sold. Actually, in all cases the finance investors stated that they had insufficient expertise to dictate or even suggest the best direction for the technology strategy. It is evident that proposals from the expert committee at the portfolio company are double-checked, but often not directly or solely by the asset managers.

This is the typical area of activity and involvement of third-party companies and back office analysts. They are also unlikely to be experts in the area. But they evaluate and verify the assumptions and framework parameters and check that no parameters have been forgotten. Furthermore, there are cases where experts from outside the portfolio company have expert knowledge that allows them to judge how promising a proposed technology strategy is and what the potential risks are. The difference between investor influenced companies and most owner-led and owned companies is the willingness to take financial risks by taking on new technologies. An independent entrepreneur might follow a specific technology against the opinion and conviction of all other people.

This is not to say that finance investors do not take risks. They do and sometimes it is the investments with the biggest risks that deliver the biggest returns. But when all the analysts and experts are convinced that the direction an entrepreneur would like to take is wrong, no investor group is going to decide to follow him.

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Do finance investors think they or their teams have the expertise or legitimation to drive technology decisions	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Do finance investors verify (w or w/o external support) the alignment of a technology strategy proposed by the portfolio company management with the investor targets	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 11 - Actual finance investor involvement and legitimation to influence their portfolio company's technology strategy

Furthermore, innovations are often not radical, but appear in incremental steps. The small steps do not always guarantee a direct positive financial effect, but they can be vital to get past the next junction on the long-term strategy road and positioning of the company. When investor involvement in the decision making process is too strong, the possibilities of investigating such new ideas pragmatically and without too much analysis beforehand are limited. In case I the investor was even the one pushing forward some investments to update the production technology, but not because he knew more about the technology. The dormant potential for improvement was one of the reasons for the acquisition, known to the market before the investor acquired the business.

Another situation leading to more specific involvement was reported in case E. As the company structure at the time of purchase was not entirely compatible with the requirements of the potential buyers of the portfolio company, investments were concentrated in areas that were interesting for the potential buyers, and other areas were downgraded.

7c. From where do the asset managers receive their information (business analysts...)?

The business analysts in the back offices and the members of the portfolio teams are the most important players in the finance investor's support team.

They are involved and act as advisors in the sense that they analyse and evaluate data provided by the portfolio companies or other sources. Their main work is to follow up developments in the market of the portfolio companies, including the evolution and performance of competitors. Benchmark analysis is often used to work out where companies stand relative to each other. In addition, a major source of advice, specifically regarding products, processes or the technology strategy, is third-party consultants and institutes. At the end of the day, approval for proposals prepared by the portfolio company management has to come from the asset managers in charge of the investment.

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Asset manager has strong support from back office analysts	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	Yes
Asset manager has strong support from a whole portfolio team	Yes	Yes	No	No	Yes	No	No	No	No	Yes	Yes	No	No	Yes
Third-party consultancies are utilised	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Valuable input comes from the asset manager network	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 12 - Asset managers' sources of information

The decision however is not only made on the basis of the facts and data prepared by the company. The input from the finance investor's portfolio teams and analysts plus, if applicable, the feedback from 3rd party consultancies and institutes is very important as well. By intention or by chance the company analysis could miss some important parameters or facts so that the decision of the asset managers could potentially be based on insufficient information. All asset managers are fully aware that they might never have all or even sufficient information required to make the best decision. But by involving further expertise from different parties from inside and outside the investment companies, the risk of making wrong decisions due to absent or misinterpreted data is lower.

8. What is the link / relationship between marketing, organisation, finance strategy influence of an asset manager and technology strategy influence?

The aforementioned feedback from the case studies makes it clear that no finance investor has the intention of dictating the technology strategy of the portfolio companies, mainly but not only, due to their lack of expertise. However, this does not mean that finance investors have no effect on their portfolio companies' technology strategy. There are several links and relationships between technology strategy and other areas that are influenced by the finance investors to the extent that the influence is apparent, just not in a direct way. A mandatory condition for exerting influence is that the finance investor share package is big enough. This was in fact the case apart from A and C. In all cases with dominant finance investors, influence was exerted on budget and investment decisions, even if it was only to give approval, but the consequence was indirect influence on technology strategy.

Similarly, the influence of the finance investor on the market positioning and product portfolio affects the technology strategy of the portfolio companies. In the case of company E, investment in two segments was cut sharply because of a mismatch with the portfolio of all potential buyers for E. New investment proposals were either rejected or delayed. Another pernicious effect reported for E was the finance investor initiative to downsize all relevant departments to a minimum. This does result in an immediate and positive effect to the bottom line result, but the flexibility to react to sudden increases in demand has gone, as has slack for the creativity of the employees. During a difficult business period, most employees do understand the necessity of such cuts in spending and work harder than ever hoping that their efforts will get the company back on track and achieve a better, more comfortable working atmosphere again.

What was reported however was that increased demand and workload just led to an increase in workplaces that are absolutely necessary and mechanically linked to an increased output of products. Administration staff is kept to a

minimum for as long as possible to improve the financial figures. Managers have to fight hard for each additional person to strengthen their teams again. Such situations also severely affect technology strategy. Whether the situation would be different without an external finance investor cannot be said and neither is it the focus of this research project. It is however evident that the asset managers involved in the cases that were studied acted more severely and determinedly with regards to the aforementioned actions than the portfolio company did before the investor joined. Whether such actions are ultimately negative for a company or whether they are vital for survival is another question that cannot be answered by this thesis.

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Dominant finance investor involved	No	Yes	No	Yes										
Technology strategy is influenced by finance investor involvement in finance driven decisions	No	Yes	No	Yes										
Technology strategy is influenced by finance investor involvement in marketing decisions	No	Yes	No	Yes										
Technology strategy is influenced by finance investor involvement in organisation specific decisions	No	Yes	No	Yes										

Table 13 – Areas of finance investor involvement that impact technology strategy

Various CEOs said that for finance investors as anonymous shareholders, it is ethically less difficult to cut workplaces or implement short-notice, market-driven, corrective action in a business than for managers who have been working at a company for years. Whether the actions are absolutely necessary for the survival of the company or whether they are just intended to improve the financial results is not clear and of little significance to the people directly concerned.

9. Which tools can/do investors use to measure/judge whether the technology strategy of a portfolio company will guarantee success in the mid and long-term?

All the institutional shareholders interviewed evaluate the situation and outlook of their portfolio companies on a regular basis. For the cases where a dominant finance investor or finance investor consortium was involved, all the interviewees confirmed a direct influence in the decision-making processes in the corresponding portfolio companies with variations in the area of influence and the extent of influence. This adds the finance investor to the decision-making committee. Each decision normally originates from a business case prepared by the portfolio company management staff and is double-checked and approved by the portfolio company management. This proposal is then presented to the majority shareholder.

What follows is a selection process with three options:

- Green light:

The investor representatives agree to go ahead with the business case as presented, with or without the minor modifications that they request based on their own expertise and know-how. This is often the case for investments in capacity extensions or investments that are below a defined threshold and without significant effect on the product range, market strategy or financial result. One of the top factors is the return on investment in both time and amount.

- Amber light:

The business case is not immediately rejected, but it is not sufficiently convincing for the investor representatives to give a green light to proceed immediately. In such cases further analysis through involvement of the analysts and back office people from the finance investors as well as third-party consultancies and research institutes is requested. With the additional information and expertise input by the enlarged team, the business case might

need to be reworked. The finance investor will re-evaluate the business case in order to decide whether to give the green light to proceed or the red light to stop based on the information prepared by the portfolio company management, supplemented with data and recommendations from the finance investors back offices and the third-party experts.

- Red light:

It sometimes happens that business cases, which are presented to investor representatives, are rejected immediately because of a mismatch with the finance investors' plans. When the positive effect hoped for by the finance investor is questionable or insignificant compared to the investment required, in most cases it will be immediately rejected. Particularly when the sale of a portfolio company is imminent, decisions that do not affect the sale positively are delayed or rejected. Paralysis of this sort was reported to severely harm portfolio companies when it goes on too long. When no adequate feedback for RFQs is given, this leads to frustration both internally at the portfolio companies and very often at the customer base as well.

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Do specific tools exist to evaluate technology / technology strategy of a portfolio company	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Technology / technology strategy is evaluated in the framework of an overall business case (including financial parameters)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 14 - Finance investor evaluation of portfolio company technology / technology strategy

10a. What options can/do investors use to exert influence on their portfolio companies' technology strategy?

Shareholders with small share packages have no possibility at all of influencing the direction technology strategy takes, either directly or indirectly. There are a few prominent examples where finance investors with packages below 10% have tried to put pressure on the portfolio company management to push specific decisions. But there is no known case of a finance investor trying to influence directly the technology strategy through such behaviour. An indirect influence could occur if the portfolio company top management followed the requests from such an investor, but in most cases this does not happen. Majority shareholders however, theoretically have the option and power to drive decisions on technology strategy, but they do not do so. What happened in case F was that the newly installed chief restructuring officer acted with a large degree of freedom. The focus of action for such a person is not technology strategy, but generally speaking the overall organisation. This affects the technology strategy as well, but not as a primary target.

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Percentage of ownership would allow the finance investor to dictate a certain technology strategy	No	Yes	No	Yes	No									
Technology strategy is dictated by finance investor	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Technology strategy is indirectly influenced by finance investor (see question 8)	No	Yes	No	Yes										

Table 15 – Possible ways the finance investors might exert influence on their portfolio companies' technology strategy

10b. What are the mechanisms/dynamics of influence? Do managers hide information – if yes/no – why?

A mechanism that can be and is used by the portfolio company management is to decide which parameters are important and which not. For some there is no grey zone, but for a set of parameters there is usually room for flexible interpretation. It also depends on the sources of information that are used to

gain historical data, current data and assumptions for the future. Presentation of the business case is adapted depending on what the company management wants to “sell” to the finance investors. However, no one would hide important information or use manipulated or wrong data because of the disastrous consequences. It is imperative that mutual trust and respect is established for meaningful cooperation. The only variable is the framework considered relevant for a specific analysis.

When something is considered to be of minor significance or irrelevant, it must not be highlighted. However, transparency is important. If a finance investor or a finance investor consortium suspects that someone at the portfolio company is not telling them the truth or hiding relevant data or information, that person will most likely be replaced without delay. And many interviewees reported this.

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Can (and do) portfolio company managers influence action by “adjusting” the specification of information packages	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 16 – Possibility of influencing actions through filtered information

10c. Are all investors (and asset managers) the same or are there differences between them?

The overall target to get as much money out of an investment as possible is the same for all finance investors. The basic direction and systematic is thus similar for all investments, not only because of the similarity of the target but also due to the fact that employees from investor A can move to investor B and so on. Furthermore, ex-asset managers often found their own investment company based on the knowledge and experience gained from their previous assignments. What always makes a difference is the individual personality of the asset manager, as each one has their own way of making their opinion heard and getting things done. In the case of H, the investor team even spoke

directly to customers and suppliers, which is not usual. An asset manager who is convinced that a portfolio company manager will always act as an agent, but never as a steward will act differently from one who believes in stewardship.

Furthermore, portfolio companies and asset managers often act globally or have their roots in another culture. Categorisation is thus difficult, but there is a minority who are known for being particularly aggressive. These are the people who write malicious letters in which the portfolio company management is strongly attacked (prominent examples are Daniel Löb and Carl Icahn). A majority package is not mandatory for this type of person. In the cases studied for this research, not a single interviewee acted like that or experienced such behaviour, but everyone knows it exists.

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Investor focuses on companies with specific parameters (e.g. "small and medium-sized companies", just out of insolvency...)	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes
Investor also re-organises companies (buy and build, build and burst...)	No	No	No	No	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes
Personality and experience of asset managers impacts their course of action	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 17 - Differences between finance investors, i.e. asset managers

11. Is technology strategy indirectly influenced by e.g. budget decisions?

Involvement of investors in budget and investment decisions at firms they own is clearly one of the most used and most significant ways of being actively involved. This produces dynamics that influence the organisation as well as the technology strategy, which in most cases is directly or indirectly linked to budget decisions. If it isn't the budget or investment for technology strategy that is directly affected, then it is often human resources which are limited and which consequently affect the speed and the direction of evolvement of the technology strategy. The decisive factor for influence in portfolio company management

decisions is the size of the share package. In the cases analysed, all the investors or investor consortiums with dominant share packages exerted influence on budget and investment decisions.

The reported consequence, in the majority of the cases, was a more strict and severe approach than when the company management was able to stand-alone. This is because the focus is different and the willingness to take a risk, which in the worst case may negatively affect the company's result in the short term, without putting the whole company at risk, might be taken by a company manager, but not by the finance investor management team because their focus is more short term.

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Technology strategy is influenced by finance investor involvement in finance-driven decisions	No	Yes	No	Yes										
Technology strategy is influenced by finance investor involvement in marketing decisions	No	Yes	No	Yes										
Technology strategy is influenced by finance investor involvement in organisation specific decisions	No	Yes	No	Yes										

Table 18 - Areas of finance investor involvement that are impact technology strategy

12. Do investors act as consultants regarding technology strategy and organisational learning? If yes, what are the consequences and results?

In the cases under analysis, not a single finance investor directly influenced technology strategy. Asset managers and portfolio teams do not have the expertise or capability to act as consultants for technology strategy. Also, forming a company with the best technology or best ever technology strategy would not be their prime interest. As an area that contributes to the market value of a business, it is not and cannot be completely ignored, but the focus and the key competences of the investor management teams are in other areas. It was frequently commented during the research that one of the main difficulties with technology strategy is prediction of the long-term effect. Some of

the investors had heard many promising things about fantastic technologies that would supposedly bring the portfolio companies to the foreground in their segment, but actually the outcome was seldom like that.

Furthermore, technology is linked with huge investment and in a phase when a company is being trimmed and optimised across all disciplines it is difficult to get approval for investment. The negative effects for the short and mid-term results are often greater than the potential uplift that could realistically be gained from the long-term investment. This does not mean that R&D is always cut rigorously. Just that the focus of the investment is less strategic and more short-term. When investments in projects produce an improved EBITda within a short period or when the company value is increased more than the amount spent, it is definitely an option liked by finance investors. With regards to organisational learning, the picture is different.

The requirements for reporting, KPI creation and follow up are sometimes a good jolt for the portfolio companies. Instead of evolutionary trial and error processes, involvement of an active and experienced investor often leads to the implementation of best practice processes within a short period of time.

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Investors act as consultants for organisational learning	Yes	Yes	No	Yes										
Investors act as consultants for technology strategy	No	No	No	No	No	No	No	No	No	No	No	No	No	No

Table 19 – Do the finance investors act as consultants for organisational learning and/or technology strategy?

13. Are there cultural differences between different investors?

Larger investment funds are active across several continents with asset managers located around the globe, while several of the smaller investment companies have limited their activities to a single region. Cultural and regional

differences were not the focus of the analysis, but it nonetheless became clear that company culture and philosophy were very similar for all the investors involved in the cases. An explanation for this phenomenon is the fluctuation of asset managers, which leads to a mixture of experience and input from different finance investment companies, that coalesces in the individual behaviour and philosophy of each single asset manager. One exception was the dominant investors involved in D, who were more active in the networking process and advice on administrative issues. In the cases under evaluation, no malicious-letter-writer-type of asset manager was found. All business was carried out on a partnership and professional basis with the accompanying decisions and consequences, including investor driven changes in the portfolio company management team. But without verbal aggression or the censure of the portfolio company management.

5.2 Further findings from the interviews and secondary literature

The existing research includes a number of articles and papers that deal with stakeholder activism in general, and influence on technology strategy specifically. The results concerning finance investor involvement have all been derived from publicly available data, such as annual reports. No research to date had used insider information, from either the investment funds or the portfolio company management (Shahzad and David, 2010). Subsequently, the channels and routines of interaction have not been analysed or understood. The underlying reason was not academic researchers' lack of interest. All the interviewees confirmed that the investment company, which was the subject of the interview either as employer or as shareholding party, had a policy not to give detailed information about their interaction with their portfolio companies.

This was also the standard response to the initial formal and impersonal contact with potential interviewees. The main reason for their reluctance is that finance investors do not want to see their names in print, either in an academic article or in the yellow press, as they are aware that this leaves room for interpretation,

rumours and subjective disapproval. All investment fund representatives confirmed that they do not want to disclose in detail: how their companies are structured, how they select their investments or how they interact with their portfolio companies. Consequently, the only option was to confirm comprehensive confidentiality for all information they were prepared to give. Regarding the selection process, the finance investors confirmed they did not focus on companies in specific segments or markets.

A double check of the current investment portfolio of the finance investors involved in the case studies confirmed this. All of them have shares in companies from different market and product segments. A distinction, however, was found with regards to the size of the portfolio companies. This was mainly related to the capital available and not as a consequence of a strategy to invest only in companies that fall into a certain category in terms of size. If the amount of investment required is too much for a single investor, it is common to approach other investors who may want to participate in the investment (even if this is not an ideal scenario, due the increased complexity of all phases of the investment). A business comes onto an investor's radar as a result of research.

Most important for an investment decision is the potential of a company, and not its current financial performance in absolute terms. In different markets and product segments; margins, for example, vary significantly; thus the numbers themselves need to be seen in the context of the business environment and in comparison to other companies with similar business activities. Extensive analysis of the market and the targeted business by calling in external consultancies is standard before an investment is made. Proper analysis at the pre-investment phase is essential for a successful investment. But even if every effort has been made, there is never a guarantee for success. All the finance investors that were willing to talk about their previous investment results (9 out of 14) confirmed that they had sold investments at a loss to off-load shares.

Interestingly, in most cases, the businesses were sold on to other finance investors. The three most frequently named KPIs and measures to rate performance (mentioned by investors for the pre-investment phase, and mentioned even more frequently for the investment phase) are EBITDA (Earnings Before Interest, Tax, Depreciation and Amortisation), OI (Operating Income) and NAV (Net Asset Value). In all cases in which the companies involved were directly or indirectly dependent on the automotive industry, it was confirmed that the automotive crisis in 2008/2009 had a significant negative impact on various KPIs and severe measures had been necessary to compensate for the negative effects. This is just one example of how external events can swamp the effect of stakeholder engagement.

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Investment fund has been involved as shareholder for "... " years at the time of the interview	8	5	10	5	4	2	1	1	2	4	3	1	3	4
Type of investment fund (public fund=>PF, private equity fund=>PEF, hedge fund=>HF)	PF	PE	PF	PE	PE	HF & PE	PE							

Table 20 – Timeframe of the investment fund involvement in the corporation, and the type of investment fund.

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Trend of financial performance (+ = positive, - = negative, ± = stable)	±	-	-	+	+	+	±	-	+	-	+	-	+	+
- EBITDA (Earnings Before Interest, Taxes, Depreciation and Amortisation)	±	-	-	+	+	+	+	-	+	-	+	-	+	+
- OI (Operating Income)	±	-	-	+	+	+	+	-	+	-	+	-	+	+
- NAV (Net Asset Value)	±	±	±	+	+	+	+	-	+	±	+	-	+	+

Table 21 – Trend of financial performance at the time of the interview, relative to the period before the investment fund involvement.

Thus KPIs should be interpreted with caution, especially when big swings are observed, to avoid coming to wrong conclusions. Analysis of the study looked at the correlation of the impact made by an investor on the type of investor, the KPIs (reviewed regularly by the investment fund) and the time frame of the

involvement. No correlation was found with either of the variables, even though the period during which the investor(s) are involved varied from 1 to 10 years. No clear trend in any direction is visible regarding patent filings or R&D spending when the status at the time of the interviews is compared with the pre-investor engagement status. This finding is contrary to previous studies, which found a positive correlation between investor involvement and R&D investment (David et al., 2001).

Both the number of patent filings and R&D spending depend on many factors, including changes in policy and definition. Some companies prefer not to apply for patents, as the application process requires detailed documentation, which can sometimes help competitors to find ways to bypass the patents. If these companies changed their policies and submitted patent applications, the number of patent filings would increase dramatically. A large number of patent applications does not necessarily mean the business is exceptionally innovative or the producer of brilliant ideas. There were no cases in the study where such a policy change regarding patent filings was reported, so the trends observed purely reflect the objective situation, during the time the investment funds were involved versus the pre-investor involvement period.

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Number of patent filings	±	+	+	-	+	-	-	-	+	±	+	-	+	+
R&D spending in % of turnover	+	+	+	-	±	+	-	-	+	-	+	-	+	+

Table 22 – Trend of patent filings and R&D spending in % of revenue, relative to the period before the investment fund involvement.

The reasons for investment fund intervention through acquisition of shares can be divided into three main categories. The most common and typical way for an investment fund to get on board a company is when the business comes onto the finance investor’s radar through the fund’s research team or third-party recommendation. This was applicable in 8 of 14 cases. In 2 cases, the investment fund had been approached by the businesses due to financial

difficulties, while in the remaining 4 cases, the companies had actively contacted investors for an infusion of fresh capital. No correlation was found between the reason for finance investors to acquire shares and the technology strategy.

Any effect on technology is a secondary effect. The main priority is always the improvement and optimisation of financial performance. However, for this ultimate target, it is very important for the investors to fine-tune a business which is running smoothly or to bring a bankrupt business back on track. In all cases, involvement is focussed on the organisational-setting and business practices and looking for low-hanging fruits that deliver results within the short- to medium-term. The strategic long-term vision is mainly developed as a selling argument when the business is going to be sold again.

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
IF identified the business as an attractive target and acquired shares	-	X	X	-	-	X	X	-	X	X	-	-	X	X
Business was in or close to bankruptcy and the IF was approached to acquire shares	-	-	-	-	-	-	-	X	-	-	-	X	-	-
Business was looking for new capital and approached the IF to acquire shares	X	-	-	X	X	-	-	-	-	-	X	-	-	-

Table 23 – Reasons for investment fund intervention through acquisition of shares in the businesses.

Interaction between the finance investors and their portfolio companies can depend on the size of the share package of the respective finance investor or investor consortium. Each investor involved in the cases under analysis in this research project showed interest in the portfolio companies' activities, including the current situation and future plans. This is no surprise, as it is the job of the asset managers to have a good understanding of their portfolio companies. Asset managers need to ensure that the expected and promised return from the investments does materialise and they can evaluate and react only when they are consistently up-to-date. After all, investors have just two options when the

results from the portfolio companies do not satisfying their and the secondary investors expectations.

They can either try to influence the performance actively, as discussed in the chapter on shareholder activism, or they can just simply get rid of the investment. Interviewees with share packages below 10% did try to make comments and recommendations during personal meetings with the portfolio company management, but they were fully aware that their leverage is minimal. Pooling with other minor investors to increase the momentum to influence directly the portfolio company management does happen, but for the investors interviewed this was an option that they very rarely take and had not occurred in any of the cases described in this research. This is due to the fact that on the one hand the opinions of the individual shareholders are often prohibitively different in the detail and then on the other hand there are the difficulties in exerting influence, which have been described.

The situation is very different in the case of majority shareholders or private equity owners of portfolio companies. They can exert direct influence in their role as dominant shareholder or sole owner. At the same time, it is significantly more difficult for them to sell their packages or a company as a whole. The number of potential buyers is much smaller for a business as a whole or a majority stake than it is for a minor share package. In the cases under analysis in which the investors or the investor consortiums had dominant share packages or 100% ownership of the portfolio company, extensive involvement was reported in all cases without exception. If the portfolio company performance meets expectations, the investors are involved, but prefer to stay in a passive, monitoring role.

The more reality drifts away from expectations in terms of financial results and company value, the more the investors will become active. If finance investors are actively involved, that does not mean they jump into the role of the company

CEO. Neither does it mean that their opinions or position are different from that of the company management. But when portfolio companies are underperforming, it can be necessary to act quickly and rigorously. Firing staff and cutting expenditure immediately becomes a priority. For some company managers it is difficult to execute such actions with the required consequence and speed. Reported reasons are empathy with the workers or the attempt to act in small incremental steps, to minimise the negative effect for the employees or company structure.

Portfolio company managers know that there are situations when it is not possible to consider such a plan, but when immediate and decisive action is necessary. This is when the finance investors, as outsiders, are often more objective and aware of the true situation. For the people directly affected, e.g. by layoff programs, this creates a negative after-taste with regards to finance investors. They are sometimes only thought of as the people who fire employees just to improve the company result and line their own and their company's pockets. However, there are cases where companies would have gone bankrupt had the finance investors not taken strong action. Although an interesting area, it was not the aim of this thesis to investigate which strategies are vital for portfolio company survival and which are simply an exercise in getting a good deal for the finance investors involved.

5.3 Answers to the research questions:

1. Do finance investors aim to influence directly the technology strategy of their portfolio companies?

➔ None of the finance investor representatives interviewed in this research project aimed to influence directly the technology strategy of their portfolio companies. Even if the technology used and applied by a portfolio company is considered by the investors to be highly important for the company value and market position (Hall and Oriani, 2006), it is not their primary focus. It is simply considered to be one element that is crucial for the company's success, but one

for which expertise has to be brought in by the portfolio company. However, the evidence from the case studies for this project confirms that if a finance investor has a dominant share package, they indirectly exert influence. This happens through involvement in decisions about budget, investment, workforce, market or product portfolio that are made on the basis of detailed fact and figure analysis.

All the business cases presented by the portfolio company management will have been carefully checked to ensure they are achievable, realistic and supportive of the majority investors' primary targets. At this stage the finance investor portfolio teams and 3rd party companies are involved too, to ensure all the relevant parameters and conditions have been given adequate consideration. Like balance sheets, business cases can be designed with a different focus that culminates in a subjectively influenced "best way to go" result. Finance investors often recommend specific consultancies and institutes, but the bill normally has to be settled by the portfolio company, no matter what the outcome of the involvement. The finance investors' primary target is not to build a technology leader, but to achieve the best financial performance from the companies they have acquired.

It does not mean that they intentionally block all technology pushes, but they consider themselves to be in charge of evaluating whether the portfolio company has the capability and whether it can produce the best possible return. As no investor representative is capable of judging straight away whether a technology strategy is good or bad, each business case is always double-checked. This is not always, but frequently with the involvement of specialists in analysis and sometimes even with experts in the specific technology itself. It is vital for the finance investors to have the clarity to decide which is the best option for them to support.

2. How do finance investors and their portfolio companies communicate (methods, tools, people involved...)?

→ In all the cases, phone, email and personal meetings were confirmed as being regularly used to exchange information between investor and investee. The most important standardised exchange tool is a report, which in most cases is prepared on a monthly basis. For the minority shareholders (case A and C) the portfolio company defines the content of the reports, whereas in all other cases besides I the content was strongly influenced by the dominant shareholders. The investor then acts as a coach by questioning the portfolio company's figures and statements, but also as a boss, i.e. by requesting the achievement of a certain EBIT target. From the finance investor side, the asset managers in charge of the investment lead the exchanges, but members of a defined steering committee or other back office staff join in when required.

From the portfolio company side, the CEO leads the exchange, typically supported by other C-level members and people from lower levels when their involvement is needed for specific topics. Thorough preparation of all the business cases requiring finance investor approval is also critical. When information or data is missing or when questions from the finance investor cannot be answered precisely or in line with their intended course of action, the probability that a business case proposal is rejected is high and the rework afterwards often painful for all people involved. This produces a very disciplined way of working and in many cases more critical internal evaluation before a scenario is presented to the shareholder.

This also leads to situations that are described in the case E, where investment approvals were not given or reworks were requested while the proposal was still in the internal approval loop. Not because the people in charge were convinced this was required, but because they were afraid of negative comments from the shareholder and rejection of the proposal.

3. *What is the frequency of exchange between finance investors and their portfolio companies?*

→ Depending on the individual situation of each portfolio company, the frequency of exchange can be lower or higher, but when a dominant investor is involved, it is normal for emails and phone calls to be exchanged several times per month. All the interviewees confirmed this. In difficult periods with bad financial results or, e.g. in the budget period, the frequency of contact is higher and several personal meetings are scheduled in a month, while in a normal environment monthly or bi-monthly meetings are standard. The closest exchange happened in case F, where a chief restructuring officer was installed at the company. It may be summarised that finance investors always want to be up-to-date regarding the activities and current status of the companies in their portfolio.

4. *Do finance investors have the expertise to define the right technology strategies for their portfolio companies?*

→ The finance investors interviewed confirmed that when it comes to technology and technology strategy most of them very quickly reach their limits in expertise and experience. Each investment is far too individual to draw standardised conclusions regarding technology strategy. It is a very rare occurrence for an asset manager to have responsibility for two investments with overlapping similarity at the same time. The driver for technology strategy is clearly the expert and the top management team of the portfolio company. They might seek support and additional expertise from 3rd party companies, either on their own initiative or at the request of a dominant finance investor, but a finance investor does not and cannot define the technology strategy, but at the same time does need to evaluate scenarios and business cases on a professional basis, questioning the input and formulating the right questions.

5. Who from the two parties (investment company and portfolio company management) considers whom to be the expert on technology strategy?

→ All the interviewees, regardless of party, confirmed that the expert panel for technology strategy and all technology related decisions is the portfolio company management supported by the experts in their teams. Regarding the asset managers and the finance investors portfolio teams, it is clear that they have extensive experience and knowledge in analysis, markets and sometimes products as well, but when it comes to technology or technology strategy they lack know-how and experience in comparison to the portfolio company management team. If this is not the case, then the portfolio company management would not be sufficiently competent for its role. Very clearly, ultimate accountability lies exclusively with the portfolio companies.

Each involvement and intervention by the finance investors is an attempt to improve short/mid-term financial company performance and company value overall. This might affect the technology strategy, as explained before, but not because the investors have superior knowledge of the technology. The simple reasons are financial performance and company value.

6. What is the finance investor's role in the organisational learning process of their portfolio companies?

→ There is clear evidence that finance investors influence the organisational learning processes in a variety of different ways. One way is by involvement in the process of budget and investment approvals. This clearly affects the prioritisation of the portfolio companies. In some cases investors reject budgets or investment requests that have already been approved by all the other stakeholders involved. That means the investors indirectly steer the organisation in a direction in which it would not be moving without investor control and regulation. Examples are production capacity extensions that are

not made, R&D projects that were not or not fully approved with the necessary investment, increase of workforce in different areas, etc.

All these are finance driven activities that affect the company as a whole, in some cases more significantly and strongly in the long term than in the short term. At the same time, this does lead to improvements in the preparation of budgets and investment requests, as it is evident that a well-prepared and well-founded proposal will be easier to approve than one that is less tight and with which the investors have issues. Another significant influence on the organisational learning process comes from the reporting system and instructions on how business cases have to be presented. All the majority shareholders interviewed for these case studies required the submission of specific reports. It starts with a request for budget versus actual comparisons at a level of detail far beyond common practice before the investor was on board.

Prominent examples, besides the standards such as turnover by customer and region; are price erosion, project budgets, margin evolution, past dues, and all that by customer, by region, by plant and so on. This results in changes in processes and management. In the preparation of business cases, the aim is broadened to avoid missing any parameters required by the investors. The conjectures to be taken into consideration are often defined with involvement of 3rd party consultancies and research institutes. The back offices and portfolio teams of the finance investors also contribute to this. The feedback from portfolio company management on such involvement is positive, as it leads to more objective, realistic and reliable business cases and measurement of the company performance.

For people who like to play active and enthusiastic roles in their businesses, which can mean a limitation as finance investors in general do not value passion or creativeness, because their target and timeframe for involvement is different from that of the classic entrepreneur.

Chapter 6 Discussion

Today, most companies apply a variety of technologies in their processes or products (Elyasiani and Jia, 2011), as do the companies in this study. It is vital to follow a technology strategy that takes into consideration long-term constraints and company targets to ensure long-term fitness and survival in the market (Klepper, 1996, Burgelman et al., 2008). A good market position can be lost in a relatively short time if the wrong technology is chosen (Pegels and Thirumurthy, 1996, Zahra et al., 1995). The evidence from the case studies confirms that finance investors act in consideration of these beliefs and facts when budget and investment decisions are to be made. All the interviewees confirmed that technology and technology strategy are very important due to the direct impact they have on the company value at all times.

A positive evolution in short and medium-term earnings is reported by shareholders in many cases to be another factor why R&D investments are given approval. These findings prove that finance investors are not per se short-term result oriented and reluctant to approve long-term R&D investments, as concluded by other studies (Graves, 1988, Graves and Waddock, 1990, Hoskisson et al., 2002). Neither do they strictly confirm the assumption that finance investors are more in favour of R&D investments with long-term effects than corporate management (Baysinger et al., 1991, Davis and Thompson, 1994, Hansen and Hill, 1991). All interviewees, without exception, made the comment that it makes sense to support long-term investments in technology when this has a short- or mid-term impact on the business, due to, e.g. value creation in the form of products or patents, or when it boosts the price a buyer would be willing to pay.

The pre-condition is a solid business case that delivers more in earnings than the total cost. When the corporate management prepares and presents this information carefully, there is no reason to be against. This professional and firm goal-oriented cooperative approach was also reported by Chizema

(Chizema, 2011). Evidence exists for the positive effect of direct involvement of finance investors in the technology strategy of start-up companies (Nisar, 2005). This is a logical benefit as the founders of start-ups are often inexperienced in the business world and struggle to respond professionally to market needs and requirements. For mature businesses, from which these case studies were built, the feedback was different.

In no research case was a direct influence on the corporate technology strategy found. These findings are in line with the results from other research projects (David et al., 2001, Baysinger et al., 1991). The role that finance investors assume for the mature companies in their portfolio is pretty much focussed on organisational learning and control at the management level. In only one of the 14 cases – case H – was the investor involved in discussions with suppliers and customers; on the one hand to leverage personal relationships, but also to understand the market needs and rules as well as possible. Close involvement, but still limited to organisation, was also found in case F where a chief restructuring officer had been installed.

These are two rare, but very good examples illustrating that the typical investor is not involved in the day-to-day business and that a much more intense engagement, similar to the involvement in start up companies is an option if needed or beneficial for the investment. The age of the study companies is recorded in table 2, but no correlation was found between the individual corporation's age and the research project results. Thus it can be concluded that the age of the sample companies does not pre-determine any specific characteristics. It is important to note for the observation concerning this dimension the fact that the age of the companies varied from 14 to over 400 years. The average age was 93 years, which means all companies had already passed the initial stages of *forming, storming, norming and performing*.

David, Hitt and Gimeno's analysis concluded that finance investor activism does lead to an increase in the R&D spending of their portfolio companies, but not in a direct or prescribed way (David et al., 2001). In contrast to the findings of David, Hitt and Gimeno, the case studies did not show a clear correlation between the investor involvement and the R&D spending of the firms (see table 22). The results of the case studies confirm, however, that finance investors who invest in mature businesses do not see themselves as experts in technology strategy, and do not steer the companies in this regard. They do not focus on that area, but do want to be informed and involved, to be sure that decisions are made on the basis of the best and latest available knowledge (see tables 10 and 11).

This level of involvement minimises the risk of the corporate management suggesting a direction that supports their own interests better than the ones of the shareholders, a risk that agency theorists see in all such relationships (Jensen, 1994, Baysinger et al., 1991). No such agency conflict was reported by any of the interviewees. In all cases, the investors commented that cooperation with the firms is collaborative and target-oriented. Feedback from corporate management teams is two-sided. While the majority of the interviewees on the investee side appreciate the support and positive influence of the investor, some criticise the stringent control and involvement in decision-making processes. In how far these are purely objective observations, or whether some senior managers simply dislike being overruled by sometimes very young investor representatives, cannot be ascertained by this study.

The analysis of the case studies carried out for this research project investigated the extent to which real and actual interaction and influence takes place in the area of technology strategy by finance investors. Evidence from the case studies confirms that finance investors do influence the technology strategy of a portfolio company, but not directly. Any influence originates from the coaching, consultation and control role of the finance investors, which impacts different areas and disciplines according to the KPIs defined. A

mandatory condition for investor influence is the momentum of a dominant share package (Grossman, 1999). Luckily not every stakeholder or minor shareholder can exert direct influence on a company in which they have only a few shares.

This power is given only to the investors who have share packages that are big enough to allow such involvement by law (Le et al., 2006). Minority shareholders thus do not play a major role in company decision-making processes as they do not take part in proxy voting. The cases where minority shareholders do make proposals or combine their voting rights with other shareholders are rare (Grossman, 1999, Daly, 2011). Isolated exceptions are prominent individuals like Carl Icahn who act very aggressively with the intention of attracting public interest. Otherwise portfolio company managers tend to be reluctant to accept ideas, proposals or even requests from minority shareholders, simply because of their lack of leverage (Kaplan and Stroemberg, 2003).

This was observed in cases A and C, which fall into the category of no dominant investor involvement. The channels through which indirect influence is made are management accounting and steering. An area that positively impacts the decision-making processes is the reporting system. Majority investors usually make a request for additional KPIs to be included and a lot of plan/actual comparisons. Beyond this, data has to be prepared not only as grand totals of a corporation, but by customer, by region, by plant and so on. The additional layers of information that have to be prepared, usually on a monthly basis, bring more clarity to the actual company situation and help to identify quickly when things are drifting in the wrong direction. This is also done to identify deviations from budget or trends that are not immediately visible.

This is standard protocol when investment funds optimise a business that is running stably. The situation is different when shares are acquired in firms that

are bankrupt or close to bankruptcy. In such cases, the number one priority is to rehabilitate the business including the processes as a whole, so that it can survive and remain in the market. Two cases where such a situation was found are the cases G and H. A lighter form of stabilisation and re-framing can be found when the overall business is running well, but specific product lines or markets are down. This was observed in case E, when the investor decided to exclude a product line from the strategic and operative focus. The main reason for this decision was the poor fit in the portfolio of potential buyers for company E.

In all decision-making, it is very important to understand not only the factors bringing about improvement, but also those causing deterioration in the performance of a business. All interviewees confirmed this to be the key to drawing the right conclusions and launching the right actions. When a global business is over-delivering, e.g. the EBIT, it does not mean that all regions and all products are following this trend. Very often a boom in one region can over-compensate a negative trend in another region, with a neutral or even positive grand total result. It is vital to understand the situation at a more detailed level to take the right action at the right time. Furnished with this input finance investors are able to draw conclusions and take action.

Interestingly, the company management itself may also become active based on this additional data. Due to their extensive experience in data analysis, finance investors do have excellent knowledge in that area and do immediately implement best practices, whereas a portfolio company is likely to have been changing incrementally and improving things by a heuristic trial and error approach or by falling back on tried and tested paths (Durmusoglu et al., 2008). A very important aspect of action taken as a result of data- and situation-analysis is the time horizon considered relevant for the decision-making. Any positive long-term effect that has no benefit in the short- or medium-term for the business will not trigger financial investment when the long-term vision cannot be sold at a high price to potential buyers.

Owner-led corporations very often accept investments that will only deliver results for the next generation of owners of a business. Similarly to reporting, the preparation of business cases is influenced, but not especially strongly. The decisive factor here is more the leading role that majority investors take in the approval process for investments and budgets in their portfolio companies. All investors with share packages big enough to enable them to exert influence confirmed this practice (see table 18). The outlook of a finance investor will typically be more critical than that of one of the portfolio company members. This was also concluded by Choi, Park and Hong (Choi et al., 2012). The investor time-horizon is different to that of the portfolio company manager and the finance KPIs in particular are crucial for a potential sale of a business.

In the portfolio companies, this more restrictive process results in severe internal rules as well. A manager of company E said, “In the past it was always possible to kick off investments when a salesman confirmed they had agreed on a deal with a customer based on an offer made, but without a signed nomination. Neither the finance team nor the plant management blocked such activities. Since the investor has been on board all the people involved object to starting without having a customer signed document available to ensure they do not get into trouble when the investment request reaches the investor for approval.” This is an example that illustrates how additional controlling and monitoring influences the behaviour of an entire organisation.

Without changing any rules, just by strictly following the existing ones. While this loss of pragmatism appears painful for some, it also reminds people to reconsider the rules and process definitions. Maybe there are cases where a more pragmatic approach is right and justified, but in such cases it may also be better to adjust the rules and processes instead of acting against them systematically. In a complex strategic architecture, all elements have to fulfil a function, otherwise they are obsolete. It requires a certain experience and expertise to understand what is needed and what is obsolete. When this is

missing or not adequately developed at the corporate management level active shareholders can fill that gap (O'Shannassy and Hunter, 2009).

Taking into consideration the huge number of companies in the ownership of finance investors it can be said that active investors play an important role for the economy through their involvement in the area of corporate change and learning. Evidence for this was found in all cases besides case C, in which no majority investor was involved (see table 19). This confirms that companies in the ownership of active investors are forced to carry out changes that are often tested best practices from other investments. Avoiding incremental trial and error modifications in the reporting and the stringent application of defined processes is for many companies a significant step forward. Active investors are not inventive entrepreneurs who come up with radically new ideas for products and processes.

Otherwise, they would set-up one new company after another instead of getting aboard existing and sometimes very mature companies. They are more entrepreneurial tuners who have the experience and knowledge of how to optimise systems so that the best and the most can come out of them. The job of finance investors can be compared to that of a vintage car dealer. They need to identify investment opportunities with a good, solid basis, but also the potential to gain in value when fine-tuned. There are also cases where a complete rebuild is not entirely necessary, but can still be justified if the market value afterwards is higher than the total investment needed. And last, but not least, there can be unexpected casualties.

Something that at first sight seemed to be running well turns out to be disastrous when minimising the loss becomes the new target. And similarly to the finance investors, vintage car dealers are normally open to all good deals, no matter what brand or type of vehicle and this is equivalent to products or branches of business. Looking back to the groundwork of this thesis, the

evolutionary theory, the findings are clear evidence that institutional shareholders act in support of the evolutionary theory. They contribute positively to the corporate learning and organisational development processes in the businesses they own to gain the maximum return in the short and long-term. With regards to previous evidence on investor involvement, it can be said that an anonymous, pure fact and figure analysis may potentially reach the wrong conclusion.

The conclusion arrived at in the past that investor involvement is positively associated with R&D spending has not been confirmed. A change in some KPIs that occurs in parallel to the involvement of an active majority shareholder does not necessarily mean a strong direct impact on the area that is measured by the KPI. To discover the real trigger chain, it is vital to look at each case in detail. There may be cases where direct influence is exerted, but most probably, as proven by the outcome of this thesis, there is a lot of indirect influence that triggers various actions, adjustments and changes. Secondary analysis of data from the nowadays incredibly large databases is highly valuable. This shall not be questioned. In order to draw the right conclusions it can however be necessary to look behind the curtain in order to understand the mechanisms, roles and reaction chains.

Chapter 7 Conclusions and further research

The evidence gained from the case study research proves that finance investors with dominant share packages, or even sole ownership of companies, interact closely with corporate management. Both the channels and the intensity of interaction were analysed in detail leading to the following outcomes. Finance investors act as monitors, but exert direct influence as well. By doing so, they participate in shaping the organisational landscape and influence the evolutionary processes by implementing tested practices, standards and rules in administrative areas. These findings illustrate pretty well the role that investors play in the companies in their portfolio and, in consideration of the high number of investor engagements worldwide, their impact on the global industry and economy.

The legal authority that any shareholder gains when they acquire or hold a certain percentage of the total shares of a business is clearly the justification for the acquisition. The justification in itself is insufficient without the necessary capability and expertise, but nonetheless a mandatory factor in impacting organisational behaviour and processes. Minority shareholders might want to have close interaction with and involvement in their portfolio companies as well, but company management normally is not very open to such external advice as long as the investor has no authority for hiring and firing. Such investors might be listened to and depending on how they are regarded by the portfolio company management, their input may play a role in the decision making process, but if it does, then only because the company management wants it to and not because this is the investor's wish.

Such first-hand insights, collected within the framework of the study were absent in previous research. Drawing conclusions from figures and secondary data, without detailed knowledge and understanding of the interactions behind the scenes, can lead to misinterpretations and incorrect pseudo-objective

observations. Technology strategy, was and is, for all the finance investors interviewed an important area due to its effect on the company value and earnings, but not something that they were attempting to steer directly. Responsibility for this sensitive area has to be clearly and solely assumed by the company management. Direct and active involvement of investor representatives as indicated in previous research was not found. All the interviewees confirmed this, regardless of whether they were from the investor or the company side.

The expert committee for technology strategy is the corporate management team and it is part of their role to work out strategies and plans that have to be presented to and sanctioned by the majority investors. The shareholders do though indirectly influence the directions of portfolio companies, when they have enough shares to be involved in the decision-making and the organisational learning processes, as explained in previous sections. Whether the indirect effect they have on the technology strategy of each individual portfolio company is positive or negative cannot be answered by this research project as no corresponding data that would allow such analysis on a scientifically solid basis was collected. Previous evidence that investor involvement leads to an increase in R&D spending has not been confirmed by the case studies.

An effect is not the consequence of the portfolio company following the direction dictated by a finance investor, but the overall result of indirect influence in combination with many other factors that have a role in a company's technology strategy such as government policies or activist campaigning. The cases confirm that the involvement of active investors in companies can and does produce quicker learning cycles, but also radical and rapid changes when, for instance, tested best practice procedures and methods are implemented. The initiation is typically, either a direct demand coming from an active investor or through initiation of activities such as acquisition of third-party expertise that was not used before. In the current global business environment such evolution boosters are decisive for the survival and success of individual companies.

Small and medium size businesses do not generally take such an approach on their own initiative as they are often too focussed on day-to-day activities to consider the larger, extended market and economic changes. Furthermore the information gained from the research project uncovers a lot of internal company roadblocks that vary in occurrence and characteristic from case to case and over time. Making a few company policy adjustments could easily dismantle most of the moral roadblocks identified in the fieldwork. This could happen by implementing regular communication with the employees, in which the role and involvement of the finance investor(s) is clearly explained within the conditions set down by law.

In particular the positive aspects of investor involvement should be outlined, in several of the cases that were analysed this would have changed the picture from a pure cost-oriented investor for whom employees are nothing but a cost factor to a performance-oriented one who still wants to make the best out of the investment, often with positive, long-term consequences for businesses. Such transparency would help disenchanted employees who are not fully behind company policy because of poor internal communication or a lack of information to allay their doubts and negative thoughts (Hall et al., 2014). Such openness can eliminate rumours among employees about hidden agendas and their potentially negative impact on the workforce.

First line management made no mention of mistrust and lack of information, but the organisational layers below confirmed they were a major cause for deteriorating commitment and dedication at the working level. Trust is a vital element to keep the workforce on all levels motivated and committed to contributing to the success of the corporation. This kind of open circle communication across all management layers, with the right focus and right level of detail appears to be key to managerial practice in maintaining and boosting the motivation and involvement of the workforce in changing environments. Replacing insecurity and guesswork by clear information, a transparent outlook and visions is something that employees should be able to

expect from a dynamic, modern leadership team even in consideration of the changes and challenges of interacting environments.

This goes back to the very basic needs of people, such as the need for self-fulfilment. Sharing information is a demonstration of respect for everyone and is confirmation that each person has a role to play. Employees can and want to follow and believe in such leaders. A measure promoting a lot of trust would be the involvement in the investor meetings of a few people selected from all the layers of an organisation. While at first sight this might not be seen as a very beneficial use of the investors' time, it can be the key to unlocking the potential of an organisation that has become frozen when the company's direction is unclear to the workforce. In feedback sessions with some of the interview candidates some successful tests were confirmed.

The thesis results also lead to the conclusion that regulations do play a significant role in defining a corporation's technology strategy, the regulations on emissions, for example, and this outcome should be a useful take-away for public policies. Taking a closer look at individual industries would enable the specific requirements of those industries to be defined and in return these would allow specific and individual improvements not only benefiting the environment and all stakeholders, but also the corporations themselves. Another question beyond the focus of this work is how much public policy involvement in corporations is right or good. However, public policy is clearly a channel which can be used to influence and steer corporate decision-making in line with targets that are defined by not only looking at individuals' interests, but by also focussing on environmental effects and the public in general (Hoskisson et al., 2004).

Taken as a whole this research project provides evidence that investor involvement is increasing and contributing to the pool of information, experience and expertise that is used in corporate decision-making processes. Several

companies would simply have been eliminated without the involvement of finance investors, not only because of the fresh input of capital, but also because of their involvement in organisational development processes and decision making. A lot of gut decisions are being replaced by fact and figure-based decisions, often using models constructed by third-party consultants or the finance investor portfolio teams. By setting internal rules and regulations accordingly more objective decision making processes can easily be implemented.

While the gut decisions of experienced people are often as good as or even better than pure data based decisions, the big difference is the reproducibility of decisions and the non-dependency on specific people. In summary: investor involvement pushes companies to implement processes that are not centred on individuals, but part of a comprehensive model that allows experienced leaders to take over control within a short period of time. When the principles are communicated openly and the framework of the model including the data relevant for the decision making process is shared with the internal stakeholders such as investors, the management and the workforce, broad acceptance will be the consequence, including agreement to informed decision making.

This sounds very simple and easy to implement, but as often is the case in life, it is the small steps and simple things that make the difference between a successful strategy decision and one that fails. And each fact shared removes a potential negative assumption or rumour from minds and builds trust. This work opens up the potential for the next layer of transparency for investment fund managers and corporate CEOs and should not only trigger a change in mindsets that results in a more open communication both internally and externally for the benefit of companies in the portfolio of the investor. It should also create awareness of the indirect influence the investors' involvement has on the corporate technology strategy definition and other areas as well.

The key to investor involvement, which is of utmost importance for all stakeholders, is that the finance investor representatives must clearly communicate their intentions regarding any specific action or requirement and the consequences they expect. Corporate management teams have to analyse the consequences and effects from their own perspective, based on the knowledge they have about mechanisms and processes in the business. Any side-effects such as deceleration in the decision-making processes or influence on the direction of the technology strategy due to investor-desired adjustments to the delegation of authority have to be identified and communicated if a regulatory circle is to be triggered.

Whether investors are willing to react by adjusting their actions and requirements will depend on the individual situation and specific agenda. However, the option to react only exists when the feedback function in the regulatory circle is working. This is in the responsibility of the corporate leadership team and requires awareness and a good understanding across all levels and disciplines within a business. The fundamental requirement is that an open and constructive exchange between investor and investee is possible, even if perceived by the investor side as criticism or an attempt by corporate management to avoid specific requests. When these basic prerequisites are not given, cooperation when the investor has hold of the steering wheel will remain in a control loop and potentially unwanted effects may be uncovered when it is too late to react.

This finding also reinforces the previous recommendation to seek an exchange with the employees in a business to get their buy-in on specific actions, right down to the level of feedback about consequences and effects. The proposed actions may match exactly with what is wanted, but most probably there will be divergences that were not previously visible on the radar. When this is the case, the internal regulatory circle helps to maximise the output of each individual employee by not only being in the role of their specific job, but additionally by helping as a consultant in a very specific area. This micro-consultancy, which

already exists in different but similar forms, such as the continuous improvement process programs, is an excellent way to improve employee identification with their employing company.

The outcome of this project would benefit from further and broader evidence. A research project based on a quantitative analysis of the results of a structured questionnaire would be a suitable augmentation and the theoretical framework and findings developed in this thesis could serve as a platform. Further quantitative analysis is expected to strengthen the evidence and information gained from the 14 case studies summarised in the previous chapters. The use of an online-questionnaire seems to be the most appropriate method to collect information for such a project as it means a maximum of addressees can be reached with minimal effort (Gill and Johnson, 2002). The addressees could be selected according to a range of parameters such as company size, industrial sector, etc. and feedback in the form of emails would mean this information can be tracked and a substantial quantity of data would be available for analysis.

In contrast to the underlying purely qualitative work, the results of a quantitative study would be more focused and could possibly identify some outliers as well. The major and unavoidable roadblock is the lack of response to the questionnaires in the first place. Experience from this project and also several other research projects involving questionnaires is that reminders and personal calls can deliver additional results. However, this may be an issue as this is very time consuming and still does not get the return rates above 50%. Personal interviews are even more difficult to arrange when the target people are not personally known to the interviewer and contact through third-party friends or colleagues is not possible.

Finding interviewees was the biggest hurdle for this project and was only accomplished by being persistent in calling people when there was no response to emails and no insider contacts had been befriended (e.g. the CEO secretary)

in the target organisations. Contacts, no matter how elusive, helped a lot to establish a connection with the targeted interviewees. Further interesting cases for individual and specific study could be defined when a quantitative analysis delivers outliers. Again qualitative analysis should be considered for such cases to understand in depth the situation and the drivers for the different effects. Additionally, a qualitative in depth study of a complete organisation with interviews at all levels of the hierarchy over a certain period of time could bring further interesting results.

In this thesis the interviews were at the top management level. However, it can be assumed that the involvement of active investors also has an influence on the middle and lower management behind the scenes, which is not directly visible and obvious for the first line managers. In how far such influence plays a role in the performance of a business cannot be said at this point. But it is definitely worth digging deeper to develop a comprehensive understanding about actions and reactions to investor activism within a firm.

Appendices

Appendix 1 - Interview questionnaire



Interview questionnaire (semi-structured)

Information about the research project:

The research will be focused on the influence of investors on decision making and learning processes in their portfolio companies, with the main emphasis on technology strategy.

Confidentiality guarantee:

All information from the interviews will be handled strictly confidentially and appear in the doctoral thesis only with codification of people and company names.

Questions:

0. General data: (a) Industry - firm, name, position, how long with firm, (b) investor firm, name, role, age + experience
1. How often do investor and investee communicate?
2. Who (position/responsibility) communicates with whom?
3. Which communication methods are used (e.g. email, phone, personal meeting, ...)?
4. Are reports made regularly? If yes, what is the rough content of the report (key figures, projects...) and who prepares/receives it?
5. Do your asset managers specialise in specific sectors, markets and/or products? If yes, what is the reason/justification (experience, expertise, individual interest,...)?
6. When do investors involve or request 3rd party know-how and/or advice? Who is/can be the 3rd party (specific division of investor, independent consulting company...)?

- 7a. How much do investors care about the technology strategy of their portfolio companies?
- 7b. If they influence the technology strategy, on which basis do they do that (legitimation)?
- 7c. From where do the asset managers receive their information (business analyst?, ...)
8. What is the link / relationship between marketing, organisation, finance strategy influence of an asset manager and technology strategy influence?
9. Which tools can/do investors use to measure/judge whether the technology strategy of a portfolio company will guarantee success in the mid to long-term?
- 10a. What opportunities do investors have to exert influence on their portfolio companies' technology strategy?
- 10b. What are the mechanisms/dynamics of influence? Do managers hide information – if yes/no – why?
- 10c. Are all investors (and asset managers) the same or are there differences between them?
11. Is the technology strategy indirectly influenced by e.g. budget decisions?
12. Do investors act as consultants concerning technology strategy and organisational learning? If yes, what are the consequences and results?
13. Are there cultural differences between different investors?
14. Can you recommend other people whom I could interview?

The case of company “A”

Data collection

The data used for analysis of the investor – portfolio company relationship in the case of the company “A” was collated from the study of existing secondary data, such as annual reports, the company website, press releases, the company internal magazine, which is published monthly and one personal interview with a board member of the portfolio company. From the investor side, one asset manager who was involved in the 2010 investment was interviewed.

Company background information

Today the company “A” is one of the market leaders in Europe for Broker Software. It was founded in 1985 as a small software company offering software for construction financing. At around the same time the founder tried to pool separate independent insurance and finance brokers. By 1986 the definition of the area of activity had changed from construction financing to general brokerage consulting. “A” was one of the first companies in that area to offer computer analysis enabling consultants to simulate quickly different scenarios. In 1992, the first software to include online access and connection functionalities was developed and successfully launched on the market. Having started in 1985 with a handful of associated brokers, the number had grown to 500 by 1993. And the growth story continued.

Today more than 10,000 brokers with an agency funding of roughly 5 billion Euros use the software packages offered by company “A”. The permanent increase in customers is strongly linked to the company’s innovativeness and customer orientation. Every one to two years a new software tool or specific application is launched on the market. These tools were developed purely in-house during the first few years after the foundation of “A”. In 1991, a strategic partnership with another software company was started. Acquisition of 1/3 of the

shares of this company proved to be crucial to the success and profitability of the cooperation. As a consequence of the cooperation, which included the first brokerage system in Europe with online connection to all leading European investment companies, the remaining 2/3 of the shares of the partner company were acquired in 1998. In 1999 both companies, previously private limited companies, were merged into a public traded company.

After the merger of the two companies, the registered capital steadily increased in the following years from less than 2 million EUR to more than 5 million EUR. After the merger, when the company was publicly listed and traded, the first non-family investors to acquire shares were customers. Subsequently, in the following years the dominant milestones for “A” were the foundation of a stock broking bank for financial service providers in 2006 and the acquisition of another financial service provider with 300 associated brokers and a corresponding agency fund of 1.5 billion Euros. In 2009, around one third of the company shares were sold from the founder family to 4 insurance companies, each of them owning less than 10% of the shares. The expected turnover for the year 2010 was around 70 million EUR, achieved with 92 full time employees.

The role of technology in company “A”

The company “A” division that develops and deals with pure finance products is not at all directly affected by technological changes. However, in the area of software and IT service, it is key to keep pace with the competitors and offer solutions based on the latest available communication and computer hardware technology. The speed with which transactions can be made, security and user friendliness are decisive factors when a broker is selecting their software tools. Mega trends in “A”'s line of business were first the integration of online access to internal databases, later direct connection to trading platforms and today accessibility and usability at any place on earth. Such mega trends first have to be identified and then “A”'s business adapted accordingly. It goes without saying that all hardware and software always has to be up to date and

complaint with the latest available technology and functionality. Otherwise clients simply move to another company that does provide state of the art or even advanced technology.

To maintain a strong position like “A” has today, regular investment in the infrastructure and screening of future trends is vital. The overall business model of “A” would be in danger if it lost ground in the area of brokerage software. One of the projects currently under investigation is an animated trailer tool. Depending on the client’s need, the broker can build a specific and fully customised animated movie with just a few clicks. Even if this is not a radical innovation, but just the next step in an incremental adaptation process, “A” will once again be the first to launch such a tool. The steady improvement and adjustment required to be ahead in the state of the art technology is mandatory for “A” to maintain the base of brokers and to increase further their business. Once a broker decides to move away and use another system it is extremely difficult to get them back, as this means a huge investment in both financial terms and manpower.

Ownership structure

From 1985 until 1999, “A” was 100 percent privately owned by the founder and his family. In 1999, when “A” went public, people outside the founder’s family acquired a small number of shares. The majority of the investors who had joined in an early phase were customers of “A”. Today the family of the founder still owns around 55% of the shares. Other major shareholders are 4 institutional investors with packages of 9.99%. The portion of free-floating shares is only around 5%. Shares owned by customers are also included in the 5% free-floating shares, which means no dominant influence is possible by law.

Interaction with investors

When “A” went public, some of the investors tried to discuss in general terms how the company was going to be managed in one-to-one meetings with board

members. They wanted to exert direct influence on the day-to-day business and long-term strategic decisions. In fact, the board members were not particularly interested in such investor action and just considered it to be the opinions of minor shareholders. No one felt under pressure and decisions were not changed. No one tried explicitly to exert influence on the technology strategy. Obviously the customers (who are in the role of finance investors) seek openings to generate advantages for themselves as customers of "A". This may be by adjusting the price guidelines, selection of suppliers or other business related issues. The company needs to invest in new software and hardware technology not to lose ground in the market. At present the market position of "A" is very good and compared to its competitors, it offers advanced technology. But some competitors are currently investing a lot of money in new technology the consequences of which may be a stagnancy of "A" and possible competitive setbacks for "A" within the next few years.

This situation is clear to the board members of "A". However, there is one person with a different approach and strong influence, he is the founder of the company who has still a huge share in the assets of the company and an influential seat on the supervisory board. He did a very good job in the past. The company was permanently expanding. But now he wants to minimise the entrepreneurial risk with the consequence that he does not want to support long-term investments. He prefers a higher dividend in the next years for the price of a shrinking competitive advantage. The board members who want to strengthen the position of the company in the long-term have analysed all the key data of the company. According to their results there is a huge potential that can be lifted by "A", but not without deciding to invest in new technology. This is the point where the finance investors join the game. The management of "A" presented the long-term outlook for the company, including opportunities and trends, within the framework of the bi-annual report for the shareholders and on occasion during personal meetings.

The analysis of the board members convinced the finance investors to favour the plan to invest in new technology in the form of the latest IT hardware and software. After intense discussion, the finance investors did finally also convince the majority shareholder – the founder of “A” – that this decision was the right one and inevitable in preparing “A” for the future. In this specific case, it was the group of investors who did finally push the decision with regards to technology strategy, but not because of their expertise in that area. It was simply the management analysis that convinced the investors to agree to the investment proposal. They are used to driving decisions based on complex data collection and analysis. For the founder of “A”, too many assumptions and variables are a little frightening, because he is afraid of harming the company with incorrect decisions that involve significant investment. The investor is clearly indicating that the competence to decide which technology is appropriate and necessary is in the hands of the management of “A”. For the investors, it is just about making a decision based on an analysis made by the expert committee. This is where an experienced investor is often more skilled and better able to make a decision. If they have not been involved in the preparation of the data, they can make their decision objectively. CEOs are sometimes said to be in love with a specific technology or project and so unable to make the best decision for the company.

Findings from the company “A”

The specific case of company “A” showed regular, but not very tight contact and information exchange between the company management and the investors. Active involvement of the investors only occurred when investment or other significant decisions were to be made. A distinctive situation in “A” is the fact that several of the minor shareholders are customers of “A”, with direct contact to the management. They sometimes try to exert influence during personal meetings with the management of “A” to generate an individual benefit for themselves. No investor involved in “A” had directly exerted influence on the technology strategy. The investors consider the company management to be the panel of experts who have to prepare the decision making process so that

finally, when the investors are involved, a decision can be made on a presentation of pure facts and figures. One of the investors interviewed described the pre-investment phase as the most important phase of the investment, during which all aspects, including the technology strategy are evaluated.

The outcome of the interviews summarised in brief

1. How often do investor and investee communicate?

→ “A” provides a detailed financial report to all investors twice a year. Besides that quarterly calls take place during which the investors can ask questions or make comments that will be heard by other shareholders as well. Personal meetings with the institutional investors are arranged on request, but not more often than 3-4 times a year. In between, phone calls are made and emails are exchanged, but on average less than once per month.

2. Who (position/responsibility) communicates with whom (investor/investee)?

→ Direct communication between the investors and the portfolio company occurs between the asset manager on the investor side and the CEO or another board member at the portfolio company. There is no contact between an investor and a management level other than board level.

3. Which communication methods are used (e.g. email, phone, personal meeting)?

→ The standard tool for direct communication is phone and email. Personal meetings rarely take place (just 3-4 times/year).

4. Are reports made regularly? If yes, what is the rough content of the report (key figures, projects,...) and who prepares/receives it?

→ The only detailed report is the bi-annual report that is published on the website as well. It sometimes happens that shareholders ask for specific information by phone or email, which can be given if there is no risk of this giving the requester an unfair advantage compared to other shareholders. The

management team of “A” is very careful not to compromise the laws and regulations in place against insider trading.

5. Do the asset managers specialise in specific sectors, markets and/or products? If yes, what is the reason/justification (experience, expertise, individual interest,...)?

→ The asset managers of the 4 finance investors involved have a good knowledge of “A”’s activity in the brokerage and investment area. However, none of them has specific knowledge on the technology used and applied to make the things work. They thus rely fully on the data and analysis prepared by the board members. In some cases 3rd party expertise is requested to ensure that the analysis was done properly both in terms of tools and data.

6. When do the investors involve or request 3rd party know-how and/or advice? Who is/can be the 3rd party (specific division of investor, independent consulting company,...)?

→ In an environment where the finance investors have no dominant share, they cannot request third-party expertise. However, it was commented that this is common practice in the pre-investment phase in case of major investments and for significant business decisions. If the investor has enough power to force the portfolio company to hire third-party advice, it has to happen. In other cases the asset manager will recommend such action.

7a. How much do investors care about the technology strategy of their portfolio companies?

→ It is an important area and each of the 4 finance investors involved is interested in the technology roadmaps developed by “A”. Control of and the generation of such roadmaps however is solely the task of the portfolio company. It often happens that companies draft wonderful technology strategies for manufacturing or product engineering, but without a stable business case to back it up. This is where finance investors often do intervene. It is an absolute must that all commercial analysis has already been done before the roadmap is presented. Otherwise too much time is lost on discussion that might be obsolete after the figures have been analysed.

7b. If they do influence technology strategy, on what basis do they do that (legitimation)?

→ None of the investors directly influences the technology strategy decisions because they are aware of their lack of expertise and know-how in that area. Also, accountability needs to remain with the board members and the CEO. For the finance investors it is purely a game of economics.

7c. From where do the asset managers receive their information (business analyst?, ...)

→ The finance investors have a back office with analysts and in some cases specific portfolio teams to help collect information. Besides that, the asset managers who have been in the business for a long time have a good network so that they know where they can ask for support to be able to judge something.

8. What is the link / relationship between marketing, organisation, finance strategy influence of an asset manager and technology strategy influence?

→ Financial targets are key and all decisions related to the organisation, marketing etc. have to make sense in a way that the boost to the company value is greater than proposed expenditure. All this can negatively impact the technology strategy, e.g. due to financial or personal restrictions. In the case of "A" however, the finance investors initiated nothing in that direction due to a lack of power.

9. Which tools can/do investors use to measure/judge whether the technology strategy of a portfolio company will guarantee success in the mid to long-term?

→ The investors do not directly evaluate the technology strategy itself. It is the overall business case that counts. Depending on the investment, involvement of a third-party company may be recommended by the investors.

10a. What opportunities do investors have to exert influence on their portfolio companies' technology strategy?

→ There is no reason and in most cases also no justification for a direct influence on technology strategy. The management of the portfolio company has the expertise and is accountable. In the case of "A", the investor base could

try to exert influence by requesting the management to move in their direction, but it would just create a negative atmosphere and is not in line with “A”'s philosophy.

10b. What are the mechanisms/dynamics of influence? Do managers hide information – if yes/no – why?

→ Usually the portfolio company management presents a business case or an analysis and already has an idea or a wish in which direction it should go. If there is some flexibility in the interpretation of data, a certain manipulation is definitely an option. However, company management has to be very careful. The asset managers are normally not able to identify minor points that might be hidden or explained incorrectly. But if third-party expertise is acquired and such an issue were to become visible, it would harm the management significantly.

10c. Are all investors (and asset managers) the same or are there differences between them?

→ For each investment case, each company and each investor are unique in detail and on the personal level. There are too many parameters and influencing factors, one case can never be like another. For sure there are similarities and over time things happen repeatedly, but generally each case has its own DNA.

11. Is technology strategy indirectly influenced by e.g. budget decisions?

→ Framework parameters like available budget, the people in charge of decision-making, etc. definitely play an important role. Some investors put strong pressure on the management of their company portfolio when they are convinced, e.g. that they do not have the necessary expertise. Equally, when the budget is cut to the minimum to avoid too much of a negative impact on the EBIT, technology projects and roadmaps can become obsolete.

12. Do investors act as consultants concerning technology strategy and organisational learning? If yes, what are the consequences and results?

→ The investor himself cannot positively contribute to the area of technology strategy. For organisational learning, investors do often bring in new aspects, such as reporting systems, requirements for specific KPIs, ERP systems and

internal processes, due to their experience with other companies. Generally speaking, the less experience a company has from the outside (through e.g. fluctuation in workplaces), the less up-to-date are the processes and the procedures. In such cases investor involvement can really be a kind of consultation, but on a very basic level.

13. Are there cultural differences between different investors?

→ In the case of “A”, all the investors involved act and think equally. They want to be up-to-date on what is going on in the company in which they have invested, but they do not intervene strongly and put no pressure on the management for any specific decision.

The case of company “B”

Data collection

Analysis of the investor – portfolio company relationship of company “B” used both primary and secondary data. Secondary data was gained through the study of annual reports, the company websites, press releases and articles. Primary data was gained through four personal interviews at top management level at the portfolio company. From the investor side, one asset manager involved in the investment in the period from 2000 to 2005 was interviewed.

Company background information

“B” is today a major supplier to the global automotive and commercial vehicle industry. The germ cell for the company was a saddlery that was founded in 1880 in southeast Germany. In 1954 the grandson of the founder registered a company for the production of tractor seat cushions. In the first years it was a one-man show. The products were purely customer specific and he even visited farmers personally to hone specifications for the product to be manufactured. Today the company has around 8,000 employees in 17 countries and the annual turnover is close to 1 billion EUR. With a diversified product portfolio the company supplies different markets for both on and off-road vehicles. The first step of real B2B was the supply of seat cushions to local German tractor manufacturers in the late 1950s. Relatively simple products made from polyurethane foam and vinyl or leather – at that time however polyurethane foam was a revolutionary new material.

Driven by the innovativeness of the founder, in 1964 not only a seat cushion, but a complete suspended seat for agricultural machineries was launched on the German market and later exported to other European countries and the Americas. Over the years the products have been continually improved to offer the customers state of the art technology at all times. After an initial single metal

bar to provide a minimum of suspension, more complex mechanics with mechanical springs, air springs and even dampers followed. In the early 1980s, new markets were entered through diversification of the product range. The first new segment was the production and sale of swivel office chairs with height adjustment in 1980. Only two years later, 1982, a generation of suspended driver seats for trucks was developed and successfully launched.

In 1985 seats for public transport and interior components for passenger cars were added to the product portfolio. In the public transport segment, the main customers were bus manufacturers and train manufacturers. Prominent examples are the seats in the German ICE and the Transrapid. Full seats were not developed for passenger cars, only headrests and later centre consoles and door panels. The main synergies between all segments are the foaming and coating technologies. Since its foundation, the company has always been driven by the founder's will and engagement to discover new markets, to develop new products and to grow the company. During a speech he gave at the company's 50th anniversary, he said that he was never satisfied with what he had achieved in his professional life and that had been his main motivation for continuous research and development activities. He was always searching for something new that would offer him the chance to increase the turnover of the company, to strengthen its market position and to offer the best portfolio to the customers.

The company grew mainly as an intact company, but a few acquisitions were made in the 1980s and 1990s. A magic number that was targeted in the 1980s was an annual turnover of 1 billion Deutsche Mark. That was finally reached after acquisitions mainly in the automotive segment. The company is today structured in two main divisions. First, the seating systems division, for which the agricultural sector is still a major market, with an annual turnover around 350 million EUR. And second, the automotive division with the dominant annual turnover around 700 million EUR. In the seating systems division, a business unit structure is in place that reflects the corporate history. It contains the passenger seat business, the highway seat business and the off-road seat

business. In the year 2000, the office chair division was sold as part of a restructuring activity and a plan to concentrate fully on the motorised vehicle market again.

The role of technology in company “B”

Decisions regarding technology are key to the future market position of “B”, both in terms of product specification and production process. In all markets, “B” has just a handful of competitors and the decisive factors for market success are product specification and prices. If a supplier can bring a feature first to the market, it can make him single source in that segment or for certain customers. The same can happen if a process innovation allows a company to offer products at a lower price than all the competitors who do not have the capabilities to utilise the new production technology.

Innovations in the business field of “B” are e.g.:

- Cooled seats by adding cooling fans and a specialist secondary layer below the fabric or leather.
- Electronically controlled suspension to adjust to road or ground conditions.
- Lumber support adjustment including a full backrest shape with a mechanically adjustable backrest angle to guarantee the right position with fewer adjustment elements.
- Use of new materials to reduce weight and allow a more attractive design due to better characteristics also with regard to crash tests and homologation
- Crash active headrests that change the headrest position in the event of a crash.
- Moulding of hard and soft material in one shot, for e.g. door panels, dashboards, etc.
- Replacement of a very complex valve with around 80 single parts by a very simple solution with less than 10 parts.

In all such technological innovation, different factors play a role that is sometimes neither necessary nor sufficient, but supportive. Most of the technological innovations developed by “B” come from an advanced engineering department. The most valuable input for this department comes from internal Kaizen processes as well as user observational research. Some projects that were put on hold because they were not high priority are continued undercover. One of the interviewees called that sort of project and activity submarine projects, because these activities are below the top management’s radar. These projects are not budgeted and no status or progress report is made to the top management. All work is done “in between” during a working day, when there is sufficient slack to move forward with the undercover project or in the evenings or even at weekends. The people involved are extremely motivated and enthusiastic about such projects as they experience a feel a strong sense of self-fulfilment when their work is finally recognised by the company management. The motivations for such activities links satisfaction with the relationship employees have with their employers.

Having said that, an advanced engineering department significantly increases the probability that technological innovations are developed. Another incentive for “B” is to receive specific RFQs or development orders placed by customers. While self-initiated research activity is fully upfront financed, the advantage of customer-driven projects is a funding that often covers 100% of the cost. In return, exclusivity normally has to be guaranteed for a specific period. As the products are very complex and made with up to 500 single parts, including safety devices, customers normally cooperate just with one supplier for new projects, which in turn guarantees a stable turnover if the product is accepted by the end customers as well. In the seat market a dilemma that becomes more significant with each new project is the need for safety and standards compliancy on the one hand and weight reduction on the other hand. Thus the need for new solutions to absorb the forces of a crash test or pull test in the seat structure are key, no matter if realised with new materials or improved design.

Ownership structure

Until 1996 the company was not publicly listed but in 100% private ownership of the founder and his family. In 1996 the legal form of the company was changed to a publicly limited company through an IPO on the Frankfurt stock exchange, still with the founder's family as the dominant shareholder. However, in 2000 the ownership structure changed significantly. As part of a fundamental restructuring, during which the office chair division was hived off, a major portion of the shares was sold to a private equity fund company. This investor was on board until 2005. In 2005 a second public offering followed and for a short time more than 90% of the shares were free floating. In the meantime, a few finance investors once again acquired packages between 2 and 10%, but since the 2nd IPO the free floating portion has always been above 50% and no shareholder has had a package above 10%.

Interaction with investors

In the last decade "B"'s ownership structure has significantly changed a few times, as mentioned in the previous paragraph. The management has been confronted with all sorts of different types of shareholders, starting from the private owner via the private equity fund as dominant shareholder to a more diversified ownership without a dominant shareholder. Some of the interviewees had been working for the company for more than 10 years and could comment on the differences brought about by the different ownership constellations. While the founder of the company would regularly walk through all departments including the shop floor, interaction with the private equity investor was totally different. Instead of frequent personal visits and discussions with people at all hierarchy levels, the private equity team met only the board members. Personal meetings were scheduled 3-4 times per month depending on the issues that were on the table. Conference calls were scheduled monthly or on specific occasions also at short notice.

At the meetings the participants from the investor side were always only the asset managers, that is no analysts or experts. There was never discussion about technological details or technology strategy. The asset managers were purely figure driven and interested only in cash flow calculations, finance mathematics and KPI. Of course, any plan for investment either through direct expenditure or through allocation of workforce had to be presented to the major shareholder, but when the presentation was viable in itself, agreement was normally given immediately. When the investor had doubts, for whatsoever reason, a potential consequence was a request to the board to provide expertise from an independent expert or consultant. During the time when the investor was involved, there were a few occasions when Roland Berger, the Boston Consulting Group or the Fraunhofer Institute were contracted to analyse a specific business case or scenario. Direct influence from the asset managers or their back office analysts never happen. They have always considered the board members to be the expert committee who forward proposals with their justification or proof that this is the right and the best thing to do with the available resources.

The asset managers did ask for specific changes in the company with regard to KPIs. The control system was historically not very strong and only a few parameters and numbers were monitored and tracked regularly. Following a request from the major shareholder, several cockpits were implemented to give a quick overview on e.g. major projects, complaints, sales, etc. One of the board members said that the improvement and standardisation in reporting was very positive and beneficial for both the company management and the investor. However, again no comment or indicator regarding technology was included. The reports concentrate wholly on comparisons between plan and actual cost, timing and quality. In the past, project budgets were updated annually, but no fundamental consolidation of all project related spending was made and supervised. An R&D controller was installed driven by a request from the private equity investor, and the full product development process was revised with the support of external experts. The final outcome was a

standardised product development process including quality gates, steering committee and a corresponding reporting tool. At the end of the day the request to improve and detail the control and reporting systems produced a fundamental change in the R&D process in recognition of the norms and standards being introduced in the vehicle industry.

Similarly, further detailed and standardised analysis was requested at the key account level to analyse, e.g. average margin by key account, to identify of loss makers and investigate possible actions to clean the portfolio and to be more selective when new products are quoted. In this area the asset managers are without any doubt experts, regardless of the product segment or industry. When it comes to decisions regarding product or technology, the asset managers rely on other people's expertise. In many cases the board members, with the entire management team in the background, can successfully present a potential business case without further evaluation by consultants. In some cases however it is crucial that an idea, concept or strategy is re-evaluated by a third-party. The cost for that third-party advice has to be paid for by the company. Preparation for decision-making, said one board member, was also very much appreciated also by other shareholders and the advisory board as it strengthens the foundations on which decisions are built. When cases were presented which did not meet the financial conditions of the private equity investor, they were rejected straight away, without further analysis from within or outside the portfolio company. The rules are very straightforward when expected returns cannot be delivered.

Since the private equity investor as a major shareholder exited the investment the situation has changed significantly. At present there is no dominant shareholder. All packages held by institutional investors are below 10% ownership. Nevertheless, some of the investors would like to play a role similar to that of the private equity investor as a major shareholder. They call frequently and ask for personal meetings. The similarity to the other situation lies in the fact that the expertise of these investors is also more in the area of general

management, analysis and management accounting systems. Technology strategy is not and never has been a hot topic because of the technological directions proposed. When it comes to discussion about technology then it is always due to the associated spending and/or the market. Investors who ask for personal meetings, due to the legal requirements, can neither get more information than the other institutional or private investors, nor can they exert influence. A board member has to think very carefully about the consequences of such meetings because they have to assume liability for all actions. That means that a clever board member will not directly implement an investor requirement, if they are not absolutely convinced that that is the right decision.

Findings from company “B”

The feedback from the interviews was that all the investors with a significant package of shares in their portfolio showed interest in the actions and activities at their portfolio companies. The level of interest and engagement is equivalent to the financial significance of the company in the investor’s portfolio. In general the management of company “B” welcomed investor involvement. The main reason is that the investors asked for detailed analysis and justification of decisions made by the portfolio company management. When the investor was involved in the decision making process even stricter regulations were put in place. Before active investors were on board, it was possible to drive decisions without a scientifically convincing projection of the outcome and corresponding results. The stricter approach can be regarded as a very professional and scientific approach that minimises failure. On the other hand, it does kill creativity and the potential that is created when one is willing to take a risk, even if the outcome cannot be accurately predicted. Trust in gut feeling and experience is not possible when the environment is too formalised and stringent. However, in the eyes of the top management this lifts a load from their shoulders, because then decisions are not made by themselves as individuals, but as the outcome of analyses and investigations.

A key outcome of this case was that the investors never tried to influence directly decisions regarding products, the production process or technology. Their role was merely to agree to proposed directions and projects or not. When disagreement was expressed, it was either a no or a request for further external opinions and expertise. The investors considered themselves to be more professional in the areas of management accounting and business analysis than the management of their portfolio companies. Regarding product and process know-how and technology strategy however, it is clear that know-how was entirely in the hands of the company's management team and the employees. In some cases the investor influence did affect the technology strategy direction taken by the company, but never because of a direct influence in the decision making process by proposing a specific roadmap. When the technology strategy was affected then only because the methods and data used to analyse and evaluate both the current situation and the future outlook were more standardised, formalised, mathematic and data driven.

The outcome of the interviews summarised in brief

1. How often do investor and investee communicate?

→ Regular "keep-in-touch" calls to bring both sides up to speed on the actual situation were scheduled on a monthly basis. Personal meetings were not scheduled on a regular basis, but more on a case-by-case basis. On average, such personal meetings happened every second month. In the case of budget approval, restructuring, mergers and acquisitions, the close involvement of the investor including personal meetings, phone calls and emails was expected and requested.

2. Who (position/responsibility) communicates with whom (investor/investee)?

→ Usually it was the asset manager of the investor side who kept in touch with the CEO of "B". Other board members of "B" joined the personal meetings, but not usually without the attendance of the CEO. No analysts or other back office staff joined the personal meetings, but they did take part in the phone

conferences. The CEO insisted on being copied in on any communication from “B” to the investor.

3. Which communication methods are used (e.g. email, phone, personal meeting)?

→ The dominant tool for communication is email, followed by phone. Both channels were used by “B”, on average 5 times per month. For complex or delicate issues, phone calls and personal meetings are definitely preferred. The monthly “keep-in-touch” call was organised as a phone conference to enable different people to dial in and follow the meeting. In such calls it was standard for members of the investor’s portfolio team to join.

4. Are reports made regularly? If yes, what is the rough content of the report (key figures, projects,...) and who prepares/receives it?

→ A monthly reporting system that includes a tracking cockpit for projects, global and regional financial figures, highlights and lowlights for strategic customers was installed after the private equity investor became involved in the company. One of the first actions was to define a comprehensive reporting system to guarantee that the investor is permanently up-to-date regarding all key actions. A comparison of both year to date and actual had to be included for all the figures that were also part of the budget. A bridge to explain any deviations was requested as well.

5. Do the asset managers specialise in specific sectors, markets and/or products? If yes, what is the reason/justification (experience, expertise, individual interest,...)?

→ Asset managers very often do have excellent knowledge and experience in specific regions of the world or in specific markets. On a product or process level however expertise is normally not extensive. If an asset manager happens to have similar expertise in a business like the portfolio company than it happens just by chance – it is never a rule. Besides the potential positive effect this brings to the portfolio company, facilitating better decisions, it could also have the negative effect of the decisions being too much driven by the asset manager. The consequence may be conflict regarding accountability. Thus,

even if an asset manager has fantastic expertise, it does not necessarily mean that the best possible result will be achieved.

6. When do the investors involve or request 3rd party know-how and/or advice? Who is/can be the 3rd party (specific division of investor, independent consulting company,...)?

→ Involvement by an external, independent consulting company in the pre-investment phase is quite standard when a finance investor is considering buying a significant amount of shares. And this was the case with “B”’s investment. Furthermore, if important and cost intensive decisions are on the agenda, external consultancies again are one of the preferred sources for advice and analysis. In most cases the investor will give a recommendation or even prescribe which consultant to be hired for a specific analysis. The portfolio company however always pays the bill. On request of the portfolio company or by recommendation of the asset manager, analysts from the investment firm can support the portfolio company in certain issues, mainly relating to business planning, reporting and financial analysis.

7a. How much do investors care about the technology strategy of their portfolio companies?

→ The investors see the area of technology strategy as a key area for long-term development and value evolution of a portfolio company – just as the management of the portfolio company does, the difference being that the investor is not really interested in the technology itself, just the outcome that can be achieved by following a specific technology. The business case has to be prepared in detail so that it is fully transparent when presented to the finance investor.

7b. If they do influence the technology strategy, on which basis do they do that (legitimation)?

→ In the case of “B”, the finance investor who was interviewed and the other investors who followed on afterwards were very careful when making direct judgements about products or process technology. Feedback from them was always holistic and related to the complete business case, never individually to

a specific technology or technology strategy. It is very clear that the portfolio company management is accountable and wrong decisions could result in a management change, driven by the finance investor.

7c. From where do the asset managers receive their information (business analyst?, ...)

→ Sources that were used regularly were internal portfolio teams, analysts, expert panels who were known in the finance investor scene and external consultants. As finance investors often bring interesting projects to consultancies, in return they often get quick feedback on specific questions (depending on the relationship). This is more often the case than not. Most asset managers have preferred consultancies, which they recommend or stipulate for their investees.

8. What is the link / relationship between marketing, organisation, finance strategy influence of an asset manager and technology strategy influence?

→ A company is a very complex and sensitive mechanism and all the aforementioned areas interact with and influence the others. Finance and organisation strategy have a strong impact on technology strategy. When an organisation is downsized as a consequence of a restructuring program to optimise cost, certain projects – mostly long term oriented ones – cannot be continued, as the workforce required for them is no longer available. In the same way, strict budget regulations sometimes hinder the pursuit of a technology strategy, simply because the necessary budget has not been approved.

9. Which tools can/do investors use to measure/judge whether the technology strategy of a portfolio company will guarantee success in mid to long-term?

→ Success of the technology strategy is measured through the internal company reporting system and the external analysis of the aforementioned consultants. The investor does not normally judge whether a technology strategy is right or wrong. They decide if a business case is interesting based on figures developed by the company management. When the assumption does

not match reality, the expert panel who made the incorrect decisions, i.e. company management, is accountable.

10a. What opportunities do investors have to exert influence on their portfolio company's technology strategy?

→ In the case of "B", neither the investor nor the private equity investor had direct influence, nor did the other investors who followed after 2005.

10b. What are the mechanisms/dynamics of influence? Do managers hide information – if yes/no – why?

→ A CEO might have a clear idea about the technology strategy they would like to follow. If this is the case, they can definitely influence the analysis and the business case in a variety of ways. There are various databases available from which data for a business case can be built, but the data can differ from database to database. Data can be selected according to the desired outcome. What is white will not become black, but there are plenty of shades that can be generated instead of white or black without lying or even hiding information. But, for decisions that are related to huge investments with high significance for the company, it is almost taken for granted that third-party expertise will be hired. This is also known to company managements and thus to hide any information or to influence the evaluation in a way that it is immediately transparent to another expert panel would not be clever. What a manager can do if they want to push in a certain direction is to seek out independent third-party analysis that supports their position. Such external data combined with a clear and irrefutable internal analysis can be sufficient to convince the investors to give the "B" the green light. These are little elements that drive mechanisms and allow the portfolio company management to gain momentum in discussion and negotiation with the finance investors.

10c. Are all the investors (and asset managers) the same or are there differences between them?

→ In the case of "B", both the private equity investor who was involved from 2000 until 2005 as well as the later investors after 2005 behaved in the same way. A difference however was the distribution of power. The investors who are

currently engaged all have minor share packages, whereas the private equity investor had a dominant package and therefore more power to influence decisions. A certain specialisation of the investors was confirmed.

11. Is the technology strategy indirectly influenced by e.g. budget decisions?

➔ The overall available budget and the investment necessary to follow a possible technology strategy are strongly linked. In the case of “B” a project for a new seat concept was not approved because the market launch was scheduled for a period when the private equity investor assumed they would have sold the company. What was decided, was to start a project based on an existing product with minimum effort, in order to show prospective buyers of “B” as well as the current customer base that something new was in the pipeline. The experience of the management of “B” is that all the investors were clever enough to realise that a well-designed project, product and technology pipeline is vital for the successful sale of a company like “B”. But ultimately a buyer will often be aware that an acquisition will not deliver everything promised by the previous owner.

12. Do investors act as consultants concerning technology strategy and organisational learning? If yes, what are the consequences and results?

➔ Definitely not for a long-term technology strategy, which would be necessary and vital for the long-term survival of a company like “B”. Regarding business practices, e.g. project management, for all different kinds of processes, e.g. efficient reporting, temporary involvement can result in significant improvement. This happened with company “B”, as described in the background information for this case. Due to the positive effect, all the managers of “B” who were interviewed remarked that the involvement of the finance investor had been a positive experience for the company as well as for themselves as individuals.

13. Are there cultural differences between different investors?

➔ The feedback from the interviews with people from “B” was that the investors often have worked outside Europe and thus they act more or less all within the same cultural framework. No one, either during the time at “B” or at another company, had experience of an investor who had wanted to push through a

fundamental change, either in the area of technology strategy or anywhere else. The personal experiences reported were all characterised by a general sense of cooperation and approval.

The case of company “C”

Data collection

Analysis of the investor – portfolio company relationship of company “C” used both primary and secondary data. Secondary data was gained through the study of company websites, press releases and articles and internal documentation, which was made available. Primary data was gained through three personal interviews at top management level at the portfolio company and two interviews with investors.

Company background information

“C” was founded in the 1950s in Chicago/USA to manufacture electrical snap switches for household appliances. While expanding in the US by entering the vehicle market, a significant expansion was also taking place in Europe in the 1960s and 1970s. After making in-roads in Europe with their copy-paste products from the United States, in the mid 1960s first key switches and then complete computer keyboards were developed and launched with great success on the global market. In the decades following the launch of the first keyboard, the products made by “C” were the benchmark and renowned for their reliability. Step by step, sales offices were opened in most European countries. In 1977, “C” went public in order to generate the cash that was used to invest in a semiconductor business. The semiconductor business was quite different from the original core business, but very profitable.

Two manufacturing plants were built in Germany and a third European plant followed in the 1990s in the Czech Republic. In the USA, the company grew until the end of the 1990s, when a downturn in the automotive industry hit “C” very hard. In the early 1990s, a second public offering followed to finance some restructuring within the group as well as a first factory in China. In 2000, the semiconductor business was sold to a large American electronics company.

The reason for the sale was to generate cash to buy back shares to become independent from external investors. Today “C” employs around 2,500 people around the world. The annual turnover is around 400 million Euro.

The role of technology in company “C”

In the first year of business, “C” manufactured a small range of electrical switches for home appliances. From the mid 20th century until today “C” was very active in the market for electrical switches. The trend was always to make the products smaller, to improve performance and to adjust them to the specifications currently applicable in the respective markets. Originally switches were used to switch load currents directly and needed to be able to handle large currents. Now relays are used to switch the load currents and the switches only control the relay, requiring typically only a few milliamps (for an ECU standard device). Today “C” produces about 450 million switches and is the world’s market leader. The majority are manufactured on fully automated assembly lines in Europe and North America with just a small portion currently produced manually in China. The production processes are a key element for “C” as the reliability of the products is strongly linked with the processes and the speed of the assembly machines that have to be run as fast as possible to minimise the cost per piece. The assembly machines run 24/7 the whole year round. Only at Christmas are they switched off for a few days of maintenance.

Another key element is the development and selection of the best materials, as the parts are used in a harsh environment. Temperature in the area of usage ranges from -60° C up to +155°C and the products also have to be able to withstand contact with silicone, grease, oil and other fluids and gases. The sealing components have to be carefully selected and tested, particularly the waterproof switches. Nevertheless, the perfect product has not as yet been found, because even the waterproof switches are not gas proof. A silicon-containing atmosphere was not a problem in the past, when deposits at the contact area were just burned away when a few amps were switched. Today with decreasing electrical loads this is not the case, with the result that an

insulating layer can form very quickly. “C” has already been confronted with two serious complaints from Automotive OEM customers, where in one case a person died due to malfunction of a switch resulting from silicon contamination. As an extension to the switches, “C” started to develop a highly advanced overmoulding technology, that allows integration of the lead frame into the plastic material that simultaneously is one shell of a normally two shell housing. These parts are typically used for ABS systems, locking systems and several other electromechanical assemblies in cars and also in home appliance applications. Selection of the right material, the right temperature treatment during the production process and the parameters for the movements of the tools are very critical here again.

Before the plastic material is injected into the tool, the lead frame is fixed with little metal bolts. As the lead frame is going to be fully overmoulded afterwards, the bolts have to be moved away slowly after the plastic material has been injected. Slowly enough to avoid the lead frame being removed at the same time, but fast enough to ensure the plastic material is still viscose enough to fill the space that was opened by the bolts. Many but not in all of these parts will also include micro switches. In the past they were soldered on, which is not the safest process. Today it is clear that welding is much better, when the parameters are exactly controlled and in fact “C” is working on the implementation of this technology at present. Further application fields in the automotive sector are electronic control units for window lifters, electric tailgates and gear shifter applications. The most advanced technology currently being used in this area is the use of inductive coils that are printed on multi-layer PCBs. A high frequent voltage is applied to these coils, which is permanently measured.

By moving a non-ferrite material above the coils, they are dampened and subsequently the signal that is measured is altered, i.e. the amplitude is reduced. This technology is borrowed from the home appliances sector that is described later on. For the first launch on the automotive market with gear

shifter applications, the new sensor was designed in such a way that the moving element always covered a minimum of three coils with the effect that when one coil was defect, the system would still work. A huge advantage compared to Hall sensor technology, which can be applied similarly, is that the sensors are free, as they are made from the copper that is on the PCB anyhow. This technology led to a completely new product range for “C” with incredible market success.

In the household appliance market, the switches are used in infrared applications, for today’s state of the art ceramic stove top controls. This application, based on the inductive technology above, is based on detecting the size of the cooking pot. In this case the coil is much bigger and the cooking pot and acts as the damping element. In this segment “C” is experiencing a good and stable return. New investments and available resources are mainly allocated to automotive applications, as the annual volumes are greater and consequently the potential growth rates are greater. The third field in which “C” is active is the manufacture of computer keyboards and mice. Over the past few decades this was a top business field for “C”. Today “C” still has a good market position for keyboards with improved functionality for professional users, such as card readers, finger print detection and such. In the mainstream market however, “C” has lost ground in standard products as “C”’s cost base is killing competitiveness on the one hand and on the other hand it does not have the multi-functional keyboards used by gamers in the product range.

Ownership structure

Following its foundation in 1953, “C” was in 100% private ownership until 1977, when a public offering changed the ownership situation. In 1977 “C” had a successful IPO and generated a good amount of cash to allow further diversification. In the early 90s, a secondary offering followed to finance some restructuring and expansion into the Chinese market in the form of a manufacturing site. In 2000, the family decided to sell the semiconductor division to be able to buy back the majority of the shares of “C”. Even during the

time when “C” was a public company, the family always owned a minimum of 55% of the shares. The packages of the biggest non-family shareholders were always below 10%. Some finance investors held packages of around 5% of shares, whereas just a few percent were free floating. A significant difference between this example and many other public companies is that the CEO was always a representative of the founders’ family and a majority shareholder.

Interaction with investors

When the company was publicly owned with shares held by outsiders, the CEO of “C” had frequent contact with the large shareholders. Occasionally, a small shareholder would get in contact, but this was clearly the exception. For the CEO and the managers of “C”, it was clear that they had an obligation to run the company for the benefit of the shareholders. The challenge for the CEO, as representative of the 55% majority of the shares, was to be sure that his interests were well known to the minority public shareholders. As the majority owner he had to be mindful of the interests of the minority, without letting them run the show. That is, if he was really committed to a particular position or strategy, he could not allow himself to become too defensive. But then again, just because a minority shareholder held a contrary view that did not mean that he had to change his. Whatever the ownership structure, the shareholder can sell, of course. Nobody forces a shareholder to buy stock and nobody forces them to hold on to stock. They all knew that what the ownership structure of the company was when they bought their shares, but that did not nevertheless stop shareholders from making their interests known.

During the period when “C” was a public company, face-to-face meetings with a handful of the biggest non-family shareholders (all of them funds) took place a couple of times a year. In most cases breakfast, luncheon or dinner meetings. The shareholders generally requested key figures and an executive summary of the current condition and the outlook for the next months (book to bill ratio, etc.). In several meetings shareholders made comments on what could be done differently in terms of market approach, but never specifically regarding the

technology. Some just wanted to give friendly advice, others were more demanding and in rare cases, letters were sent to the advisory board. At the end of the day, the minority shareholders were never able to exert influence on the opinions of the majority shareholder group. External consultancy was not sought due to minority shareholder requests, but due to a majority shareholder decision. Sometimes the banks requested 3rd party expertise to release a credit package. For the minority shareholders, if they strongly disagreed with results or perspectives of “C”, the only option open to them was to sell their shares. They were aware of the limitations of power and did not waste their time on endless discussion or battling with the majority shareholders. The shareholders had no real influence.

Findings from the case of company “C”

The asset managers representing the funds that had share packages in “C” met regularly with the company CEO. Besides a general exchange on current business and delivery of an outlook based on the latest information, no exchange happened. It is interesting that the people from the finance investors did ask about product strategy for the coming years, but never tried to give advice or comment positively or negatively directly in the meeting. According to a finance investor with a small investment in “C”, when direct influence is very limited, such data is collected for internal analysis. Based on this information, market studies are done to estimate how competitive “C” will remain or become in the future. The technology strategy in the long term is of secondary importance to the investor. What counts is the product portfolio and the market share, which at the end of the day is also a result of the technology strategy, but development of technology strategy and turning it into reality is the job of the portfolio company management.

The outcome of the interviews summarised in brief

1. How often do the investors and investee communicate?

→ A regular phone conference accessible to all shareholders was organised for once a month. Personal meetings with the institutional investors took place 2-3 times a year, when they could easily be combined with other meetings in the region for the investor or the company CEO. Emails, letters and phone calls took place only very rarely.

2. Who (position/responsibility) communicates with whom (investor/investee)?

→ Only the portfolio company CEO ever met with the investors. From the investor side, only the asset manager joined the meetings. The first line management of “C” also took part in the conference calls as well as some back office people from the institutional investors.

3. Which communication methods are used (e.g. email, phone, personal meeting)?

→ The communication channel most used in the case of “C” was the phone/conference call and personal meetings.

4. Are reports made regularly? If yes, what is the rough content of the report (key figures, projects,...) and who prepares/receives it?

→ A quarterly report was produced to inform all investors about the latest financial situation. This report did not include details on the project or product level, but was quite general and finance driven.

5. Are the asset managers specialised in specific sectors, markets and/or products? If yes, what is the reason/justification (experience, expertise, individual interest,...)?

→ The asset managers involved in the investment of “C” were knowledgeable about general market trends, such as sales volume of cars, etc., but definitely not experts when it came to product detail and /or processes.

6. When do the investors involve or request 3rd party know-how and/or advice? Who is/can be the 3rd party (specific division of investor, independent consulting company,...)?

→ In the case of “C”, 3rd party expertise was never sought at the request of a finance investor. External consultancies were booked a few times to do some analysis to generate a basis for decisions to be made at that time, but the initiative came purely from the company management. In this case the finance investors did not involve 3rd parties in the pre-investment phase.

7a. How much do investors care about the technology strategy of their portfolio companies?

→ The funds engaged in “C” did care about the overall business situation and were interested in hearing about how the technology strategy developed. But, in fact the focus of interest was to understand what “C” intended to achieve by the strategies defined.

7b. If they do influence the technology strategy, on which basis do they do that (legitimation)?

→ There was no attempt to exert influence on technology strategy at “C”.

7c. From where do the asset managers receive their information (business analyst?, ...)

→ The information that asset managers have available generally came from the back office, i.e. the analysts and experts at the fund companies.

8. What is the link / relationship between marketing, organisation, finance strategy influence of an asset manager and technology strategy influence?

→ According to the management of “C”, the proposals that some shareholders made such as focusing on one market segment or product line would have had direct consequences on the technology strategy. But in fact at “C” no real influence by any investor was exerted over all the years. In some cases it was exhausting to explain again and again why certain investor advice was not followed.

9. Which tools can/do investors use to measure/judge whether the technology strategy of a portfolio company will guarantee success in mid to long-term?

→ It is the analyst community at the fund company who prepare and pre-evaluate data so that finally the fund manager in charge of a certain investment can decide to continue or to exit from the investment.

10a. What opportunities do investors have to exert influence on their portfolio company's technology strategy?

→ In the case of "C" the finance investors did not have the power to drive any change and no one tried to do so aggressively, e.g. via media or official letters.

10b. What are the mechanisms/dynamics of influence? Do managers hide information – if yes/no – why?

→ During the phone conferences and meetings, the situation was explained with full transparency. One of the key principles of "C"'s CEO was and is to communicate all plans and ideas openly. Discussion and defence of any decisions in meetings or calls with investors is definitely preferable to strategic dis-information that leads to a surprise afterwards. If the surprises were positive, no one would complain, but that is not always the case. The investor interviewed commented that not all company CEOs are like the one of "C". During his career he had often experienced people who had tried to give selected information to support their own ideas and strategies and to avoid controversy. Such behaviour however does not create a fruitful atmosphere, only mistrust, which makes the lives of both sides more difficult, as the fund managers are responsible for their investments at the fund company.

10c. Are all the investors (and asset managers) the same or are there differences between them?

→ Of the finance investors involved in "C", one was substantially more aggressive than the others and made proposals on which markets and products to focus, but this was more because of the individual person's responsibility. They all have a common target – to earn money with their investment, but the way that they select target companies is different (size, region of activity, etc.).

11. Is technology strategy indirectly influenced by e.g. budget decisions?

→ The money available for research, etc. is limited. Thus if a budget is generally cut it automatically has an influence on the technology strategy, because decisions about where to spend the money have to be made. A comment made by the investor was that technology strategy often changes when the top management of a portfolio company changes.

12. Do investors act as consultants concerning technology strategy and organisational learning? If yes, what are the consequences and results?

→ In the case of “C”, no significant improvement or change within the company originated from a proposal made by one of the institutional investors.

13. Are there cultural differences between different investors?

→ The American investors who were involved in “C” appreciated informal meetings in combination with breakfast, lunch or dinner. German investors prefer a face-to-face meeting arranged purely to discuss business.

The case of company “D”

Data collection

Analysis of the investor – portfolio company relationship of company “D” used both primary and secondary data. Secondary data was gained through the study the company websites, press releases and articles. Primary data was gained through one personal interview at top management level at the portfolio company and one interview with the investor currently involved.

Company background information

Company “D” was founded 1925 in southern Germany as a family business. Starting with 4 employees and a number of home workers, the company produced different products made from knitted wire such as cooking pot cleaners. In the 1950s the product range was extended with products for filtering and noise protection in ventilation systems, again made from knitted wire. After the founder died, his grandson took over management of the company, which was still fully owned by the founder’s family. New developments in the automotive market led to new application fields for “D”. In the 1970s, knitted wire products for catalytic converters were co-developed with and supplied to exhaust system manufacturers and OEMs. The product range extension achieved strong growth for the company, so that the existing shop floor area had to be re-built.

Further innovative products in the automotive business and steady expansion of the filtering applications in the areas of process engineering, electrical engineering and environmental engineering made the move to a new but bigger place necessary. In the 1980s “D” produced knitted wire products for the world market in 8,000 square meters with 140 permanent employees. In the 1990s, the first division outside of Germany was founded. The product range of this facility, which was opened in South Africa, was a copy/paste of part of the

German business. In the same century the founder's family decided to sell all their shares in "D". Before two institutional finance investors jointly acquired "D" in 2005, it was owned by two different company holdings that kept the company for just a couple of years in their portfolio. A milestone for the portfolio was 2002 and the start of production of filtering elements for applications inside of the gas generator in automotive airbags. For these new products a dedicated automatic production line was installed. Another production plan was built in parallel in Hungary to further strengthen the manufacturing footprint in Europe. Today, "D" employs roughly 300 people and achieves an annual turnover of 60 million Euros across all segments.

The role of technology in company "D"

Historically the products manufactured by "D" were not particularly sophisticated in terms of specification. Having started in the early 20th century with a minimal portfolio of knitted wire products such as pot cleaners; tolerances or product specifications in general were not a critical issue. Over time this has changed significantly. By the 1950s the requirements of the extended customer base had changed fundamentally. As "D" s products were being used as components in the assembled products or systems of other companies, it was vital to define specifications and interfaces. The characteristics of a product that is used in an assembly have to be constant or at least within a clearly defined range. The requirements for filter elements in ventilation systems or for noise reduction products in exhaust systems are much stricter than those for a pot cleaner, but still moderate compared to, e.g. electrical components.

Up to now, the specifications for the filter elements that are used in different industries have not been too rigid. But, there have been different products added to the portfolio, such as the automotive exhaust system application, during the last two decades that have set the company totally new challenges. The most critical applications are the safety restraint system applications. Knitted wire products are used to control and soften the explosive effect when an airbag is fired into use. Malfunction could have very severe consequences

both for the passengers in a vehicle as well as “D”. To ensure that the company’s insurers accept liability in case of a complaint, a lot of control systems have to be installed. It goes without saying that the production processes have to be up to date with latest available technology.

This radical change in terms of production process complexity and product performance has led to new RFQs for products made from knitted wire. A difficulty is the price pressure from the Chinese companies that produce goods of a significantly lower standard. Even if the customers request the standard of “D”, buyers regularly confront the sales staff with dumping prices. As a second step, after the upgrade of “D”’s production processes for the existing components, two of the globally leading airbag manufacturers have placed RFQs for complete assemblies. They have had a good experience with “D” even with the new paths and have supported “D” with product and process know-how. “D” stopped producing and supplying components a decade ago and now only manufactures complete assemblies. When in the beginning several parts were bought from an external supplier, “D” built up internal know-how to increase the vertical integration. Being a renowned supplier in the area of safety restraint systems, opportunities in other areas are automatically created. One of the latest projects is again a knitted wire product with new materials that is used in the injectors for diesel engines to reduce the vibration of the vehicle. This project is being carried out in close cooperation with one of the world market leaders for such systems.

Ownership structure

From its foundation in 1925 until 1992, “D” was 100% in the ownership of the founder’s family. In 1992 the company was sold to a large holding that already included 6 other companies active in different areas of machine construction and metal component manufacturing. This ownership was not a long-lasting one and by 1999 the company had been sold again. Again the owner was a holding that already had 5 companies in the area of construction equipment and metal component manufacturing. In 2005 “D” was sold yet again. This time two

finance investors jointly acquired 100% of the shares, each investor owning 50%. This ownership situation is still in place in 2011, but exit strategies are under evaluation and most probably another company will shortly own “D”.

Interaction with investors

The finance investors involved in “D” have a lot of experience of SMEs in Germany. They were actively involved in several investments when the first line of management was taking over responsibility after a former founder and owner was leaving the company to retire. What was and is exceptionally helpful for “D” is the excellent network of the finance investors, through which “D” was able to both identify new and valuable suppliers as well as new customers. With regards to the products of “D” and the technology strategy that changed after the founder’s family shares had been sold, neither investors would have been capable of providing support. Neither was it their intention to run a business fully. They are not experts in all segments in which they invest. They are excellent in financial subjects and also networking is a significant aspect where the investor can help, but day-to-day business and the strategic planning have to be managed by the company management. The investor will however carefully evaluate the proposals made by the portfolio company managers to ensure the analysis was carried out correctly and based on realistic assumptions.

Findings from the case of company “D”

The finance investors who are the majority shareholders of “D” support the company with regards to administrative and organisational matters. Due to their experience with SMEs they were able to give advice for various decisions. However when it came to technology strategy, the shareholders did not and were not able to intervene or to suggest the optimum direction. In the eyes of the shareholders, the areas in which they – and finance investors in general – can and should express their opinions are limited. Portfolio companies often

lack experience and know-how in general business practices. For technology strategy however, the expert panel has to be the company.

The outcome of the interviews summarised in brief

1. How often do investor and investee communicate?

→ The investors meet the portfolio company management personally once a quarter as a minimum. Regular “keep-in-touch” calls are scheduled on a monthly basis and further contact is arranged on request or demand (e.g. during budget time, financing issues, etc.).

2. Who (position/responsibility) communicates with whom (investor/investee)?

→ The asset managers from the finance investors take part in the personal meetings, sometimes supported by experts from their back office. All the board members from the portfolio company management join the meetings. Occasionally meetings with the CEO only may happen. The participants in “keep-in-touch” calls are the same as those for the personal meetings.

3. Which communication methods are used (e.g. email, phone, personal meeting)?

→ The most frequently used communication channel is the phone, but emails are also exchanged, mainly to submit specific data or documents. Personal meetings are scheduled roughly once a quarter.

4. Are reports made regularly? If yes, what is the rough content of the report (key figures, projects,...) and who prepares/receives it?

→ After the finance investors acquired “D” they requested some modifications to an already existing reporting system that had been put in place by the first holding to acquire “D” in 1992. Although the reporting system already included all the relevant financial figures, the investors requested a monthly update on the projects, the average efficiency of the production equipment and important news about customers and suppliers.

5. Do the asset managers specialise in specific sectors, markets and/or products? If yes, what is the reason/justification (experience, expertise, individual interest,...)?

→ The asset managers involved in “D” have good expertise and experience in the market of metal components, but not specifically in the ones that “D” manufactures, in other words, the markets that “D” serves. But they have a sense for metal products in general, as well as for the requisite investments.

6. When do investors involve or request 3rd party know-how and/or advice? Who is/can be the 3rd party (specific division of investor, independent consulting company,...)?

→ In the pre-investment phase, two independent 3rd party consultancies analysed the current financial and product portfolio situation, including the project pipeline. After the investment had been made, 3rd party advice was requested several times, when for example, a huge investment was about to be made, to support internal restructuring, etc.

7a. How much do investors care about the technology strategy of their portfolio companies?

→ Both parties commented that a finance investor has to be convinced that the manager(s) in place at the portfolio company know what they are doing. If an investor believes that they know how to manage the portfolio company better or which technology strategy would be best to select, the manager(s) would not and should not survive long term. This is why it often happens that the management is changed several times within a short period in companies which are in a very difficult situation or environment.

7b. If they do influence the technology strategy, on which basis do they do that (legitimation)?

→ In the case of “D” no direct influence was made, but a specific indirect influence did take place. New product and process technologies were developed resulting from the connections to new customers established through the finance investor’s network. The investor himself was never deeply involved

in direct action at the portfolio company or the customers, which is why it can be said that no influence was exerted.

7c. From where do the asset managers receive their information (business analyst?, ...)

→ Main sources of information are internal analysts, other asset managers and the professional network.

8. What is the link / relationship between marketing, organisation, finance strategy influence of an asset manager and technology strategy influence?

→ The strongest link is between the finance and the technology strategy. When the top priority is to save money or to run the company with the minimum of expenditure, investment in new technologies is not possible. Furthermore, a strong focus on current technologies that ends in all available specialists only having time for current technology products hinders investigations and progress into new technologies, that might be necessary in the long term. All depends on the horizons of the people who are driving the decisions. The impact on technology strategy is similar no matter whether organisational or marketing decisions are being made.

9. Which tools can/do investors use to measure/judge if the technology strategy of a portfolio company will guarantee success in mid to long-term?

→ The tools are simple business calculations. It is the responsibility of company management to ensure that the assumptions and the figures are realistic and achievable. In a well-presented business case, data from different sources are shown. The investor will simply ask a few questions to allow him to judge whether the approach is realistic and good or not. If there is any doubt, the back office of the investor will be involved or maybe a 3rd party.

10a. What opportunities do investors have to exert influence on their portfolio company's technology strategy?

→ An investor can give advice if they have a gut feeling about what is the right technology strategy. Furthermore, investors can ask a 3rd party to analyse the situation of a company and present that as a "you have to go in that direction" approach. Most probably this would end in a conflict with the company CEO, if

their thinking was totally different. Most CEOs are not financially dependent on an employer and will be strong willed.

10b. What are the mechanisms/dynamics of influence? Do managers hide information – if yes/no – why?

➔ In the case of “D”, cooperation and the relationship between the finance investors and the company management is very open. It is clear that the investors can give advice in certain administrative aspects, but at the same time it is also clear that the technology strategy as well as R&D in general is purely in the hands of company management.

10c. Are all the investors (and asset managers) the same or are there differences between them?

➔ Finance investors in most cases seek short-term returns and prefer investments that are short to medium term, stay in sight of a potential buyer and deliver good returns. Long-term returns are not first priority. In the case of “D”, the investors are seeking profit as well, no doubt. But their view is different. They are prepared to accept a lower return today, if they are convinced it will bring long-term results that are too distant for them to profit, but may profit a potential buyer of the portfolio company. They focus on small and medium size companies.

11. Is technology strategy indirectly influenced by e.g. budget decisions?

➔ The two main factors through which finance investors, as quasi outsiders, indirectly influence the direction and intensity of technology strategy are budget and investment decisions as well decisions in the area of HR. When an investor realises that something is going fundamentally wrong in a portfolio company, they might suggest a change in management. This may be to replace the CEO or other management team members. As different people have different preferences and experiences that influence their decisions, changes in the management very often result in a change in technology strategy as well.

12. Do investors act as consultants concerning technology strategy and organisational learning? If yes, what are the consequences and results?

→ Regarding organisational learning, the answer in the case of “D” is definitely yes, due to the extensive expertise of the asset managers in SME companies. The answer is no for technology strategy.

13. Are there cultural differences between different investors?

→ Differences according to geographical region do not really exist. Most investment companies think and act in quite similar ways. A few are more cooperative, like the ones engaged in the investment of “D”. Then there are others that act on the offensive and aggressively by blaming in public the company management of being unable to do their job properly.

The case of company “E”

Data collection

Analysis of the investor – portfolio company relationship of company “E” used both primary and secondary data. Secondary data was gained through the company websites, press releases, the company in-house magazine and articles in finance magazines. Primary data was gained through four personal interviews at top management level at the portfolio company and two interviews with the private equity investor. One with an asset manager and another one with a member of the portfolio team who supports the portfolio companies on request or when the investor believes it is helpful or/and necessary.

Company background information

The company “E” is the result of the diversification strategy of a leading nuclear energy company in the late 1980s. With the target of doing some business outside the nuclear energy field, it was decided to focus on something that is still related to energy. Finally it was decided to buy and merge different connector manufacturers worldwide to become a global player in that market with activities in different segments such as the automotive industry, telecommunication industry, consumer and industrial electronics. The companies that were merged into “E” had all existed for a few decades and had a good and stable portfolio with a large customer base. In 2005, the mother company decided to sell “E” to generate cash for another activity in their core area, the nuclear power business. The buyer was the private equity fund that still owns “E” today. From 1988 to now “E” has been constantly growing through acquisition and expansion. Today “E” employs around 13,000 people around the world with a turnover of 1.3 billion EUR and is one of the world’s market leaders. The manufacturing footprint of “E” is truly global. Currently 22 manufacturing sites and 13 R&D centres are spread across all continents, supplemented by additional sales and administrative offices.

The role of technology in company “E”

The products of “E” seem at first sight to be relatively simple as in most cases they are just made from one piece. In some rare cases a complex mechanism is included to reduce the mating forces on the connectors, to ensure that the connector cannot be unlocked, etc., but even then they don't seem to be very complicated. However, a look at the details changes the picture fundamentally. One fact that illustrates the innovativeness of “E” very well is the number of patents – which is currently above three thousand. The patents cover a lot of product details as well as processes, both in production in “E” s factories as well as in the factories of the customers. One area where “E” is more advanced than most of its competitors is the processing of their own components at the customers. As of today there are new projects with new technologies in the pipeline, such as crimping terminals in two steps with one tool, the crimping taking place in a heated atmosphere or welding instead of crimping.

These are all technologies that are not currently available on the market and they will definitely not be entering the market with significant coverage in short term because of the necessary investment required. As these technologies bring huge improvements to quality, it is possible that for some critical applications the implementation will happen rapidly after the testing phases have been concluded while for most of the standard applications the process change will happen over a period of 5 – 10 years. In “E”'s factories the stamping process will soon be implemented in a new technology. A few years ago it was revolutionary for two metal strips to be included in one stamping formed at 600rpm in a two-piece terminal that is laser welded. The next step currently under development is to have a two-out die that is fed with 4 metal strips. While the tooling cost will again be 50% higher, there is already a saving because the output is doubled and there is a significant saving because the doubled output from one tool still runs on one stamping machine.

Overall this results in a doubling of capacity for a cost multiplied by 1.2-1.4 depending on the tool design and machine type. The problematic thing is the

technology to build and fine tune the tools that have to be developed and then the skills required to use them have to be transferred to all people involved, including external suppliers and the maintenance and trouble shooting teams in case of interruptions. Something will brake or stick from time to time in tools with an incredible number of moving parts, even when preventive maintenance is done properly. For such an event, the loss during each hour of lost production is again incredible and very painful. This is also one reason why a few people at “E” would prefer to continue with the current technology. An excellent internal support unit for such activities is the corporate R&D centre based in France. The function of this R&D centre is to carry out advanced research and development for all divisions of “E”, independent of the application field. The staff are also involved in the optimisation of the plating processes for terminals or smart card chips – for which “E” is the world market leader – and which is required to reduce the cost intensive amount of precious metals that cannot be replaced.

It requires careful strategic planning to roll out the technology to keep and extend the large portfolio from the very simple tube terminal to the latest high-density connectors or smart card connectors. Without that, new and more efficient production technologies, for simple and mainly price driven products, may not be identified at the right time with the consequence of uncompetitive pricing. The same thing can happen with new technologies that offer better characteristics. The market can accept a higher price when the product offers a specific benefit or advantage in return. Such competitive advantages are key to being among the world’s market leaders. When such a position is achieved, it will not be lost immediately when technology strategy no longer has priority because of a change in priorities. However in the medium and long term it will hurt significantly. Currently the focus at “E” is on several hot topics that are creating huge difficulties and losses, such as manufacturing footprint, pricing, logistics, so that there is definitely a suspicion that “E” is losing track of its vision in the short and medium term against the main competitors due to heavy pressure to improve the EBITda.

Ownership structure

The company “E” was founded in the 1980s, through acquisition of several SMEs around the globe. It was formed by the M&A department of one of the largest European companies in the nuclear energy sector. All of the companies that formed “E” had been active in the field of electrical connections a long time before the acquisition took place. Most companies were founded in the mid 20th century. Finally in the mid 1990s the company had more than 10,000 employees and a turnover of more than 1 billion EUR. Around 15 years after the foundation of the company in 2005, it was sold to a private equity investor to free up cash for a large project in the core area. Since 2005 the ownership situation has been unchanged.

Interaction with investors

One of the first investor driven actions in 2005 – after the ownership change – was to do some fundamental restructuring that affected all sites worldwide. The decision was made to form four divisions under the umbrella of a corporate group with the aim of making each division more manageable and to allow more specialisation and focus in the respective areas. Another significant factor was to make more of the acquired companies. While the previous owner had several, partly global companies in one basket, the investor was pushing for filtration of all sites by segment, so that from one large company a group with 4 independent but still global acting companies, with leading positions in their specific area of activity would result. In 2009, one of the divisions that specialised in interurban connections was sold - the first positive return from the restructuring that had taken place a few years before.

It is quite probable that the remaining divisions of “E” will not be sold or prepared for an IPO as one package, but as separate and individual companies. The shareholder does not drive the sale of an individual division alone, it is decided in close cooperation with the corporate CEO and the corporate VPs of the divisions. When a good offer is made for a division, no matter whether by a

competitor, another investor, or whoever – the sale can go through immediately. If no interesting bid is put on the table, it can easily take several years until the current investor fully exits their investment in “E”.

In recent years it was common practice for investments to start before official approval had been given, e.g. when project timing was very tight. Many things even ran in parallel to the official process. These “submarine” schemes were often the key factor in success in comparison to competition. Nowadays no one is willing to take that risk anymore. Even for small investments, a very detailed proposal has to be written. Financial controllers fear having to answer difficult questions put by the shareholder, or, even worse, that it becomes evident that some aspects of the proposal have not been considered (e.g. complementary investments that are necessary for additional equipment). Key financial figures are the number one priority for the shareholder. If the top line is going down, as it was in 2008, immediate action is expected. Restructuring to slim down the cost base is a must. Whereas in the past lay off decisions were made also in consideration of experience and knowledge of the employees, the focus is now purely on cost savings (the higher the salary the bigger the effect...).

For sure, experience and knowledge are not fully ignored, but priorities have definitely shifted to the detriment of the performance profile of the company. Final approval for the budget, including all investment plans has to be made by the shareholder. It regularly happens that last minute adjustments are required. All spending on production equipment and R&D has to be fully in line with the product and market strategy that has been closely defined with the shareholders experts. In the case of “E”, the shareholder has his own consulting division that not only takes care of the portfolio companies, but also outsider clients. Apart from the consultancy, which is part of the finance investor group, other outsider consultancies are involved that are specifically experienced and skilled in the areas under analysis and improvement, such as re-pricing, regional marketing and product planning, etc. The whole way of working is much more in line with the existing and defined rules with the investor at the

back and everyone aware that big brother is watching. This is positive from a stringent process point of view, but at the same time it kills creativeness and entrepreneurial thinking.

Findings from the case of company “E”

In the case of “E”, the investor uses expertise in all kinds of straight and transversal analyses to support and double check the strategic initiatives of the portfolio company. On many occasions best practice solutions from other investments have been shared and implemented. Even totally different sectors inspire new thoughts and ideas. Third-party consultancies and portfolio team members from the finance investor sometimes act as moderators as they are outsiders and do not have the tunnel view that many employees have after several years in the same environment. Human resource decisions are also sometimes made on the basis of feedback and recommendations by these people, both for employee promotions and restructuring. Regular involvement of the top management of the investment firm is written into the contract for all investment decisions. The value after which an investor OK is mandatory is 50k EUR. However, smaller investments also need to be listed and submitted to the investor’s back office for information.

In fact, even little investments are questioned. The site controllers request information on all investments, even if for 1k EUR, plus a reasonable and transparent justification. Furthermore, all decisions with a significant influence on the product portfolio, market position, capacity adjustment; generally speaking anything that results in changes to the company parameters and specifics, has to be given a green light by the investor. Direct influence on technology strategy does not exist. This is not an area of expertise of the finance investor. However, involvement in market and investment decisions and strong pressure to improve the EBITda does move the focus away from technology strategy and as such is an indirect influence. Furthermore, potential influence on nominations for the top management team results in an indirect effect on the technology strategy.

The outcome of the interviews summarised in brief

1. How often do investor and investee communicate?

→ The meetings with the shareholder do not happen on a regular basis such as every 1st Monday of the month. Communication is much closer. Some people from the portfolio teams are permanent team members for selected projects. Furthermore, all investment decisions have to be approved by the shareholder. In many cases, it is enough to send an email with a rough description and in return the management team of the shareholder responds positively. On the other hand, when something is not very well-founded and fully backed-up, it can easily be rejected. Everyone is afraid of breaking the rules for investment approvals.

2. Who (position/responsibility) communicates with whom (investor/investee)?

→ Communication regarding company performance, approvals and strategy definition is purely on the level of the asset managers at the finance investor side and the CEO / division VP level of the portfolio company. For specific projects, people from the investor portfolio teams are involved on a daily basis. In some instances these people are almost temporary employees of the portfolio company.

3. Which communication methods are used (e.g. email, phone, personal meeting)?

→ The most commonly used method for communication is email as several exchanges take place in a week for which the involvement of more than one person from both the portfolio company and the investor side is required. Phone calls and phone conferences take place when detailed explanations are needed. Personal meetings are not scheduled on a regular basis, but they happen on average more than once a month.

4. Are reports made regularly? If yes, what is the rough content of the report (key figures, projects,...) and who prepares/receives it?

→ Yes, the reporting system is a very important tool that is readjusted from time to time, depending on the current focus. Since 2005, the content has mainly been growth, i.e. new business. In 2010 and 2011 it was restructuring (resulting

from logistical mismanagement) and re-pricing (due to the significant increases in raw material prices). All such projects have to be defined and then analysed. In parallel the reports also access a huge database of financial figures on the division, region and also at the plant level. The investor also asked for a consolidated excel file with all data on P/N and product line level in addition to a detailed power point presentation. The back office of the investor then carries out an internal analysis based on regularly updated data for which the results are reported back to the portfolio companies in the form of why-questions or requests for action.

5. Do the asset managers specialise in specific sectors, markets and/or products? If yes, what is the reason/justification (experience, expertise, individual interest,...)?

→ At the asset manager level, the expertise is usually in markets or is sector specific, there is rarely product and process knowledge. If by chance an asset manager is involved in an investment in which they have a personal interest, it can elevate them to a position where they are better able to judge the decisions of the company, but in most industrial investments that does not happen. When an asset manager is repeatedly involved in comparable investments, in time they will acquire corresponding expertise, but this is truly the exception. Large investments are not everyday business. Minor similarities between different investments are standard, but nothing more than that.

6. When do investors involve or request 3rd party know-how and/or advice? Who is/can be the 3rd party (specific division of investor, independent consulting company,...)?

→ In the case of “E”, 3rd party expertise has been requested on several occasions. The first was the pre-investment phase. Thereafter external consultancies have been involved several times for restructuring, pricing analysis, logistic concept analysis, technical benchmark analysis, etc. Some of these consultancies work on a global basis and even travel to different regions to carry out their analysis. For other specific actions where knowledge about, e.g. the law in a certain region has to be considered, local companies are

chosen. Similarly, when offices or manufacturing sites are set up in a country in which “E” has had no previous activity, then consultancies are called in.

7a. How much do investors care about the technology strategy of their portfolio companies?

→ The technology strategy of “E” is important for the value of the company. For the investor it is clear that they are not going to be keeping “E” in the portfolio long term. At the same time however, it is clear that when an IPO or sale of “E” takes place, technology and technology strategy will be areas of interest for all potential buyers. Thus some investment in that area is necessary. In the high power segment for electrical vehicles, for example, “E” has a minimum portfolio which has brought in good business already. However, further investment would be necessary for expansion into other OEMs. But such investment is currently not approved, because the returns would take a few years to come in and in the event of a sale it would be possible to construct a story-line that the current portfolio does fit to other OEMs with or without minor modifications. Also, selection of the technology to invest in is dependent on the expected fit to potential buyers in the area of competition, customers, etc. Currently no proposed investment or new project has been approved for business lines in “E” that do not correlate to a prospective buyer.

7b. If they do influence the technology strategy, on which basis do they do that (legitimation)?

→ What happens with many investments is that an analysis is carried out into which other companies in the same area would be interested in buying the portfolio company. The results of the analysis often show that certain business lines do not fit the portfolio of potential buyers. Then a decision has to be taken. Can the business line that does not fit be separated, or, if separation is not possible, due to size (too small), how it can be “shut down” or maintained with a minimum of investment. It is in the investor’s best interests to push and improve interesting and promising products and technologies and invest all the cash that can be made available for R&D in these fields. With the market value of the company in mind, the investors definitely do influence technology strategy

decisions – not directly based on superior expertise, but driven by product lines and market attractiveness.

7c. From where do the asset managers receive their information (business analyst?, ...)

➔ Apart from third-party consultancies, the back office people and portfolio teams are the dominant sources of information for the investors involved in “E”. In general the investor does not know better than the portfolio company management, but in some details the involvement of an analyst or advice from someone with an outside view is helpful. The portfolio team member who was interviewed talked about one case where one of the biggest European canteen food suppliers had already made very detailed plans about how to expand into certain areas. The business plan had been completed and reviewed by the back office people at the investor’s. Following a deep-dive analysis, the question came up as to whether the portfolio company would be able to support growth like this with the existing logistics concept and flow of goods. Suddenly the response was that they had not looked at this so far, but they assumed it would not be a problem. After analysing a huge Excel file, it was clear that the current logistic concept was not at all capable of supporting expansion and it would quickly collapse - with negative consequences for the end customers. Luckily this was discovered early enough to react. The strange thing is that it was not the experts at the portfolio firm who identified this gap, but an outsider analyst.

8. What is the link / relationship between marketing, organisation, finance strategy influence of an asset manager and technology strategy influence?

➔ Technology strategy is directly affected by finance strategy. In the case of “E”, it was evident that all spending and investment is minimised to keep the existing business running and to maintain some projects in the R&D pipeline. The focus is not on the long term. Consequently, technology strategy is influenced by marketing and organisation. If an organisation does not have the necessary resources or know-how, it can be impossible to move in a certain direction. Ensuring the vital ingredients are available is a basic condition. Similarly the direction of product marketing influences or in some cases even dictates the direction of the technology strategy.

9. Which tools can/do investors use to measure/judge if the technology strategy of a portfolio company will guarantee success in mid to long-term?

→ The investor analyses a business case that has been prepared by the company management on the basis of various assumptions and known parameters, maybe with the involvement of external experts. The return on investment and the timeframe for the returns is crucial. Anything that in the short term does not bring a good return or increase the value of the company is likely to be rejected by the shareholder. The ROI expectation is on average much higher for the finance investors than the private owners.

10a. What opportunities do investors have to exert influence on their portfolio company's technology strategy?

→ Finance investors can – especially when they are the major shareholders – put pressure on the management for anything. Even minority shareholders do this sometimes, but few companies do actually do this systematically. In fact the decisive factor for such behaviour is generally the personalities of individual people, not the general policy of a company. The culprits are generally known anyway as their letters will have been written to news agencies.

10b. What are the mechanisms/dynamics of influence? Do managers hide information – if yes/no – why?

→ In the case of “E” several first and second line managers have had to leave the company over the past few years as a result of management failure. Today everyone is extremely nervous about doing anything wrong, but recognises that to hide anything could create a problem later on, for which they must accept responsibility. However some minor cosmetic corrections are standard and in each management line people try to organise their team with maximum responsibility for the people in the next line below, so that it is clear who has to leave in the event of significant failure.

10c. Are all investors (and asset managers) the same or are there differences between them?

→ The asset managers are different to the extent that other managers or each of us as an individual is different. Their personality and their previous

experience are the main drivers for their behaviour and actions. The targets are mostly the same – to generate increased company value and short-term cash returns, only the way to reach these targets differs depending on the factors mentioned before. A limitation on the targets for investment was not reported, but a willingness to eradicate the business was reported – which ultimately did happen.

11. Is technology strategy indirectly influenced by e.g. budget decisions?

→ Yes, definitely. Targeted markets and products as well as the manufacturing footprint play a major role. When a business case promises only long-term returns, the go-ahead to invest might not be given. The important question is whether the investment would increase the company value in the event of a sale or IPO, even if returns from the investment would not positively impact the finance investor or new company shareholders in the short-term.

12. Do investors act as consultants concerning technology strategy and organisational learning? If yes, what are the consequences and results?

→ Regarding technology strategy, the finance investor was and is unable to give any direct input into “E”. The situation is different for organisational learning in general. In the areas of reporting, analysis and management accounting “E” has brought internal business excellence up to a level far above what it had been before the finance investor became involved. On the one hand this is because the company was learning from the investor and the contracted 3rd party expertise. On the other hand, many regulations and processes have been in existence for a long time, but have not been followed with dedication because it was often easier not to do so. Now, with the finance investor involved, failure or neglect of existing processes and procedures can have much more severe consequences, so that people are still not especially eager to follow the regulations, but are afraid of the negative impact if they act according to gut feeling. The sad part of this is that the entrepreneurial thinking and acting that sometimes helps a company to react quickly by bypassing some rules has evaporated. The first maxim is to follow the internal rules and guidelines and safeguard your own job.

13. Are there cultural differences between different investors?

→ The main difference in investors is their investment size. Smaller investors often act in a more cooperative manner including personal relationships. Large investors function without personal relationships, in a much more anonymous style.

The case of company “F”

Data collection

Analysis of the investor – portfolio company relationship of company “F” used both primary and secondary data. Secondary data was gained through the company websites, press releases and articles in magazines. Primary data was gained through two personal interviews at top management level at the portfolio company, one interview with the private equity investor who has been involved since 2000 and one interview with the investment bank.

Company background information

“F” was founded in the mid 19th century in northern Germany to produce metal fittings and locking mechanisms. The original customer base consisted of coach makers, the construction industry and later on vehicle manufacturers, following the introduction of motorised vehicles. Due to rapid growth of the company in the first few decades following foundation, a new production area with more than 50,000m² of production floor was built, to which the company moved before the beginning of the 20th century. From the mid 20th century on, “F” streamlined its portfolio in order to concentrate on products for the motorised vehicle market only. The products were used by all European carmakers and from the 1970s on, also by some of America’s global carmakers. Due to the long lasting and very cooperative relationship, “F” was in most cases the only supplier for locking systems. This position as single source guaranteed a stable business over a long time, as the parts were very often carried over without modification into new platforms.

Furthermore it was relatively easy for “F” to bring new products onto the market, if there was an improvement in price or functionality, as the trust and know-how that a newcomer needs to build before they are rewarded with the first few orders in the automotive market was already established and well-

acknowledged by the prominent customer base. In the 1970s, “F” acquired an innovative start up company that was about to gain a market share in the segment of automotive latches. With this new acquisition and the existing know-how, the first central locking system for passenger cars was developed and successfully launched on the market. At the beginning of the 1980s, the position of CEO for the first time ever was taken over by someone outside of the founder’s family, while still being 100% owned by the founder’s family. Later in the 1980s, this CEO founded a finance investment company and bought up all the founder’s family shares in order to prepare “F” for the initial public offering. It took several years to settle, but in 1995 “F”’s shares were finally traded on the stock market. In the 1990s the manufacturing footprint was adjusted in line with growing demands from North American OEMs and American transplants of European OEMs.

Two plants were built in the United States of America plus one in Mexico during that time, mainly to serve the activities of the German carmaker Volkswagen. From 2005 to 2010 “F” was grounding its activities in China with a joint venture partner. From 2011 on, “F” has been acting independently in China in order to take full advantage of the growth that is expected for both non-Chinese and Chinese OEMs. Five years after “F” went public, the dominant portion of the shares was acquired by a private equity fund. “F” experienced another major ownership change in 2006 due to the model used to finance the acquisition. The shares acquired by the private equity fund in the year 2000 were transferred into the portfolios of two hedge funds and one investment bank. Today “F” is still in the ownership of this finance investor consortium and last but not least, because of the current boom in the automotive market, is in good shape financially. In 2010 “F” achieved a turnover of slightly above 500 million EUR with 4,300 employees around the globe. Proof for the innovativeness of the company is the large number of 800 patents owned by “F”.

The role of technology in “F”

“F” started business by making relatively simple metal fittings and basic locking systems for doors, shutters and coaches. With the advent of the growing demand for motorised vehicles, “F” experienced a similar but stronger growth in products. The main reason why the growth was so strong for “F” was simply the growing complexity and number of locking mechanisms used per vehicle. The first vehicles without a roof were only equipped with a locking system for the engine compartment. With increasing comfort and the hard top as a standard, doors became standard as well – including the locking systems. The requirements for locking systems were steadily being set higher to keep pace with other components in vehicles. The effect was twofold: Firstly, the tolerances had to become much narrower, making application of the latest available production technology absolutely necessary. Secondly, the market expected new materials and innovations to reduce the number of parts in parallel with improved reliability. Nowadays the major projects are in the area of electronics, such as electrically controlled locking systems for passenger cars.

The alarm system, the interior, lights, the double locking function and other comfort features are today controlled by a number of micro switches. The reduction of the number of elements in a locking system usually automatically produces a cost reduction. The housing that used to consist of two shells is today an overmoulded stamping grid that often already contains the nuts and bolts. Instead of going through standard wires, the electrical connection is created in the stamping grid. The connector is integrated in most cases. A dilemma is sometimes posed by the need for vehicle specific solutions on the one hand and the requirement for standardisation and variant reduction on the other. Regarding the switching function, the latest technology offered exclusively by “F”, is the use of Hall sensors instead of micro switches. The cost per module is higher, but the reliability is better. In a micro switch, particles from the plastic parts cannot be eliminated completely.

By definition there is a failure rate of 2-3 parts per million because of such particles. Multiplied by 8 switches per locking system that is already too much risk for some customers. Selection of the right sensor elements and the necessary capacitors, as well as definition of the right process parameters took a long time and was quite costly. Nevertheless the investment is bringing a good return because at this moment in time exclusively “F” offers it and it is the only solution accepted by one of the top 3 German OEMs. New products and technologies are pretty much driven by the requirement for more comfort or new applications. For electrical vehicles, for example, it is a legal requirement that the charge plug is locked during active re-charging of the batteries.

Permanent monitoring of the market trends and OEM requirements as well as the internal R&D activities to develop new products are key for “F” to maintain and in the best case improve its current market position. For electrically controlled locking systems, “F” has to invest more in innovative solutions, as today it is no longer allowed by European law to eliminate all the mechanical options for opening the doors. This is mainly due to safety considerations in the event of an emergency. This and other trends have to be followed closely to ensure that the market share is secure for the future.

Ownership structure

Since foundation to the beginning of the 1980s, the company was owned by the founder’s family and also managed by the founder’s family. Due to growing debts, resulting from huge investment in capacity expansion and strong price pressure from the customers, driven by competitors who wanted to break a monopoly, a CEO outside of the founder’s family was nominated in 1982 for the first time. Five years later this CEO started a finance investment company and bought all the founder’s family shares in “F”. He started some reorganisation activities and streamlined the administrative part of the company in order to prepare for an IPO. It took several years until all those activities were completed, but finally in 1995 “F” went public. For more than five years a major portion of the shares remained in the ownership of the CEO’s investment

company. In 2000 a fundamental ownership change took place. More than 90% of the shares were acquired by a private equity fund. Unfortunately the model used to finance “F” which involved large debts – with the plan that “F” should pay back the debts and the interest – did not work. In 2007 the private equity investor sold his shares for a symbolic amount to a consortium of two hedge funds and one investment bank. Today ownership is still in this configuration and the founder’s family no longer has a significant portion of shares.

Interaction with investors

After the IPO in 1995 until 2000, there was no significant interaction with the finance investor who owned the majority of the shares, as the CEO of the investment company was also the CEO of “F”. The situation changed at the beginning of the 21st century when the majority of “F”’s shares were sold to a private equity investor. The CEO who had been with “F” for a few decades, until acquisition by the finance investor, was similarly knowledgeable and involved in different projects and schemes at “F”, as had been the case with the founder. Shortly after the ownership change, some management changes did occur. As a consequence of the ownership change, personal contact between the owner and people from different hierarchy levels at “F” was cut. The representatives of the private equity company simply met with the CEO and the other board members. Exchanges by phone and email were quite frequent – on average weekly. Regular personal meetings were not planned, but happen on average once a month.

The attendees from investor side were always only the asset managers, without support from their back office team. A few days after the monthly report was issued (reports had to be prepared by “F” according to a list of important KPIs defined by the investor team), a phone conference was usually scheduled for a question and answer session to which people from the back office team of the investor were also invited. As a matter of fact, the most important KPIs were the financial figures and it was vital to be able to explain all deviations from the budget which had to be approved by the majority shareholder.

For significant decisions regarding products, manufacturing and markets, the asset managers requested that “F” purchased external expertise from renowned consultancies or scientific institutes. Driven by the investor input, the new reporting system was not only a better guide for the investor as an excellent information tool, but also for the company management. Previously, the reports were far less structured and the number of defined KPIs fewer and subsequently less specific.

There was no direct interest on the part of the investor in technology or technology strategy. Similarly, the investor never tried to influence the technology strategy, as the team of experts available to support the portfolio companies had no specific expertise in the areas that are fundamental to the business of “F”. The investor asked to be informed about all investments above 5k EUR in the form of a monthly file detailing these investments. Crosschecking of the file took place at the finance investor’s back office. For investment decisions above 50k EUR, the investor wanted to be directly involved. Without satisfactory justification, most investments were initially rejected, with two consequences. Firstly, the number of investments that reached the investor went down, as some investments were considered untenable or unjustifiable in front of the investor. And secondly, the quality of internal investment requests was improving enormously in the description of the investment object, necessity and benefit. A quick decision at management level, which had been standard before the involvement of the majority investor was not possible anymore. This helped to reduce annual expenditure of “F” to a 7-digit Euro figure. In some cases however, it also created huge roadblocks.

Particularly for projects with very tight timelines, it caused a lot of friction, extra cost and accelerated the realisation time of different investments to recover the time that had been lost in preparing the data for presentation to get the approval first internally and in then secondly from the shareholder. With the transfer of the majority ownership to the consortium of two hedge funds and one investment bank, the situation changed again for “F”. One of the first actions of

the new consortium was the decision to make a fundamental change to the organisation of “F”. They created the position of a chief restructuring officer who reported both to the CEO and the investors. Employment of a full-time chief restructuring officer was expected to deliver quicker results and guarantee more accountability. The top priority of the CRO was to support a turnaround in the company with the focus on the short to medium term financial result. Again this was not supportive of the technology strategy, because the focus was on improving and stabilising the current business situation. There is no question that such prioritisation is vital to safeguard a company and the workplaces of people. On the other hand it can have long-term side effects because of financial results that are below expectation, but still not bad compared to other benchmark companies. In the configuration with the hedge funds and the investment bank, investor control again increased. Regular monthly meetings were put in place to track the projects that had been kicked off in order to achieve the forecast financial results. Decisions about corrective action when the status deviated negatively from the project plan were also made during these meetings.

Findings from the case of company “F”

In the case of company “F”, where different investors have been involved during the last decade, it is evident that no direct influence on technology strategy was exerted by any of the investors. But this is not to say that the technology strategy was not influenced at all. The actions that were taken and driven by the investors clearly have had an influence on the technology strategy, but not in a direct way and not due to the fact that the investors know any better than the company management what the right direction to take is. The investors were actively involved in the decision making process based on company performance. Investment approval can have a direct effect on technology strategy, even though the decision made by the investors is not made because of their expertise in the area, but because of the overall business case prepared by the portfolio company. The company management has to make sure that a business case is prepared and presented properly. Failure by the CEO’s team

to produce a good business case can result in a negative response from the major shareholder. But not because the shareholder knows the technology chosen is not the right one. The effects on the organisation of “F” were quite significant, not only, but also due to the installation of a chief restructuring officer. This is the only case study from the six in which such action was taken by an investor.

The outcome of the interviews summarised in brief

1. How often do investor and investee communicate?

→ In the period where one private equity firm was the majority shareholder, the average frequency of communication was a bi-weekly “keep-in-touch” call and a bi-monthly personal meeting to review the actual situation in detail. Extra calls and emails were exchanged if required by the current investor project or when the company CEO wanted to have the investor in the loop. Looking back, the people interviewed reported that if they did not count the extraordinary calls then weekly contact was normal. When the investor consortium took over ownership of “F”, contact was much closer, but mainly between the chief restructuring officer and the investor committee. They had weekly “keep-in-touch” calls and monthly personal meetings and when, e.g. the chief restructuring officer was visiting subsidiaries abroad or attending customer and supplier meetings there was a close contact to hand who could drive short notice decisions.

2. Who (position/responsibility) communicates with whom (investor/investee)?

→ The instances of contact between the portfolio company and the investors were always between the asset managers from the investor side and the CEO plus in most cases the board members from the portfolio company’s side. When the chief restructuring officer was installed, he reported to both the company CEO and the investor committee. People from the investor portfolio teams were deeply involved in the analysis of data and strongly supported the work of the chief restructuring officer. Personal meetings did not take place, although

sometimes the analysts visited “F” to request specific data and information needed for their analysis.

3. Which communication methods are used (e.g. email, phone, personal meeting)?

→ The normal method of communication is email for the investor – investee relationship for when the investor needs information or when involvement of more than one person from investor side is necessary for a specific reason. Secondary to this are the regular “keep-in-touch” calls - as calls to drive quick decisions (mainly after the chief restructuring officer was activated). In terms of frequency, the personal meeting was the least dominant channel for exchange, but actually the one with the greatest importance. During personal meetings it is important that in addition to the pure fact and figures, a personal relationship is established. This is reportedly not a priority for the investor representatives, but for the company representatives it is enormously advantageous when a certain level of trust and confidence in each other has been established.

4. Are reports made regularly? If yes, what is the rough content of the report (key figures, projects,...) and who prepares/receives it?

→ During all the time of the investor involvement, reports were submitted on a monthly basis. They included several KPIs from finance, logistics, production, sales and quality. The structure was a few pages of management summary, but with a very much more detailed back up. Normally the back up was studied and analysed by the investor portfolio teams and analysts who would then report any inconsistency or obstacle to the asset managers in charge. Specific questions on the report were normally addressed during the “keep-in-touch” calls and personal meetings, depending on whichever was next after submission of the report. From the portfolio company view, reports are a very important and critical tool. It is dangerous to think that the report data and information can be manipulated or that specific things hidden. For sure there are certain degrees of freedom, which will be discussed later, but it must be always clear to the people who have to defend and explain the reports that they must be coherent and reasoned. Otherwise a fundamental breach of trust could result with severe and immediate consequences.

5. Do the asset managers specialise in specific sectors, markets and/or products? If yes, what is the reason/justification (experience, expertise, individual interest,...)?

→ The investor representatives involved in the case of “F” were not specialists in the specific business area of “F”. This does not however mean that they did not have a clue about the business. Most of the asset managers involved do have extensive knowledge of and experience in the automotive industry due to previous investments. In some respects that makes cooperation easier because the standard industry business practices and finance modes, e.g. for project specific investments, etc. will be known. The asset managers did not have any specialist knowledge regarding the products and processes and were not involved in compiling the information for decisions that was prepared by the company management including all the background information and assumptions.

6. When do investors involve or request 3rd party know-how and/or advice? Who is/can be the 3rd party (specific division of investor, independent consulting company,...)?

→ Before all the ownership changes in the last decade external third-party expertise was brought in for almost all investments in the pre-investment phase. Cooperation between the portfolio teams of the investors and the consultancies is of significant importance, as responsibility for the investment decisions has ultimately to be made by the investment company. It is extremely difficult to make the third-party accountable for incorrect information, so external consultants can be important advisers, but nothing more. Once investors were involved in “F”, third-party expertise was sought for all significant decisions linked with large investments, such as product diversification, change of local footprint and capacity extension. In most cases the investor would recommend a consultancy for a specific project, either from personal experience or recommendations from their professional network. One of the most extreme forms of consultancy was the implementation of a chief restructuring officer. A person who is part of the portfolio company, but doing a job that in most investment cases is usually done by an outsider consultancy.

7a. How much do investors care about the technology strategy of their portfolio companies?

→ In the case of “F”, technology strategy was not an area of direct involvement for the shareholders. It was a topic before the acquisition, as the technology strategy and the corresponding project pipeline are important for the company value in both in the short, medium and long term. After the investment had been made, the focus was clearly on other areas and the shareholder critically checked all investments in technology strategy to avoid spending money without a benefit for himself in the short or medium term and also to ensure that the expenditure was adequate. Financing a playground for engineers with visions that in 50% of the cases do not match market demand and customer expectations is not the intention of the finance investors. That does not mean that the shareholders will not support a good business case involving new technology in a product or process, but it must have a 95% chance of success to be of interest.

7b. If they do influence the technology strategy, on which basis do they do that (legitimation)?

→ In the case of “F”, the finance investors involved in the investment did not influence technology strategy directly with their own expertise. The investors set financial targets and approve certain budgets. The rest is more or less the responsibility of the company management.

7c. From where do the asset managers receive their information (business analyst?, ...)

→ The investors’ main sources of advice are the internal back office consultants, the company internal and external networks and third-party consultants.

8. What is the link / relationship between marketing, organisation, finance strategy influence of an asset manager and technology strategy influence?

→ In the case of “F”, significant changes in the organisation were initiated and partly driven through by the investors. The changes mainly involved finance and organisation, but not directly the technology strategy. But for sure, a streamlined

budget and a streamlined organisation affects technology strategy as well when day-to-day business and hot topics are considered a priority. In consequence, strategic topics lose importance, and the result may be a dry project pipeline in the medium term and a loss of competencies and competitiveness in the long term.

9. Which tools can/do investors use to measure/judge if the technology strategy of a portfolio company will guarantee success in mid to long-term?

→ It is standard for the portfolio company management to prepare the business cases for review and approval by the investors. The project status is reported regularly. In case of deviations from the plan, a bridge may need to be built by the company management to explain the discrepancy. The investor's evaluation is a helicopter view based on the input prepared by the portfolio company, which is then double-checked by the portfolio team.

10a. What opportunities do investors have to exert influence on their portfolio company's technology strategy?

→ If a majority investor had a technology strategy in mind that they would like the portfolio company to follow, the company would have to follow that strategy. What happens from time to time is that an investor forces a change in the company top management to put in position a renowned expert in a certain area, but this usually happens for specific markets or sectors, but not for technology. In the case of "F" however, the investor would not do this because he has nothing to do with the technology strategy at all.

10b. What are the mechanisms/dynamics of influence? Do managers hide information – if yes/no – why?

→ The business case drives the decisions of the investor. The company management has certain options to adjust the outcome. It is clear to the investor that some parameters may be fine-tuned to reach, e.g. a requested margin, and it is equally clear to the CEO that he can do the same within limits. The portfolio company management can then be held accountable if the business case does not deliver the promised results. When it becomes obvious that some parameters, e.g. pricing, were not realistic at the time when

the business case was prepared, then investor will react accordingly by launching changes through the human resource department.

10c. Are all the investors (and asset managers) the same or are there differences between them?

→ For “F”, the consortium of the two hedge funds and the investment bank was more strongly and more directly involved than was the case with the previous private equity investor. Employment of a chief restructuring officer was a significant intervention initiated by the investors. For all the investors involved in “F” there were no restrictions regarding the acquisition of potential companies. “Each deal can be of interest, depending on the frame parameters”, an asset manager said during an interview. The investor was also open to dismantling the company in order to maximise profit.

11. Is technology strategy indirectly influenced by e.g. budget decisions?

→ The only answer here is yes. Technology strategy is strongly influenced by decisions regarding budget, organisation, market and in respect of strategic customers.

12. Do investors act as consultants concerning technology strategy and organisational learning? If yes, what are the consequences and results?

→ The effects on the organisation were the standard changes you see when the majority ownership is transferred to a finance investor. In some respects the changes are dictated and driven directly by the asset managers on the basis of their expertise and experience. But to some degree at least, the changes originate from and are supported by external consultants who are involved at the request of the investors.

13. Are there cultural differences between different investors?

→ Most investment companies act globally and asset managers sometimes work on different continents at the same time. Thus cultural differences cannot be significant. Another reason why behaviour and actions are quite similar is the fact that through fluctuation and employment at different companies, asset managers are likely to have a good mix of experience.

The case of company “G”

Data collection

Analysis of the investor – portfolio company relationship of company “G” was based on secondary data gained from studying the company website, press releases and a personal interviews with a board member of the portfolio company. From the investor side, one asset manager who had been involved in the 2011 investment was interviewed.

Company background information

“G” was founded in 1956 in southern Bavaria by one of the world’s leading manufacturers of plastics as the first plant for the production of monofilaments and tapes. In the late 1960s, the manufacturing footprint was extended to the United States of America and at the beginning of the 1990s to Japan with involvement of a Japanese partner company. Whereas in the late 1990s the Japanese partner company took over 100% of the shares of the Japanese business, the German and American activities were sold to a US based company, but only for a period of 2 years. In 2001, both the German and the US location were also sold to the former Japanese partner as well.

In this configuration “G” was part of the Japanese group until 2009. In 2010, the Japanese group sold the German activities to a German based finance investor. The name “G” was given to the company only after this last ownership change and covers only the German facility. In figures, this means a manufacturing plant with administrative staff and a total number of employees of about 250. The annual turnover generated is around 40 million EUR. With over 60 patents owned by “G” and a new product line in the tape sector just launched last year, the perspective for further growth is good.

The role of technology in company “G”

Technology plays a major role at “G” both in the product and process areas. When the plant was founded in the 1950s, the products were revolutionary and one could argue that they have not moved on. However, look at the details and a totally different picture appears. The tolerances, the variation of diameters, the shape and other parameters are today controlled with a precision that was technically impossible one decade ago, but is in line with today’s technological innovations in the area of production,. Also the materials used today open the door to a variety of applications that were not considered in the early years of “G”. High performance rope, lightweight automotive applications and all kinds of fibre composites are typical areas where the products made by “G” are used. If “G” did not closely follow technological developments and innovations in those areas, it would lose its market position very quickly. Most probably the survival of the company would be endangered, because for products of that kind, state of art performance is mandatory. There is no market for products with a slightly cheaper price and worse performance.

Ownership structure

From the 1950s until 2009, “G” was owned by a series of different globally active groups with a focus on resin and plastic products. In 2010 “G” was sold as a stand-alone division to a finance investor who typically invested in small to medium size enterprises. There were no free-floating shares, but it was a 100% sale to the investor.

Interaction with investors

The investor’s aim was to turn the former division of a globally active group into an independent company that could survive by itself in the market or attract the interest of other investors in the short to medium term. The intention is to sell “G” within the next 3-5 years at the latest. One of the first actions taken was to install a new general manager with experience in restructuring and process definition. The investor team does not involve themselves actively in day-to-day

business, however it has requested very detailed and frequent reports. Having defined the extent to which the general manager is free to make decisions, weekly personal meetings are considered vital by the investment team to be informed about the actual status of orders and projects. A fear is that the previous owner of “G” will try to ship all orders from existing customers to other manufacturing sites outside Germany. This would quickly put the whole business of “G” at risk. If such a trend is observed, the investor team would like to know immediately which customers are concerned and what the potential impact would be in order to be able to take immediate countermeasures.

Findings from the case of company “G”

In the case of “G”, contact between the finance investor and the company management is very close. The company management has a clearly defined area of freedom in which they can act and react immediately. This includes both process and investment decisions. However, the investor team expects a weekly meeting with the general manager who gives an overview of the previous week’s events and which generally lasts about 1 hour. Technology strategy is not an area in which the investors are actively involved. They are confident that “G” has a good and reliable product portfolio and good equipment and processes. If new customer relationships can be built or existing relationships tightened by adjusting the technology roadmap to specific customer needs, the investor team is open to that, as long as the financial risk is manageable and the potential business case looks rosy and is in line with the target either to make the company fit for standalone survival or acquisition by another group company. The investor team has extensive expertise in turnaround management and is able to analyse and interpret data and figures very quickly. So the focus during each meeting is the presentation, analysis and interpretation of figures, followed by a discussion and definition of actions to control the financial figures and influence them in a way that the targets are achieved with regards to profit, etc. Technology and technology strategy are not a primary issue.

The outcome of the interviews summarised in brief

1. How often do investor and investee communicate?

→ Weekly personal meetings take place with participation of the investor team and the company general manager, sometimes supported by his first line reports.

2. Who (position/responsibility) communicates with whom (investor/investee)?

→ The normal channel of communication is between the asset manager and the portfolio company general manager. Other people are not usually involved in the communication.

3. Which communication methods are used (e.g. email, phone, personal meeting)?

→ The tool for immediate communication is phone and email, but the dominant method in the case of “G” is the personal meeting.

4. Are reports made regularly? If yes, what is the rough content of the report (key figures, projects,...) and who prepares/receives it?

→ The weekly report includes the book to bill ratio, sales, quality issues, important new business wins and achievements or drawbacks within the organisation. The general manager prepares the report aided by his first line team and the financial controller.

5. Do the asset managers specialise in specific sectors, markets and/or products? If yes, what is the reason/justification (experience, expertise, individual interest,...)?

→ The finance investor involved in the case of “G” is a specialist in small and medium enterprises, the typical German “Mittelstand”, but works independently of sector or the products. If an investment is interesting to them the main parameters are size and current situation.

6. When do investors involve or request 3rd party know-how and/or advice? Who is/can be the 3rd party (specific division of investor, independent consulting company,...)?

→ In the case of “G”, third-party expertise was only acquired to support the development and adjustment of the organisation, e.g. outsiders to moderate workshops with team leaders from different departments. No external consultants were involved in the product, process or market strategy.

7a. How much do investors care about the technology strategy of their portfolio companies?

→ In “G”’s current situation, technology strategy is a secondary area as this influences and affects the long-term survival, however it is monitored by the investor. “G”’s focus at the moment and in the near future will be to secure their current position and do some fine-tuning.

7b. If they influence the technology strategy, on which basis do they do that (legitimation)?

→ The finance investor exerts no influence on technology strategy.

7c. From where do the asset managers receive their information (business analyst?, ...)

→ The investment company that owns “G” is relatively small and thus has only a small back office team. Thus the asset managers collect most information from their network and public domain sources.

8. What is the link / relationship between marketing, organisation, finance strategy influence of an asset manager and technology strategy influence?

→ Technology strategy is a field of high importance for the long-term situation of a business. However a finance investor perceives this more as the cream on the cake, more important is the current situation and the short-term outlook as these can be proven and explained with real data. Due to the strong dependency of technology on budget, human resources and market strategy, changes in all these areas indirectly impact technology strategy.

9. Which tools can/do investors use to measure/judge if the technology strategy of a portfolio company will guarantee success in mid to long-term?

→ If a business case sounds realistic and interesting in terms of ROI, the investor will normally support it. No specific tools are used to evaluate the likelihood of success.

10a. What opportunities do investors have to exert influence on their portfolio company's technology strategy?

→ Theoretically an investor who owns 100% of the shares of a business can give any kind of direction to the CEO or general manager. The preferred option is to exchange opinions during personal meetings and to decide together what is the best strategy and approach. To dictate too many things to the portfolio company management can result in frustration and de-motivation. In the worst case, the company management would quit their jobs.

10b. What are the mechanisms/dynamics of influence? Do managers hide information – if yes/no – why?

→ An open dialog is key to a successful investor / company management relationship. How the general manager presents data and situations and the information they share influences the reaction and position of the investor committee. It is common practice that preparation for the meeting and the argumentation will support a certain direction of action. This is not a problem as long as both parties are open to neutral dialog. Otherwise the cooperation will not work.

10c. Are all the investors (and asset managers) the same or are there differences between them?

→ Investors have different focuses. It may be company size that is the dominant factor for them, the competitive situation or simply the sectors and market in which a portfolio company is active. At the end of the day, the top priority for all is to increase the portfolio company value, because this is from where they get their salaries. A specialisation, especially regarding the company size definitely does exist, not only, but also, due to the different sizes

of the cash pools that are available. Specific strategies such as buy-build-bust are not followed.

11. Is technology strategy indirectly influenced by e.g. budget decisions?

→ Investment and budget decisions are the key drivers for any project, because without a budget, no human or other resources are available. Limitation of the available resources results in a limitation to the outcome. In other words, yes, the technology strategy is definitely influenced by the involvement of investors in the investment and budget approval processes.

12. Do investors act as consultants concerning technology strategy and organisational learning? If yes, what are the consequences and results?

→ A clear yes for the organisation and the general operational excellence, but a clear no for technology strategy.

13. Are there cultural differences between different investors?

→ Some follow a very cooperative approach and consider the portfolio company management to be an equal member of the team. However there are others who have a clear vision of what the figures should look like and consider the CEO or general manager to be a well-paid tool to carry out their orders.

The case of company “H”

Data collection

Analysis of the investor – portfolio company relationship of company “H” used both primary and secondary data. Secondary data was gained through the study of company websites, press releases and articles in specialist magazines. Primary data was gained through two personal interviews at top management level at the portfolio company and one interview with the private equity investor.

Company background information

The company “H” was founded in the mid 20th century in Bavaria/Germany to produce injection moulded and extrusion blow moulded parts for the pharmaceutical industry, the white goods and automotive industries. In the 1980s and 90s business activity was increased by doubling the production capacity in the original plant plus two acquisitions in Germany. In the early 21st century, two more plants were opened both outside Germany. One in Poland to serve mainly European customers and another one in the USA to reinforce the position in the NA region. The dominant portion of the products sold goes to the automotive business. Automotive is also the area where the biggest growth is possible and where activities are focused. Today “H” generates a turnover of more than 100 million. EUR. In 2011 the target was 110 million EUR. The number of employees in all plants totals to something around 600.

The role of technology in company “H”

The products of “H” are very complex in design and material. Thus R&D as well as the production processes are the most important factors behind success in the market.

Ownership structure

After being a privately owned company for more than 50 years, in 2008 “H” was sold to an Indian industry group company before being re-sold in 2009 to a finance investment company which today (2011) has 100% ownership. Due to negative financial results, the main target of the finance investor is to bring “H”’s profitability back on track to again be an attractive partner in the industry and for acquisition in the medium term.

Interaction with investors

It is the philosophy of the finance investor to be in close contact with the top management of the portfolio companies. Close contact in this case means weekly phone conferences and bi-weekly personal meetings, during which the detailed report that has been submitted by the portfolio companies the day before is discussed. According to the finance investor, close contact is vital because their speciality is restructuring and reorganisation companies that are near to bankruptcy. The investor team needs to follow closely the development of all financial parameters. Any negative development immediately results in a deep-dive discussion about the root cause and the potential countermeasures. The portfolio company management team is expected to have done the analysis and identification of possible actions already, but the investor team will still suggest different or additional actions.

Findings from the case of company “H”

The involvement of the finance investor team is very close and often ends in direct proposals on how to act or react. In the case of order fluctuations for example, the investor team immediately suggested adjusting the number of temporary workers. There was a clear request made by the investor team to cover all personnel required for a production load above 70% with temporary workers who could be hired or laid off at very short notice. All investments are checked stringently, but in most cases then approved when the portfolio company management presents a profitable business case or an investment

that is vital to maintain or improve the performance and market position. If an investment proposal is prepared accurately and thoroughly justified, it is not normally rejected, even if the money available for investments is very limited.

The product and process technology is considered by the investment team to be the centre of expertise of the portfolio company's first line management team. In the majority of the cases, decisions are made on the basis of a financial analysis prepared by the portfolio company management, which is then double checked by the investor team. The technical and technological aspects have to be outlined and explained only by the portfolio company management team. Only in cases where the proposed investment is huge (above 1 million EUR) is further external expertise acquired. Involvement in technology strategy can thus happen through approval of investments. There is no direct influence on the product or process technology by the finance investor team.

The outcome of the interviews summarised in brief

1. How often do investor and investee communicate?

➔ Phone calls are made each week. Personal meetings are scheduled every other week. During the phone calls, the topics discussed are limited to investment approvals, the book to bill ratio, turnover and the main light events since the last exchange. Other phone calls are made or emails sent when required.

2. Who (position/responsibility) communicates with whom (investor/investee)?

➔ The asset manager in charge at the finance investor's and the general manager of the portfolio company normally stay in touch with weekly phone calls and bi-weekly meetings. The first line management team of the company and additional people from the finance investor might join the meetings and calls as well when requested.

3. Which communication methods are used (e.g. email, phone, personal meeting)?

→ Naturally the most frequently used communication methods are phone and email, closely followed by personal meetings.

4. Are reports made regularly? If yes, what is the rough content of the report (key figures, projects,...) and who prepares/receives it?

→ A reporting tool that is updated every second week supports the bi-weekly personal meetings. Standard figures like turnover, the book to bill ratio, complaints, material flow times, etc. are updated by the general manager's assistant, the fine-tuning is done by the general manager and his first line management team.

5. Do the asset managers specialise in specific sectors, markets and/or products? If yes, what is the reason/justification (experience, expertise, individual interest,...)?

→ Asset managers often do have greater expertise in certain areas. In most cases this is due to their experience from previous investments and not necessarily linked with personal interests. But generally, most asset managers will go for any investment if they are convinced that it has the potential to lift its own value significantly. Monetary aspects normally dominate any personal interest or expertise.

6. When do investors involve or request 3rd party know-how and/or advice? Who is/can be the 3rd party (specific division of investor, independent consulting company,...)?

→ Only in very rare cases, when e.g. significant investments are under discussion. Normally in the case of "H" this only occurs when the spending being considered exceeds 1 million EUR or when a project would require more than 5 man-years for realisation.

7a. How much do investors care about the technology strategy of their portfolio companies?

→ It is a secondary area, which is on the financial investor's radar but not directly influenced by him.

7b. If they influence the technology strategy, on which basis do they do that (legitimation)?

→ No direct influence is exerted.

7c. From where do the asset managers receive their information (business analyst?, ...)

→ The personal network is the largest source of input. Consultants may be involved, but mainly in the pre-investment phase when the market position and potential of a buy-candidate is being evaluated.

8. What is the link / relationship between marketing, organisation, finance strategy influence of an asset manager and technology strategy influence?

→ In the case of "H", investor influence is in all three areas and the investment team reported that this is a regular occurrence in their investments. If such influence is exerted then it can also affect the technology strategy because it normally includes the allocation and dedication of specific resources, such as R&D. Influence on financial decisions clearly influences the technology strategy as it defines the available resources both in terms of direct investment and HR strategy.

9. Which tools can/do investors use to measure/judge if the technology strategy of a portfolio company will guarantee success in mid to long-term?

→ The asset managers utilise their networks and acquire some 3rd party expertise. In the case of "H" this was standard knowledge or analysis with some portfolio company specific supplementations.

10a. What opportunities do investors have to exert influence on their portfolio companies technology strategy?

→ They have the power to drive or stop ideas and decisions within their portfolio companies, both directly and indirectly. In the case of "H" not only the

general manager, but also the first line team was chosen with the involvement of the finance investor.

10b. What are the mechanisms/dynamics of influence? Do managers hide information – if yes/no – why?

→ One of the strongest influences originating from investor involvement is the selection of the portfolio company management team. This is strongly guided and driven by the finance investor. The investor is also a sparring partner for the first line team. Investor involvement in the customer relationship indirectly influences the direction of the technology strategy when customer specific projects require the application of new technologies. One of the core principles of the investor is an open dialogue without hiding or embellishing facts and figures. This is clearly agreed and would be no-go behaviour that the investor would not tolerate.

10c. Are all the investors (and asset managers) the same or are there differences between them?

→ The intention and ultimate target is the same for all – to increase company value. However, the methods and level of involvement differ quite a lot. While in this specific case the investor plays a quite active role by talking to customers and suppliers, for most of investors this is not an area in which they are involved. It is very important that such involvement is discussed, agreed and aligned beforehand. Otherwise it can cause severe damage and frustration on both sides. A build strategy is also an option for the investor when the investment is not improving as expected.

11. Is technology strategy indirectly influenced by e.g. budget decisions?

→ Yes, but not only. The more critical factor is the selection of projects, which is normally dominated by financial performance and the risk involved.

12. Do investors act as consultants concerning technology strategy and organisational learning? If yes, what are the consequences and results?

→ Not directly for the technology strategy, but in some aspects of organisational excellence and development. The consequences are more analytic, figure and fact driven decisions and less oblique actions and

behaviour. Whether this results in better performance is unclear but it gives the feeling of having things under control because of the use of different defined parameters that have to be monitored.

13. Are there cultural differences between different investors?

➔ Basically there are two main kinds of investors. The ones who do involve themselves in the business by talking to customers, suppliers, etc. and the others, who rely purely on the portfolio company management team to handle such things.

The case of company “I”

Data collection

The case of the company “I” was prepared with both primary and secondary data. The first step in the analysis of the investor – portfolio company relationship of the company “I” was to collect and review secondary data that was gained through the company website, the investor website, press releases and articles in magazines. Primary data was gained through one personal interview at top management level at the portfolio company and one interview with the private equity investor who was involved in this deal.

Company background information

“I”’s roots go back to an ironworks that was founded in the 16th century. Until the beginning of the 20th century, activity concentrated on the production of rough machinery for agriculture and industry. In the 1930s the orientation of the product changed significantly. Instead of rough machinery, “I” began to design and produce precision gear drives. This was a fundamental change from rough iron products to highly sophisticated mechanical engineering. In the following decades “I” steadily enlarged and adjusted its portfolio to market demand. Typical customers were the ship building industry and turbine manufacturers with all kinds of turbo applications.

In the 1970s “I” bought out a competitor in the turbo gear market and a licensing agreement was signed with a USA based company allowing this company to use “I”’s patents. In the 1990s some parts of “I” were sold and shortly after bought back from different industry groups. In 2002 a finance investor acquired “I”. The actual product range of “I” varies from gears that run at 3,000 1/min to gears that run at 80,000 1/min to support a power of more than 80 megawatt. Over the company’s history more than 15,000 different gear drives have been

developed and built. New challenges that cannot be met with existing products are the area where “I” puts its excellence and know-how into action.

The role of technology in company “I”

Most of the products manufactured by “I” are customer developments with specific requirements. New materials and production technologies are frequently required to realise the necessary precision and reliability. The R&D department at “I” works closely with the production team to ensure their ideas can be transferred into real products serving the customers’ needs. As the gear drives are used in a variety of applications, it is very important for the company to decide in which areas they want to be active. Different specifications require different designs for the gear drive and different materials. Going into too many areas can cause excessive expenditure and insufficient return. In 2000 for example, “I” exited the market for ship gear drives.

Ownership structure

From foundation to 2002 “I” was in the sole ownership of a large industry group, without any involvement of finance investors. In 2002 “I” was sold as a unit to a finance investor who took over 100% of the shares with the target of optimising business so that the market value increased over a few years. After some restructuring and good results “I” was sold to another finance investor in 2005. The new owner kept the company for two years before “I” was again successfully sold to an industry group active in the area of gears. The ownership structure has remained unchanged since 2007 and “I” is one of the world’s market leaders for gears and turbo applications.

Interaction with investors

The first investor who came on board in the year 2002 was a relatively small German private equity fund specialising in small and medium companies with an investment volume around 500 million EUR. This investor only has

companies from Northern Europe in its portfolio and plans on continuing this strategy. However, global expansion of the companies in which they do invest is one of their main objectives. The first investor pushed expansion in the Americas and Japan. Sales offices in these regions were opened and supported by the finance investor's network. The global relationships of the finance investor team were considered to be highly valuable by the portfolio company for both sales growth and foot print expansion. The investor management team was involved in all decisions with strategic importance or significant impact on the P&L account.

All the investor management members have extensive experience of senior and C-level management of companies. Targets defined by a finance investor drive their decisions, but at the same time they have know-how about side effects that are not initially visible for someone who is purely figure driven and without practical experience. The key executives at the portfolio companies are also expected to invest their own money in the business. This is to ensure their maximum engagement and offer them a premium in the event of a positive sale of the company. To invest from "private" pockets is considered a very effective and safe way to get commitment from people to pursue the same targets as the rest of the shareholders. After the sale to the second investor in 2005, the picture did not change fundamentally, only slightly. The new investor requested the management to increase their shares, again from their own pockets.

At the same time, the investor kept a strong focus on the company's market position, as he was convinced that the market position is linked to the IRR that can be gained from an investment. The relationship with the second investor was a close cooperation based on regular meetings and decisive involvement in decisions regarding product mix and market strategy. Not in this specific case but generally, the investor continually screens the market for other companies that can be merged with their portfolio companies to make more from both individual businesses. Direct involvement in technology strategy is not in the focus, but it was an indirect consequence of renewal of the machinery park and

production equipment in the case of “I” as well as in other cases. The second investor is clearly attracted to companies which have a good market position but may be losing ground because essential investments have not been made in the recent years. With the support of the advisory team, investments are made to ensure the operational excellence is state of the art, so that the business is a strong player in the field not only in the short term but also in the medium and long term.

Findings from the case of company “I”

The two finance investors had a positive impact on the operative financial results and market value as well. The strategy of making each member of the executive management team a partial owner of the company seems to be a strong motivator. The direct financial injection from their own pockets had a strong influence on how decisions were made. For example, exchange with the other executives within the company increased. Instead of making conservative decisions without too much involvement by others, the tendency was to accept more risk by involving other stakeholders in the decision-making process. Important examples were the updating of manufacturing equipment, which had long been overdue. However, due to the large amount of money needed, the decision to invest was not made before the finance investor came on board. From this perspective, involvement of the investor was very positive.

The regular weekly exchanges in the form of personal meetings or conference calls were pretty demanding for the portfolio company management team, because a strong follow up of actions was defined. But then again, the targets were challenging, but achievable. And at the end of the day, each executive did benefit from a nice bonus payout from the shares they were holding. The production equipment update was also an update of the technologies used in production. So this can be seen as involvement in the technology strategy, however, the definition of the equipment and technology to be used in the coming years was not made by the investor team but the portfolio company management.

The outcome of the interviews summarised in brief

1. How often do investor and investee communicate?

➔ The frequency of exchange was always similar. Both investors requested weekly exchanges, most of the time in the form of personal meetings, either at the portfolio companies or at the investor's office. If a personal meeting could not be arranged, it was replaced by a conference call. This happened in approximately fifty percent of the cases because attendees from both sides travelled a lot. In between the weekly meetings or "keep-in-touch" calls, additional phone calls and email exchanges were the rule. The investor team wanted to have the same level of knowledge and information as the C-level management of the portfolio companies. This ensured a good basis for the weekly exchanges as well.

2. Who (position/responsibility) communicates with whom (investor/investee)?

➔ From the investor side, the rule is that depending on the size of the investment, 1-5 partners were involved in the meetings or "keep-in-touch" calls. In the case of "I", three people were allocated. From the portfolio company, it was the full executive management team, consisting of 4 people.

3. Which communication methods are used (e.g. email, phone, personal meetings)?

➔ The most frequently used communication methods were phone calls and emails. The most important method was the personal meeting. Personal attendance of a meeting was considered mandatory for decisions that were of high importance for "I", either because of e.g. the impact on the market position or the P&L. Both sides commented that because of extensive exchange by phone and email before and after the personal meetings, the meetings were very effective and not exhausting at all.

4. Are reports made regularly? If yes, what is the rough content of the report (key figures, projects,...) and who prepares/receives it?

➔ Because of the close contact and exchange, there is no separate reporting system for the investor, but the internal monthly reports (sales figures, product

margins, quality KPIs, finance bridge budget versus actual) are shared with the investor.

5. Do the asset managers specialise in specific sectors, markets and/or products? If yes, what is the reason/justification (experience, expertise, individual interest,...)?

→ None of the investors had any specialisation in sectors, markets or products. However, the investor team did have some experience from other investments or their own history in the industry. Parameters that are of importance are the company size for example. Typically the businesses are small or medium (two digits or low 3 digits million EUR turnover), often previously privately owned and with potential for improvement in market position or efficiency.

6. When do investors involve or request 3rd party know-how and/or advice? Who is/can be the 3rd party (specific division of investor, independent consulting company,...)?

→ In the case of "I", third-party expertise was brought in for the pre-investment phase, but not during the investment. Some members of the investor management team might have discussions with colleagues and people from their network, but not in the framework of hiring or paying for expertise, but just in the form of friendly feedback and advice.

7a. How much do investors care about the technology strategy of their portfolio companies?

→ In the case of "I", the technology strategy was mainly an issue in the area of production. The machine park and the production processes were not state of the art when the investors took over the business. This was one of the major reasons for the acquisition. The product margins were shrinking because of mandatory price downs without any possibility of lowering the manufacturing cost with the existing machinery park. The key driver for the acquisition was the knowledge that investment in the area of production could potentially rescue the company. Regarding the products themselves, no influence on technology was exerted.

7b. If they influence the technology strategy, on which basis do they do that (legitimation)?

→ The investors did not really have the upper hand when they were driving actions to update the production area. It was known in the market that “I” had not been making adequate investment for a long time, and the management of “I” had been reluctant to spend a lot of money to serve mainly positive long-term effects and also because of the risk linked with a large investment that cannot be financed by the company itself. In the case of “I”, the investor was pushing forward things that had been known to be necessary for a long time, but not followed up or performed with the necessary priority.

7c. From where do the asset managers receive their information (business analyst?, ...)

→ Advice came only from existing networks, unpaid but highly valuable.

8. What is the link / relationship between marketing, organisation, finance strategy influence of an asset manager and technology strategy influence?

→ A link that clearly exists between marketing and technology strategy is pricing. When the technical evolution is going forward, this affects both the product characteristics and production technologies. If the product characteristics are unchanged, but production becomes more efficient then production costs go down. This can lead to increased margins or, depending on the market and the competition, to price erosion. Pricing is driven by competition. If competitors are able to reduce their production costs because of the application of new technologies, other players in the same field have to follow with pricing and subsequently with the new production technology. Over time the business will shrink if prices are not adjusted to keep margins stable or it will go bankrupt if pricing is unaltered despite the fact that margins are insufficient to guarantee company survival. In the case of “I”, investor influence was confirmed in all three areas of marketing, organisation and finance strategy as well as some impact on technology.

9. Which tools can/do investors use to measure/judge if the technology strategy of a portfolio company will guarantee success in mid to long-term?

→ Judgements and evaluations are made on the basis of business case calculations. The assumptions made are examined, so they have to be realistic and plausible. Again, the investor management might involve people from their network for advice regarding a portfolio company proposal.

10a. What opportunities do the investors have to exert influence in their portfolio companies technology strategy?

→ In the both cases of investor involvement in “I”, the investor had close to 100% ownership, so they could theoretically dictate the portfolio company management’s actions. However this does not concur with the approach that is followed, which is an open discussion with the investor setting some targets that might involve necessary actions in the area of technology strategy. Ultimately the proposals on what to do and how to do it in detail, have to come from the portfolio company. The finance investor is more a coach or consultant, the difference being that they are only paid if the proposals produce good returns whereas consultants are paid for ideas regardless of the final results.

10b. What are the mechanisms/dynamics of influence? Do managers hide information – if yes/no – why?

→ Beyond a certain degree of involvement, a portfolio company manager cannot hide information. If they tried to do so and was discovered, they would be fired immediately. The situation is different for large organisations or investments with several minor shareholders, where each individual shareholder is not involved in day-to-day business. In the case of “I”, honest and open communication in all topics goes without saying.

10c. Are all the investors (and asset managers) the same or are there differences between them?

→ Differences can be huge both in terms of personality and in the philosophy and strategy of an investment firm. Involvement may range from driving the healthy shrinking of a company by strongly reducing business activity to driving strong growth and an investment plan. Typically, investors and asset managers

are experts in one or other area. Some might master both challenges, but generally a certain preference for one or the other activity is prevalent. Due to the fact that organisational changes often occur during the time of investment, expertise with companies of a comparable size, etc. is preferred.

11. Is technology strategy indirectly influenced by e.g. budget decisions?

➔ Money makes the world go round and makes changes happen. If investments are not approved, changes cannot happen. This applies not only, but also, to the area of technology strategy.

12. Do investors act as consultants concerning technology strategy and organisational learning? If yes, what are the consequences and results?

➔ The answer is yes for both investors who had major shares in "I". They were both specialists in small and medium companies, mainly because in such companies – especially when they are still in family ownership – huge potential can be turned into profit when an experienced management or advisory team is involved. For the portfolio companies this is a very fruitful interaction as it makes them more competitive instead of being behind the times with processes, products and footprints.

13. Are there cultural differences between different investors?

➔ The major difference is the target market. The focus is either on a specific region or company size or a global approach is taken without specific limiting factors.

The case of the company “J”

Data collection

In preparation for analysis of the investor – portfolio company relationship of company “J”, both primary and secondary data was used. Secondary data was gained through the company websites, press releases and articles in specific magazines. Primary data was gained through one interview at top management level at the portfolio company and two interviews with the private equity investor.

Company background information

The company “J” was founded in the late 1990s in eastern Germany as a manufacturing and distribution company for solar panels. “J” grew fast due to government incentives and a general trend for solar panels as a source of electricity. This attracted several investors and in 2004 one owned around 80% of the shares. In 2008, when the business was sold to a large German industry group, the annual turnover was hitting the 300 million Euro mark. In the period from 2004 to 2008, the majority shareholder was on board. During that time several acquisitions were made, mainly to increase the internal added value, but also to secure the supply chain, as the raw and semi-finished materials were sometimes in short supply because of a global boom in that segment. The main acquisitions made were a business specialising in ingot and wafer production (2005) and a business specialising in silicon recycling (2006). “J” grew from a small group of people who started the business to a 1,200 people business with a 70 million EUR EBIT in 2008. This is a very good example of a growing company which improved and increased in all areas when a majority shareholder was on board.

The role of technology in company “J”

The solar cell and wafer business is driven almost exclusively by technology. Manufacturing processes and production cycle times as well as the effectiveness of the panels change rapidly. Continuous follow up of the latest trends and implementation of up-to-date technologies in both production and R&D is vital to be a key player in this segment. A good understanding of the whole process and technology is also a must in selecting companies suitable for a takeover and their subsequent integration.

Ownership structure

From a start-up company founded in the late 1990s with a variety of small investors, one investor became dominant in the year 2004. This investment firm managed to take over around 80% of the shares. This remained unchanged until 2008 when the portfolio company was sold to a large German industry group. “J” has been in the ownership of this industry group since 2008. The information gained from this interview came from the majority shareholder who was on board from 2004 to 2008.

Interaction with investors

A strong belief in the photovoltaic market in the 21st century was one of the main motivations for the investor to acquire a dominant share of “J”. The finance investor pushed for an acquisition strategy aimed at becoming a highly integrated and leading player in the field of solar cells and panels. The cooperation between both management teams was excellent, even though discussion regarding the details of the financing and manufacturing footprint were tough going. The finance investor played a very strong, but supportive role. The acquisitions and the capacity extensions were dominantly financed through the investor. Bank credits were negotiated in cooperation with, but under the lead of the finance investor. In the R&D process, the finance investor exerted no influence, but for sure the technology portfolio did change with the acquisitions made. Decisions that often had to be made concerned which part

of the value chain should be integrated into “J” and with which company this would make the most sense. Third-party advice was used on many occasions as the solar cell market is fast changing and very complex. This was the case before the investor bought the majority of the shares and it happened again with each company acquisition and integration. Decisions regarding capacity extensions were also made with external evaluation of the assumptions made to minimise the risk involved.

Findings from the case of company “J”

In the case of “J”, there was an indirect influence on the technology strategy because of the investor’s philosophy of increasing the internal value added to the company through acquisitions. This was not a direct influence, as the investor team did not evaluate the technologies used by the acquisition targets, but it was an indirect influence as it changed the technology focus and strategy of “J”, simply because the area of activity was growing. Compared to the other cases in this research project, the focus here was clearly on expansion and the will to create a major player in a growing market that could later be sold with a nice premium margin, either to another investor or to an industry holding. The entire investor team was enthusiastically active in the project. The success of the company fed their motivation to push the growth strategy. Besides the aforementioned involvement, the investor team was deeply involved in steering activities. Progress reports on important projects as well as the key financial and sales figures were analysed and discussed carefully each month. If everything was on track the cooperation was very smooth. In case of deviations from the plan or from previous commitment, the investor demanded rigorous action plans to achieve the targets and plans agreed earlier.

The outcome of the interviews summarised in brief

1. How often do investor and investee communicate?

➔ There was continuous contact by phone and email, maybe not every day, but several times per week. A pre-defined and structured report was required once

per month. For important projects separate meetings took place with someone from the investor team's steering committee.

2. Who (position/responsibility) communicates with whom (investor/investee)?

→ Basically the management teams of both parties, but also the back office team from the finance investor was in touch with people from C-level management of the portfolio company.

3. Which communication methods are used (e.g. email, phone, personal meeting)?

→ Phone and Email, followed by personal meetings.

4. Are reports made regularly? If yes, what is the rough content of the report (key figures, projects,...) and who prepares/receives it?

→ A reporting tool that is updated every second week supports the bi-weekly personal meeting. While the standard figures like turnover, the book to bill ratio, complaints, material flow times, etc. are updated by the general manager's assistant, the fine-tuning is the task of the general manager and his first line management team.

5. Do the asset managers specialise in specific sectors, markets and/or products? If yes, what is the reason/justification (experience, expertise, individual interest,...)?

→ Asset managers often have greater expertise than the portfolio company in certain areas. In most cases this is due to their experience from previous investments and thus not necessarily linked with personal interests. But generally, most asset managers will go for an investment if they are convinced that it has the potential to lift its own value significantly. Monetary aspects usually eliminate any personal interest or expertise.

6. When do investors involve or request 3rd party know-how and/or advice? Who is/can be the 3rd party (specific division of investor, independent consulting company,...)?

→ The involvement of 3rd party advice was more or less permanent, due to the extensive growth strategy, but the reasons for involvement were various (pre-investment evaluation, M&A advise, strategy consulting, market studies, etc.).

7a. How much do investors care about the technology strategy of their portfolio companies?

→ In cases like “J”, technology is very important, as the target was to create a major player in the field of photovoltaic, and to be on top, it is vital to have leading edge technology on board.

7b. If they influence the technology strategy, on which basis do they do that (legitimation)?

→ None of the decisions regarding technology were driven purely by the finance investor, but led by the company management with advice from 3rd party companies and with the agreement of the finance investor as a kind of final approval.

7c. From where do the asset managers receive their information (business analyst?, ...)

→ External consulting firms, the professional network and in a synthesised form from the back office team of the finance investors.

8. What is the link / relationship between marketing, organisation, finance strategy influence of an asset manager and technology strategy influence?

→ Due to the fast growing market, support for the expansion had to be all-embracing. A direct link with the technology strategy was not present, but the technological evolution was positively impacted indirectly, because budgets were kept or boosted in line with the global expansion strategy.

9. Which tools can/do investors use to measure/judge whether the technology strategy of a portfolio company will guarantee success in the mid to long-term?

→ Analysis was primarily contracted out to 3rd party companies, which analysed both the competitors and the market. It is more important to be ahead of competition and in line with the market needs than to be out of sight for competition with regards to technology.

10a. What opportunities do investors have to exert influence in their portfolio companies technology strategy?

→ Basically a finance investor can push the board in any direction when the share bucket is big enough. In reality however, no investor team would force a portfolio company to follow a certain direction in technology, but they might nominate a CEO or consultancy that they considered knowledgeable and trustworthy.

10b. What are the mechanisms/dynamics of influence? Do managers hide information – if yes/no – why?

→ Managers might play with the way that things are presented and how they set their focus. To intentionally hide information which is important for the finance investor team would cause an immediate loss of trust and most probably the staff member would be fired with immediate effect. Managers for sure use the space they have to manoeuvre and promote their own interests, to maximise their bonuses or to follow another specific interests, but if they are clever, it is never done in an obvious way so they cannot be blamed for incorrect behaviour afterwards.

10c. Are all the investors (and asset managers) the same or are there differences between them?

→ Investors are quite different depending on where they have come from (experience), what their interests are (e.g. specific sector or market), what their network is and where they want to go (intention for a specific investment). All investors might act differently depending on their background. In the case of J, a build strategy had been planned.

11. Is technology strategy indirectly influenced by e.g. budget decisions?

→ The budget can of course be a limiting factor. Also other parameters can negatively impact technology. If, e.g. the financial result is going down and the company's survival is at risk, technology becomes a secondary factor and making savings in that area might be considered a quick fix. Later on more may well have to be spent to catch up, but it is usual to cut costs in such areas, if financial results are deteriorating.

12. Do investors act as consultants concerning technology strategy and organisational learning? If yes, what are the consequences and results?

→ No regarding technology strategy, but yes regarding organisational learning. Most asset managers have extensive practical experience either from their management positions at companies or from other investments. Particularly for companies which are growing or in a situation where radical changes are on the way, such experience does influence portfolio companies. How strong the influence actually is depends on the portfolio company management teams and the individual investors. The approach can be pretty different from both sides. It may be that the CEO is cooperative and appreciates extensive exchanges with the finance investors (so in effect the investor team is the consultant). But then again, a turn-around manager may be extremely experienced and not want to be dictated to by others.

13. Are there cultural differences between different investors?

→ A major difference between investors is one of size. Large investors target – sometimes in cooperation with other investment firms – large enterprises, and smaller investors focus on small and medium enterprises.

The case of company “K”

Data collection

Analysis of the investor – portfolio company relationship of company “K” used both primary and secondary data. Secondary data was gained through the study of company websites, investor website, press releases and newspaper. Primary data was gained through two personal interviews at top management level at the portfolio company and one interview with the current investor.

Company background information

The roots of “K” are in the southwest of Germany, where in the late 19th century three family members founded a company to produce glass objects. In the early 20th century it merged with another company active in the same area before founding further plants over the next few decades. These included the first mirror glass trough and then plants with manual machinery and equipment for glass grinding and glass polishing. From the mid 20th century production ran continuously and was automated, in line with the latest technological evolution in glass making for both flat and hollow glass. Installation of the first 24/7 mirror conveyor in Europe as well as implementation of automated edge grinding and bending kilns drove competitiveness in the 1940s and 1950s. Further milestones were in the 1970s when the production portfolio was supplement with a plant for mirror vapour deposition coating, marking the start of production of mirrors used in the solar industry.

In the early 1980s the first fruits from the investment in solar mirrors were reaped. Orders for several million square meters of mirrors were received from global investors for installation in California and Spain. To further strengthen their position in the solar mirror market, investment has been made in leading edge cathode sputtering technology for the production of chrome glass and blue tint calottes. An electron-beam-coating instrument was installed at the same

time to improve reflection behaviour. The focus on technology continued through the 1990s with construction of a coating conveyor for the wet chemical silvering of non-flat glass, such as mirrors and calottes (fully automated process) and sag bending for calottes. After launching a sputtering plant for indium oxide and anti-reflection coatings, three companies in three different countries were also acquired in the 1990s to secure local calotte sales. In the early 2000s the automotive mirror division of a large competitor in the glass market was taken over, with manufacturing sites in both Germany and Hungary. In the following years, there were three more acquisitions in Europe, one in the Americas and the formation of a joint venture in China to contribute to a very strong global manufacturing footprint.

The role of technology in company “K”

The production process for glass has always been complex and capital intensive. Innovations, incremental technical developments and improvements are critical for survival. The delayed detection or implementation of a new technical development can lead to a competitive setback that is difficult to make good. This applies equally to standard products and changes in the production process and also the more sophisticated products that are developed in line with the new technologies. Since foundation, “K”'s manufacturing processes and product characteristics have changed fundamentally. Incremental automation of previous manual processes has improved both product quality and production cost.

The permanent integration of leading edge technology is a must for a company that wants to play a dominant and leading role in this market segment. Without the technological improvements mentioned in the previous paragraph, “K” would be nowhere near where it is today in terms of market position. It is quite possible it may even have disappeared from the market altogether. If a company wants to make a start in this business today, an initial investment in the high 2 digit million Euro range would be required. This illustrates both the

complex requirements of being in that segment, but also the advantage of being in the leading group.

Ownership structure

The germ cell of “K” was a company founded by three people in the southeast of Germany in the 1880s. They started the business with 3 glass furnaces. Twenty years later the business merged with a competitor about 200km away. For the next half century, ownership was unchanged until in the mid 20th century when a German industrial holding acquired the majority of the shares. A few acquisitions and roughly 30 years later, one of the top global players in the glass arena acquired the majority of the shares in “K”. The same acquisition strategy also continued under the new ownership. In 2000 the majority owner decided to cut “K” from the rest of the group. This happened within the context of a management buyout and the first time in the history of “K” a dominant finance investor was involved in the company as the major shareholder. This shareholder held the majority of the shares until 2008. The buyer was another finance investor who still owns the majority of the shares in 2012.

Findings from the case of company “K”

The finance investors were very demanding regarding their involvement and interaction. Weekly meetings with at least one C-level representative were mandatory. But preferably all three executives were expected to attend these meetings, which typically were held in the office of the finance investor. One C-level executive left “K” because this was too invasive for him. Having said that, it has to be added that the control was very much on the costing and marketing side. In fact the meetings were held to discuss, time and time again, the planned investments. Furthermore, the investor believed that a continuation of the previous acquisition strategy was good and that it was maybe even vital for “K” to keep and further improve its market position. Even though this did not represent a change to the pre-investor phase of the business, the authority of the executive team had been slashed.

In some aspects, the investor team appeared to have more trust in the people from within their own professional network than in “K”’s management team. For some of the managers, this was not an issue, they simply followed the advice. However, as mentioned above, not all the management members reacted in the same way. Technology strategy was not a primary target, which does not mean the finance investor team was not interested in the technology strategy. They did have more trust in the competency of the portfolio company team with regards to technology strategy and deciding the right way to go. But when it came to deciding how to get there, the finance investor again became more involved. A standard question was always whether it would be possible to achieve an advance in technology by acquisition instead of own research. Acquisition has the effect of speeding up the learning process and reducing uncertainty.

The outcome of the interviews summarised in brief

1. How often do investor and investee communicate?

→ For the investors, weekly meetings with the portfolio company management are mandatory. Due to a short distance of around 200km between offices, this was manageable from the pure timing point of view, but at the same time very exhausting for the management team of the business. One board member found this level of control unacceptable and left the board. In addition to the meetings there was an intensive email exchange and phone calls during the week.

2. Who (position/responsibility) communicates with whom (investor/investee)?

→ The expectation of the finance investor management team was to see the executive team at the personal meetings. Experts for certain areas such as e.g. finance, R&D or operations would join the meetings from time to time, but this was the exception rather than the rule. At the request of the finance investor team, 3rd parties such as consultants or experts from the investors professional network would take part in the meetings as well.

3. Which communication methods are used (e.g. email, phone, personal meeting)?

→ The preferred communication method, not necessarily in terms of frequency, but definitely in terms of exchange and effect, was personal meetings. Phone calls and emails were more for the fine-tuning that always followed after the face-to-face sessions.

4. Are reports made regularly? If yes, what is the rough content of the report (key figures, projects,...) and who prepares/receives it?

→ Some figures are discussed each week, like the book to bill ratio, new RFQs, project reviews and the general highlights and low-lights. A very detailed report including financial statements is compiled.

5. Do the asset managers specialise in specific sectors, markets and/or products? If yes, what is the reason/justification (experience, expertise, individual interest,...)?

→ Asset managers typically have superior experience in specific markets, business types (e.g. SMEs) and/or product types. Their investments can, but do not necessarily have to, match their experience. The more their individual experience correlates with a business, the greater the involvement is likely to be.

6. When do investors involve or request 3rd party know-how and/or advice? Who is/can be the 3rd party (specific division of investor, independent consulting company,...)?

→ Third-party support is required for each M&A activity, in the screening and evaluation process and in the implementation process. Furthermore, investments in new markets and new technologies require global benchmark information. The 3rd parties in most cases are independent consultancy firms. In addition, the personal networks of the investor team play a strong role.

7a. How much do investors care about the technology strategy of their portfolio companies?

→ In the case of “K”, the intention of the investor was to continue the trend as a market leader with leading edge technology. Thus the push was on having a focus on the production processes, changes in technological opportunities and other companies. The expectation of the investor was that the portfolio company management at all times should know where they stood in comparison to competitors in the same market and in which direction the trend was going.

7b. If they do influence the technology strategy, on which basis do they do that (legitimation)?

→ “A finance investor should never know better than their portfolio company management what the right technology strategy for the business is, otherwise it is the wrong management” one of the interviewees said. However, an investor can always act as a coach by asking why certain trends are followed or not followed, why the action plan differs significantly from what competitors are doing, etc. A certain understanding and sense of the business is vital, but the roles and responsibilities should never be mixed.

7c. From where do the asset managers receive their information (business analyst?, ...)

→ From 3rd party consultancies, personal networks and external business analysts. The investor back office collates, evaluates and interprets the data to draw conclusions.

8. What is the link / relationship between marketing, organisation, finance strategy influence of an asset manager and technology strategy influence?

→ Technology strategy is correlated with the areas above. The implementation of new production technologies, for example, requires suitable adjustments and action in the organisation – it is not just about placing an order at a machine construction company. Sometimes process flows have to be adjusted, people have to be trained, etc. The same applies to new product technologies. The organisation has to adjust and follow these evolutionary processes. If an

organisation is inflexible or unwilling to change, it is difficult to change the direction of the technology strategy. As money is involved in all such issues, financial strategy is of significant importance as well. If cost reduction and cost savings are the highest priorities – for whatever reason – the technology strategy options are very much limited. The marketing direction kind of sets the scene for the technology strategy. Technology strategy has to be aligned to the marketing direction. It can be vice versa, but normally it is this direction.

9. Which tools can/do investors use to measure/judge whether the technology strategy of a portfolio company will guarantee success in the mid to long-term?

➔ Any investor or leader making any kind of decision or judgement requires a large input. It always includes own experiences and know-how gained from the past as well as the latest trends and actions taken by other companies, studies and analysis carried out by third-party companies or people, either on specific request or in the framework of a general service available to everyone. Furthermore, any input from the personal network might be valuable as well. The business decisions commonly made by the board of the portfolio company or the investor management are based on all this data. The role of the investor is to ask critical questions and based on the response from the portfolio company to evaluate whether this is a direction worth supporting.

10a. What opportunities do investors have to exert influence in their portfolio company's technology strategy?

➔ In the case of "K", it is clear that the weekly meetings are the place where business decisions are discussed and agreed. It is very straight forward, but with very little freedom for the portfolio company management team.

10b. What are the mechanisms/dynamics of influence? Do managers hide information – if yes/no – why?

➔ Each person has their own views, preferences and perceptions. Thus opinions, actions and suggestions are different from person to person for one and the same situation. Such discrepancies can easily cause conflict when one party believes the other is trying to cheat or to hide something. However, open discussion and arbitration solve all such potential conflict. If a manager really

tries to hide something intentionally, to cover their own failure or support their own preferences, the investor side will take strong action

10c. Are all the investors (and asset managers) the same or are there differences between them?

→ The focus of all finance investors is the same – to grow the value of the investment. There are for sure differences in the way this is achieved and in the selection process when an investment is being made. This depends on the investors' own individual preferences, experience and on the input they get from 3rd party advisors. During the investment phase, the company was restructured to allow a burst which would improve the return from sale.

11. Is technology strategy indirectly influenced by e.g. budget decisions?

→ There is no doubt that budget can be a limiting factor for any technology development or strategy, no matter whether it is product or process technology. Besides market trends, mergers the portfolio company that occur as part of the overall investment will also influence technology strategy.

12. Do investors act as consultants concerning technology strategy and organisational learning? If yes, what are the consequences and results?

→ Definitely yes! Partly with their own and partly with 3rd party input. Investors are often able to make a significant contribution to the organisational learning processes. The main areas are reporting, decision making processes and global organisation, which is often where small businesses that have been growing quickly lack experience. Investors can provide guidance which avoids costly trial and error. For the technology, the 3rd party input, that investors often consider as vital before a decision of strategic importance is made, is the biggest contributor. The result is a more structured and data based decision-making process which takes account of potential changes to the environment and the underlying parameters.

13. Are there cultural differences between different investors?

→ Yes, even if the general target – to grow value – is the same for everyone, the ways chosen to reach the target are different. Some have a very short-term business approach and take severe action to produce a result within weeks or

months. Some prefer a more long-term approach. The different investor types select their investees accordingly, which means there is often no choice, but one approach will be more appropriate for one business than another.

The case of company “L”

Data collection

Analysis of the investor – portfolio company relationship of company “L” used data gained through the study of existing secondary data, such as annual reports, the company website, press releases and one personal interview with a board member of the portfolio company. One asset manager from investor side who had been involved in the investment in 2011 was interviewed.

Company background information

The company “L” was founded in the beginning of the 20th century in central Germany as a family business. Starting with simple metal parts for various applications, the turnover was moderate for the first few decades. From the 1950s “L” specialised in products for televisions and radios. These included decorative parts and knobs. For a further thirty years “L” simply followed the customers’ needs in terms of design and function. The whole firm was dependent on the brown goods industry and followed the trends in this segment. In the 1980s one of the founder’s daughters took over the company management and started to work on the customer base and the product portfolio.

Over the next 25 years “L” became an almost 100% automotive supplier for decorative parts, such as loudspeaker covers, dashboard components, handles, armrests, etc. Due to the large number of products, the target was to stay close to the customers, thus the primary location was always Germany. To serve the US market, a moulding factory was acquired in the US in the 2000s to supply the markets there. When the company went into bankruptcy in 2010 it had around 1,000 employees with an annual turnover in the range of 100 million EUR. In early 2011, an experienced finance investor bought the business with the target of getting the company back on track.

The role of technology in company “L”

Both production technology and product technology are of high importance for “L”. The manufacturing processes for decorative parts are often linked with the product technology. This means new product technologies require or maybe are initiated by innovations in production technology. Imitation leather moulding, for example, was one of the most significant steps in the last centuries, born through a process innovation which brought new product specifications with it. Of the two most critical areas of “L”’s products – design / touch and feel – the one with more technological innovations is the touch and feel. Some of the shapes that are produced using the technology of today, would have been difficult to manufacture years ago, but probably would have worked with a great deal of effort. Some of the haptics however, simply cannot be produced without the latest production equipment.

Ownership structure

Since its foundation until 2010, “L” was in the sole ownership of the founder’s family. A change in ownership only took place because of insolvency in 2010.

Interaction with investors

The investor is fully involved in day-to-day business. Even before the acquisition was confirmed, some initial restructuring decisions were discussed and agreed in a cooperative manner. During the investment phase, it can happen that additional companies, which work in the same area, are brought in. The management team was replaced in its entirety and the investor team selected the new team by choosing people with senior management experience from similar positions and segments. The strong background of the investor in the area of restructuring was found to be extremely useful and valuable. Cooperation was tough but focused on compromise and commitment. The top priorities were management restructuring, strategic decision-making and reorganisation.

Findings from the case of company “L”

The investor team is heavily involved in the actual business of “L” in different areas. First priority was the restructuring of the company – to have the right people in the right positions supported by the best financial and organisational structures. A solid business plan is part of this restructuring and includes strategic planning of the firm’s future. This includes technological aspects that the investor team evaluates. The strategy definition is a round table process, prepared and detailed by the management team of the business, but discussed by all involved. The influence that the investor team might exert there is based on data collection and evaluation based on market assumptions or analyst input. It is clear the investor team does not have a better understanding of what is the right technology strategy.

The outcome of the interviews summarised in brief

1. How often do investor and investee communicate?

➔ The investor team is permanently involved in the business as “L” is just coming out of insolvency and the current status of the company is critical. Thus all opportunities and issues have to be communicated and discussed on an immediate basis.

2. Who (position/responsibility) communicates with whom (investor/investee)?

➔ Communication usually takes place between the C-level team of the portfolio company and the investor management team. Depending on the agenda, further people from the investors back office might join the meetings instead of everything being dealt with by PowerPoint files and email.

3. Which communication methods are used (e.g. email, phone, personal meeting)?

➔ The most frequently used communication method is phone, followed closely by email. Personal meetings take place more than once a month at a variety of locations.

4. Are reports made regularly? If yes, what is the rough content of the report (key figures, projects,...) and who prepares/receives it?

→ “L” provides reports which are updated monthly with ad-hoc updates during the month. The report includes the progress on defined restructuring measures, potential new businesses and several KPIs such as quality, scrap, time to quote, customer feedback, etc.

5. Do the asset managers specialise in specific sectors, markets and/or products? If yes, what is the reason/justification (experience, expertise, individual interest,...)?

→ The specialisation lies more in the type of company and the individual company situation. In the case of “L” the investor was a specialist in businesses that are in or just out of insolvency. The investor team had built up specific know-how in that area.

6. When do investors involve or request 3rd party know-how and/or advice? Who is/can be the 3rd party (specific division of investor, independent consulting company,...)?

→ Only for strategic decisions with long-term effects. In the case of “L”, the focus is more on the short-term, to restructure the company so that it can survive in the difficult automotive market. If a company is going to be merged with another investment, 3rd party advice would be brought in – typically in the form of an external consultancy specialised in that area.

7a. How much do investors care about the technology strategy of their portfolio companies?

→ If the product portfolio or the production technology had been the root cause of the insolvency, an action plan to overcome this situation would have been developed. However the reasons for insolvency are varied. Thus it cannot be said that technology strategy is of no interest, but it is definitely not at the top of the priority list.

7b. If they do influence the technology strategy, on which basis do they do that (legitimation)?

→ The former management made several major mistakes in trying to turn on the technology screws. Bringing such a business back on track can only be done with the right people. Thus the only way forward would be to hire people with the right know-how and expertise. The investor team focuses on other topics, such as the organisational structure in general, but not normally technology.

7c. From where do the asset managers receive their information (business analyst?, ...)

→ Main sources are the professional networks and external analysts who supplying investment information. Due to their small size, the investor company does not have its own analysts, but relies on 3rd party sources.

8. What is the link / relationship between marketing, organisation, finance strategy influence of an asset manager and technology strategy influence?

→ All such decisions correlate to each other – some more, some less, but actions do not result in isolated effects. For firms that are just out of insolvency, the focus is often on restructuring and design of a solid fundament. While technology is important, in most cases it is only steered indirectly.

9. Which tools can/do investors use to measure/judge if the technology strategy of a portfolio company will guarantee success in mid to long-term?

→ Typically, a business plan is tested and evaluated by a third-party company. This additional input feeds into the decision making process undertaken cooperatively by the investor team and the portfolio company. However each significant expenditure has to be approved by the finance investor, and this is where a stalemate often occurs.

10a. What opportunities do investors have to exert influence on their portfolio company's technology strategy?

→ With a close to 100% ownership, there is no question about whether the finance investor can dictate which way to go. For some things like

organisational changes, cost cuts, footprint adjustments, investors often do act this way – giving orders to the top management and demanding immediate action. Time is money...

10b. What are the mechanisms/dynamics of influence? Do managers hide information – if yes/no – why?

→ The standard process is to put a new management in place in firms that are in or just out of insolvency. These people do not have to cover anything from the past or to give misleading information, simply because they are new and the mission is normally clear – to bring the company back on track. The people who have worked at such portfolio companies for a long time are sometimes reluctant to be transparent, but it is quickly clear to them that they have to pull in the same direction, otherwise they will be replaced.

10c. Are all the investors (and asset managers) the same or are there differences between them?

→ As each human being is an individual, their work style and preferences are also individual. This is not (only) because of the DNA they have had since birth, but also because of past experience. Some specialisation does normally happen.

11. Is technology strategy indirectly influenced by e.g. budget decisions?

→ Cost structures and clear business plans are highly important for each business, no matter whether it is a start-up or if a mature business has to be restructured. A business can only survive when a positive cash flow is generated. It may be said that cash is king. Subsequently technology expenditure has to be strictly controlled, like all other spending. In most cases, the strategic investments will be cut instead of other investments when short-term survival or competitiveness is at stake.

12. Do investors act as consultants concerning technology strategy and organisational learning? If yes, what are the consequences and results?

→ Yes – investors basically provide consultation, management and coaching. Theoretically each business could find the potential that finance investors are aiming to lift. For different reasons, that often does not work. It is sometimes

because there is too much reluctance for change; i.e. people in positions where they do not contribute positively to the firm's result.

13. Are there cultural differences between different investors?

➔ Yes, for sure, the differences partly come from the individuals' interests, experiences and preferences, but also from the investment firm's specific philosophy and environment.

The case of company “M”

Data collection

Analysis of the investor – portfolio company relationship of company “M” used both primary and secondary data gained through the company website, the investor website, press releases and articles in magazines. Primary data was gained through one personal interview at top management level at the portfolio company and one interview with the private equity investor who was involved in this deal.

Company background information

Over 100 years old, “M” was founded at the beginning of the 19th century in northeast Germany to produce fire extinguisher equipment. A few years after foundation, the firm was already the world market leader with subsidiaries in other European countries and in the US. Over the years its portfolio was extended continuously. While in the beginning only simple transportable cornet bags and water containers with an integrated pump system were produced, systems for fire fighting vehicles and fixed integrated units were later developed and sold. In the mid 19th century, the company extended its activities with a brand new plant in the southwest of Germany. Twenty years later, expansion continued through the merger with a major German competitor based in Northern Germany, arranged by the company group that then owned “M”.

In the following years, steady expansion followed combined with extensive R&D activity. The most recent milestones were the opening of a new research centre in northern Germany in the late 1990s, which was renovated and extended again in the late 2000s. Two more mergers with competitors in the US followed in 2007 and 2009. Today “M” is once again the world market leader in fire extinguisher equipment with an annual turnover of more than 1 billion EUR and

more than 6,000 employees globally. The product range today includes solutions for all kinds of buildings, machines, industries and vehicles.

The role of technology in company “M”

To be state of the art in all the technologies used and applied by “M” is mandatory for different reasons. On the one hand there is the market requirement for specific product and service characteristics, but then there are the legal requirements and insurance company requirements. Insurance companies often have in place severe clauses regarding fire protection and extinguishing in their insurance contracts, especially for expensive equipment and buildings. Insurance companies are less likely to pay if the customer has not done their utmost to protect their property. “M”'s products and services include sensing technologies to detect smoke or fire, chemicals to extinguish fire quickly and efficiently without causing additional damage (sometimes the damage caused by the extinguishing material is more than the damage from the fire itself), distribution of the extinguishing material, control units and so on. Typically, evolutions from other areas are applied to fire extinguishers. There are few developments made specifically for this branch, but the application of new technology is key to the competitive position.

Ownership structure

From foundation at the beginning of the 19th century, until 1969 “M” was in the sole ownership of the founder’s family. In that year the firm was sold to a large German industrial holding extensively active in the metal sector. After more than 30 years of ownership this holding decided to focus on another sector and as a consequence to cut some companies. One of them was “M”. In 2001 the ownership transferred to a private equity investor for the first time. Just two years later in 2003, the firm was sold again to another private equity investor who kept the business in its portfolio for three years. In 2006, the current owner took over the company. For the whole time the focus was on growth and globalisation, not only from the inside but also from acquisitions.

Interaction with investors

Involvement of the finance investors was mainly in the area of mergers and acquisitions. The involvement of the shareholders in the approval processes depended on the individual company situation, i.e. performance and profitability. When the figures were good and the targets achieved, the C-level management was able to act quite autonomously. This does not mean that reporting was not required, but that the investors saw no reason to intervene. The investor behaviour can be compared to that of parents with a child in school. If the grades are good, the parents allow the child lots of freedom. The child is allowed to act freely within a predefined arena. If however, the child's grades are bad, then the parents might seek to involve themselves directly by helping the child with homework or overcoming blockages in understanding by spending time on explaining difficult concepts. Alternatively, the parents may decide to pay for additional private lessons. Translated into the major shareholders' world, it means that they become active or involved in underperforming portfolio companies as they have the expertise and are able and willing to spend time. The alternative is to acquire 3rd party expertise, typically from expert consultancies.

Findings from the case of company "M"

The investors pushed forward the growth of "M", mainly through mergers and acquisitions. The investor team provided support and involvement in the integration process after the M&As as well as in the identification of synergies, not to mention selection of suitable candidates. Here the investors often came up with proposals provided by third-party companies. To be state of the art or even ahead of the game in technology is a must for the market leader, but this was not a dominant area of influence for the finance investor team. The focus was on the build strategy and on the corresponding financial figures, both top line and bottom line. The involvement of external advisors and consultants was usual, depending on the actual situation of the company.

The outcome of the interviews summarised in brief

1. How often do investor and investee communicate?

→ Exchange is a minimum of once a week depending on the current projects which involve the finance investor. If mergers or acquisitions are planned, the exchange is frequent – often daily. In a “normal” environment however, a weekly call or email exchange can be sufficient, plus monthly reports, which are presented in the personal meetings.

2. Who (position/responsibility) communicates with whom (investor/investee)?

→ The finance investor management team and the C-level team of the portfolio company. Experts from, e.g. finance or R&D, might be involved for specific presentations, such as the annual budget, technology roadmap, etc. Furthermore, external consultants may be involved when 3rd party expertise is required to drive decisions.

3. Which communication methods are used (e.g. email, phone, personal meeting)?

→ Phone and email with the portfolio company C-level team are the most usual methods of communication in terms of frequency. Email is more common for subordinates. A personal meeting is always the preferred option for important issues, with the corresponding attendees all at one table.

4. Are reports made regularly? If yes, what is the rough content of the report (key figures, projects,...) and who prepares/receives it?

→ A standardised report by the portfolio company is submitted to the finance investor each month. The content of this report was agreed by both parties, although the finance investor had a “must be included” list for things such as the book to bill ratio monthly, year to date, turnover, margins and EBIT. Any deviation from the budget potentially raises a question. It is very important to have explanations for negative deviations but also positive ones need to be explained. This is a positive development compared to the past. While historically no one took too much care about the positive deviations, as soon as the investor was on board, there were questions about capacities, market trends and the effects for the rest of the year or next year. The report is on the

one hand an information tool for the shareholder, but at the same time it is also the initiator for discussion that can often result in a mutual decision.

5. Do the asset managers specialise in specific sectors, markets and/or products? If yes, what is the reason/justification (experience, expertise, individual interest,...)?

→ Specialisation may not be the right word. But they do have experience and preferences, yes. This can be related to markets or products, but more often it is related to more general aspects like business size, business situation and the need for action. Experts who have followed a buy and build strategy with success tend to seek similar opportunities again and again. Besides the pure financial benefits that are targeted, it has the potential for creativity and “a game”. But coming back to financials, it can also boost the performance and profitability of a business far beyond the potential of a standalone business.

6. When do investors involve or request 3rd party know-how and/or advice? Who is/can be the 3rd party (specific division of investor, independent consulting company,...)?

→ Third-party consultancies are involved in strategic planning regarding the manufacturing footprint, market penetration, product portfolio and very importantly, the legal or contractual requirements. Besides this, external input, and advice is acquired before mergers and acquisitions are made, not only during the building phase, but also before the platform business is acquired.

7a. How much do investors care about the technology strategy of their portfolio companies?

→ Technology strategy is important and in the context of build strategies, it is important to understand which companies suit each other in the sense that the resulting company value and profitability is higher than the sum of both individual companies. Recommendations however, come more frequently from external advisors or the portfolio company management than the finance investors themselves. In addition, the technology of a portfolio company is considered to be just one parameter of many that contribute to the company value.

7b. If they do influence the technology strategy, on which basis do they do that (legitimation)?

→ A direct influence would be a rare exception. The business is run by the company management and not by the finance investor. Otherwise a salary for the company top management would be a waste of money.

7c. From where do the asset managers receive their information (business analyst?, ...)

→ From external consultancies, the portfolio company top management and the professional network.

8. What is the link / relationship between marketing, organisation, finance strategy influence of an asset manager and technology strategy influence?

→ The build strategy aims to gain market share and to improve the overall market position. At the same time, all M&A activity influences all areas of the business when the acquisitions bring on board full stand-alone businesses. This can have a neutral effect, if the new unit remains independent and isolated. But as soon as departments, functions or activities are merged, the modified starting point has an influence on the target or strategy.

9. Which tools can/do investors use to measure/judge if the technology strategy of a portfolio company will guarantee success in mid to long-term?

→ When a portfolio company is healthy and has a clear line of development through its technology evolution, which has guided the company through different economical environments, then a technology strategy plan presented by the management is far more likely to be accepted. It may be that this depends pretty much on the portfolio company's past, i.e. the reasons for the takeover by the finance investor. When a portfolio company has to be manoeuvred out of a crisis situation, the shareholders will not be able to agree to each and every activity, but will require proof that the proposed actions are the right ones. If a company has been taken over because the previous journey was highly successful and highly profitable, each new influence or disturbance may be seen as something negative. When trust is lacking, it is normal for a

steering committee with people from the portfolio company, from the finance investor and from outside to evaluate new plans or changes in direction.

10a. What opportunities do the investors have to exert influence on their portfolio companies technology strategy?

→ The two most frequently used methods are the installation of personnel selected by the finance investor or the use of veto rights in approval procedures. Both options are frequently chosen, depending on the situation of the individual company. The use of veto rights for investment approval is probably the most frequently occurring blocking point, but also annual budgets often require several revisions before they are approved. An active influence can also be selection by the finance investor of people for the teams who work on future strategy plans.

10b. What are the mechanisms/dynamics of influence? Do managers hide information – if yes/no – why?

→ Influence is exerted mainly through steering or approval committees and through the involvement of third parties. Managers would not usually hide anything, because the reaction of the shareholder is likely to be severe, meaning the manager would most probably be fired immediately. On the working level, some undercover activity might happen, but on the C-level this is unthinkable.

10c. Are all the investors (and asset managers) the same or are there differences between them?

→ The target of all investors is the same – they have cash (or investors to hand who are willing to provide cash) available that they want to invest in the most profitable way possible. Some prefer investments in smaller companies where they can play a more active role while others prefer to buy and sell, depending on the performance of a business. In the case of M, a buy and build strategy was followed successfully for a few years.

11. Is technology strategy indirectly influenced by e.g. budget decisions?

→ Yes, but it does not necessarily mean that a no to an investment proposal coming from a finance investor would be a yes if the approver was e.g. the CEO

of a group company. The general answer is yes, but whether investor involvement actually changes decisions is questionable.

12. Do investors act as consultants concerning technology strategy and organisational learning? If yes, what are the consequences and results?

→ In the case of “M”, investors lead the M&A process, while in the individual businesses they do not push e.g. specific technologies. They work more from the macro point of view.

13. Are there cultural differences between different investors?

→ Some become nervous when the trend of an investment goes in the wrong direction. These investor types can often be a real nightmare for the management because they attempt micro-managing too many details, which is frustrating for the portfolio company management team and slows down progress. Others are cool and act very professionally on the basis of clear analysis and definition of action. The target to increase the company value and to get more out of the investment is the same for all.

The case of company “N”

Data collection

Analysis of the investor – portfolio company relationship of company “M” used both primary and secondary data gained through the company websites, press releases and articles in specific magazines. Primary data was gained through two personal interviews at top management level at the portfolio company and one interview with the private equity investor.

Company background information

The core business of “N” is the production of plastic films for food packaging, electronics, pharmaceuticals, and medical devices. Customised films are also produced as solutions for printing and packaging. The business was founded by a German industrial group, that was previously active in the steel industry as part of a diversification scheme and in response to the growing demand for plastic products in the 1960s. The first operational facility was opened in the mid-west of Germany. Expansion outside Germany started from the late 1970s beginning with the United States of America. Today the company attains a turnover of more than 1 billion EUR with manufacturing sites in 11 countries and more than 3,000 employees. By the mid 1990s, “N” had 2 sites, one in Germany and the other in the US. From that time on, several acquisitions in all regions were made and some joint ventures were founded. This build strategy continues today and continues to be successful. The market share is growing steadily and the global reputation with regards to the product quality and variety is on a high level and still improving.

The role of technology in company “N”

Technology is of high importance to both the product and the process area. At present “N” is world market leader in terms of market share and technology. One of the primary targets is to keep and further strengthen this position with

strategic partnerships and cooperations. All stakeholders have the same priority namely being more efficient in the production process through application of latest available technologies as well as a continuous enlargement and adjustment of the product portfolio.

Ownership structure

From the mid 1960s until 2001, “N” was part of the company group that had founded the business. Over the years the size and product focus of “N” changed permanently through organic growth due to extensive activity in the areas of acquisition and strategic partnerships and last but not least because of portfolio cleansing when parts of the business were sold on. The company has been in the hands of private equity firms since 2001. The first such finance investor kept the business from 2001 until 2007 when he sold it for 2.2 times the purchase price. Today “N” is in the sole ownership of the second private equity investor. The changes in ownership did not impact the direction of the company and the growth and build strategy has been continuously adhered to.

Interaction with investors

The finance investors owning “N” both followed the growth strategy that “N” had defined in the late 1990s when it still was part of a German industrial holding. The global potential of the expansion strategy was a major attraction for both finance investors. While the first investor was satisfied with a return of more than double the original investment, the second investor was convinced that there was much more potential available. The intervention of the investors was mainly aimed at growth and economic sustainability. In other words, it was driven by KPIs, achievement of the targets set by the investors and the competition’s benchmark. The finance investor team is strongly involved in each M&A or JV. The investor team often brings in 3rd parties, e.g. from their professional network or consulting companies that the finance investors consider to be knowledgeable and valuable in the decision making process. The investors are not strongly involved in the day-to-day business and technology

strategy is not an area where they involve themselves too much, but it is an issue that is in the spotlight. In the investment case of “N” the company is a world leader and not just a niche player. Thus permanent product improvement and innovation is vital to keep and further strengthen its position.

Findings from the case of company “N”

In the case of “N”, the private equity investors clearly followed a build strategy, in order to maintain and further strengthen the world market leader position of the portfolio company. Technology is an important factor in achieving this target, especially in the long-term. Thus the technology strategy is of interest to the finance investors, but they do not need to understand fully the strategy and the roadmap drafted by the portfolio company management. If the finance investors are not fully convinced of the validity of the strategy, for whatever reason, they might use either their veto right and allow the portfolio company management time to rework their plan or bring in external advisors. Investors normally do not have the know-how to decide what is the right technology strategy for a company in which they have invested.

They have an idea of the direction in which the company should go, in fact it is more than an idea and normally the result of a detailed pre-investment analysis. Nevertheless, details are not their metier. This is the responsibility of the C-level teams in the portfolio companies. Depending on the actual financial situation of an investment, intervention can come from the investor side to ensure that the financial figures and results remain in a certain corridor, potentially resulting in a direct impact on the technology strategy. If costs do have to be cut, there has to be discussion about how the available resources are allocated. This is often the point when the shareholders and investors discuss technology strategy. Also the M&A activities directly impact the product, project and technology portfolio. This has to be managed and planned at an early stage of the M&A. Besides the immediate effect, this is also very much appreciated by the employees, who in some cases are afraid of job cuts.

The outcome of the interviews summarised in brief

1. How often do investor and investee communicate?

→ Phone calls and emails are exchanged every week for different reasons, usually to inform the investors about specific topics or to ask for approval for investments, projects, etc. Experience shows that close involvement, even if it is not invasive or detailed can avoid frustration later on, when the investor team may criticise something in which they were not involved.

2. Who (position/responsibility) communicates with whom (investor/investee)?

→ From the finance investor side, the asset manager team deals with the communication and depending on the topic a suitable portfolio team. The asset managers from the financial investor and the C-level team of the portfolio company are usually responsible for communication and approval. For any kind of analysis, the portfolio team members communicate directly with the second and third line management of the portfolio company.

3. Which communication methods are used (e.g. email, phone, personal meeting)?

→ Phone and emails are the most frequently used methods (several times a week....), while personal meetings taking place on average monthly.

4. Are reports made regularly? If yes, what is the rough content of the report (key figures, projects,...) and who prepares/receives it?

→ In parallel to the regular exchanges, a monthly report is the rule as private equity investors are on board – in fact a report system was in place for the top managers of the industrial group who owned “N” before, but with each change in ownership the content of the reports changed. At present the most important things are KPIs such as the book to bill ratio, top and bottom line results, complaints, plan/actual comparisons for all budget figures and the top priority projects. The reports are prepared by the portfolio company management and submitted to the asset manager team of the finance investor. The investor’s back office team often come back with specific questions as they usually the ones doing the analysis and number crunching.

5. Do the asset managers specialise in specific sectors, markets and/or products? If yes, what is the reason/justification (experience, expertise, individual interest,...)?

→ Typically, asset managers specialise in markets, product types or business types. But some connection with their personal interests or personal background often becomes apparent when you talk to the people.

6. When do investors involve or request 3rd party know-how and/or advice? Who is/can be the 3rd party (specific division of investor, independent consulting company,...)?

→ Third-party companies are more or less permanently involved in a business the size of "N". Starting from the pre-investment phase to identification of improvement potential and the selection of possible take-over candidates, external advice and expertise is vital for the decision making process. The significance of each and every swing in the business top and bottom line is so great that permanent expenditure on advice is easily justified. The portfolio teams from the finance investor are fully dedicated to supporting the investment. Real third-party involvement normally comes from well-known consultancies, the professional networks of all stakeholders and also from research institutes.

7a. How much do investors care about the technology strategy of their portfolio companies?

→ It is one of the most important areas of a business, as the selection of the right technology is the decisive factor in future success and market position. Active involvement of the investors in that area is not typical, as the expertise panel is the portfolio company management. The investors get involved when it is the time for significant decisions.

7b. If they influence the technology strategy, on which basis do they do that (legitimation)?

→ As mentioned before, involvement does not extend to the investors dictating a certain direction.

7c. From where do the asset managers receive their information (business analyst? ...)

→ From the experts in their own company, from professional networks and from 3rd party consultancies and research institutes.

8. What is the link / relationship between marketing, organisation, finance strategy influence of an asset manager and technology strategy influence?

→ Technology strategy often does play a role when decisions are made regarding organisation, finance or marketing strategy. This is because finance cuts very often impact, e.g. the expenditure approved for advanced engineering projects or HR in general. If there are certain marketing targets, specific customers or markets, technology strategy will have to be adapted, as a kind of complementary function. Organisation is the least related area.

9. Which tools can/do investors use to measure/judge if the technology strategy of a portfolio company will guarantee success in mid to long-term?

→ The portfolio company management has to prepare and present a robust business case that is resistant to questions by the shareholders. When doubts remain, no investment approvals are made. In any case, external expertise in the form of e.g. market studies is always required as well.

10a. What opportunities do investors have to exert influence in their portfolio companies technology strategy?

→ In the cases where the finance investors own 100% or close to 100% of the shares, then of course they can exert influence anywhere and everywhere. Basically it depends on how the finance investors set the rules and where they want to be involved.

10b. What are the mechanisms/dynamics of influence? Do managers hide information – if yes/no – why?

→ Managers have to communicate openly in front of the majority shareholders; otherwise they will be looking for another job in no time at all. Hiding anything would only be an option if the manager is having to leave the company anyhow because of misbehaviour.

10c. Are all the investors (and asset managers) the same or are there differences between them?

→ Besides the mutual objective of increasing value, there are for sure differences. A build and expansion strategy such as the strategy followed by “N” is often found. In the same way however, many investors prefer to buy something that is simply too big and not optimised. In either case the activity will make the companies fit for long-term survival, but the way of achieving this can be different. It can also be said that an investment that is very attractive for one investor, may not be attractive for another. It is linked with the individual expertise, the interest but also on the willingness to take risk.

11. Is technology strategy indirectly influenced by, e.g. budget decisions?

→ Yes, definitely. When times are hard and cash flow is bad, cost cuts are often made even if the effect on important projects is negative. Each business has to run by itself and priorities shift.

12. Do investors act as consultants concerning technology strategy and organisational learning? If yes, what are the consequences and results?

→ Consultant is the wrong word, a better word would be coach. The business still has to be led by the portfolio company management team, but the asset managers will challenge them at each and every opportunity. If the portfolio company C-level team has done its homework and can explain and justify all decisions and actions based on solid and factual analysis, they do not have to be afraid. Any playing of games or action based on guesses will immediately lead to personnel changes.

13. Are there cultural differences between different investors?

→ Everyone wants to earn money. Some try to work in a true entrepreneurial spirit, meaning they want to grow the business or slim it down, because it is the right thing to do. Others just act with a short-term view to make quick profit. The first style is much more challenging and ultimately more satisfying.

Appendix 16 - Summary of tables with key findings per question

1. How often do investor and investee communicate?

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Dominant finance investor involved	No	Yes	No	Yes										
Exchange between finance investor and portfolio company once per month or less	Yes	No	Yes	Yes	No									
Exchange between finance investor and portfolio company several times per month	No	Yes	No	No	Yes									

2. Who (position/responsibility) communicates with whom (investor/investee)?

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Dominant finance investor involved	No	Yes	No	Yes										
Portfolio company CEO leads the exchange from investee side	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other C-level members of the portfolio company are involved occasionally	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes						
Portfolio company members below C-level are involved occasionally	No	Yes	No	No	Yes	Yes	No	No	No	No	Yes	No	Yes	Yes
Asset manager leads the exchange from investor side	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other management members from investor side are involved occasionally (e.g. a defined steering committee)	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes						
Other investor representatives such as portfolio teams are involved occasionally	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes

3. Which communication methods are used (e.g. email, phone, personal meeting)?

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Use of e mail	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Use of p hone	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Use of p ersonal m eedings	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Most frequently used method	e/p	e	p	p	e	e	e/p	e/p	e/p	e/p	e/p	p	e/p	e/p
Preferred method for important topics	pm	pm	pm	p	pm									

4. Are reports made regularly? If yes, what is the rough content of the report (key figures, projects,...) and who prepares/receives it?

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Dominant finance investor involved	No	Yes	No	Yes										
Regular reporting is made	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reporting is designed according to finance investor request (specific KPIs)	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes

5. Do the asset managers specialise in specific sectors, markets and/or products? If yes, what is the reason/justification (experience, expertise, individual interest...)?

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Activity of portfolio company (products, markets...) the reason for selection by the asset manager	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes
Portfolio company size/legal form/actual performance was the reason for selection by the asset manager selection	No	No	No	No	No	No	Yes	No	Yes	No	No	Yes	Yes	No

6. When do investors involve or request 3rd party know-how and/or advice? Who is/can be the 3rd party (specific division of investor, independent consulting company...)?

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Dominant finance investor involved	No	Yes	No	Yes										
Third-party expertise is used in the pre-investment phase	Yes	Yes	No	Yes										
Third-party expertise is used for specific business cases involving e.g. new markets, new technology or to generally improve the company performance	No	Yes	No	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes

7a. How much do investors care about the technology strategy of their portfolio companies?

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Finance investor interested in technology strategy and considers it to be a key area for the company market position and value	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Finance investor wants to be involved in the decision making process regarding technology strategy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Technology strategy is one of the main areas watched by the finance investor in the investment phase	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Finance investor wants to steer the direction of the technology strategy	No	No	No	No	No	No	No	No	No	No	No	No	No	No

7b. If they influence the technology strategy, on which basis do they do that (legitimation)?

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Do finance investors consider themselves or people from their teams to have the expertise or legitimation to steer technology decisions	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Do finance investors verify (w or w/o external support) the alignment of a technology strategy proposed by the portfolio company management with the investor targets	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

7c. From where do the asset managers receive their information from (business analyst?, ...)

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Asset manager is strongly supported by back office analysts	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	Yes
Asset manager is strongly supported by a whole portfolio team	Yes	Yes	No	No	Yes	No	No	No	No	Yes	Yes	No	No	Yes
Third-party consultancies are utilised	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Valuable input comes from the asset manager network	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

8. What is the link / relationship between marketing, organisation, finance strategy influence of an asset manager and technology strategy influence?

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Dominant finance investor involved	No	Yes	No	Yes										
Technology strategy is influenced by finance investor involvement in finance driven decisions	No	Yes	No	Yes										
Technology strategy is influenced by finance investor involvement in marketing decisions	No	Yes	No	Yes										
Technology strategy is influenced by finance investor involvement in organisation specific decisions	No	Yes	No	Yes										

9. Which tools can/do investors use to measure/judge if the technology strategy of a portfolio company will guarantee success in mid to long-term?

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Do specific tools exist to evaluate technology / technology strategy of a portfolio company	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Technology / technology strategy is evaluated in the context of an overall business case (including financial parameters)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

10a. What opportunities do investors have to exert influence on their portfolio companies technology strategy?

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Percentage of ownership would allow the finance investor to dictate a certain technology strategy	No	Yes	No	Yes	No									
Technology strategy is dictated by finance investor	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Technology strategy is indirectly influenced by finance investor (see question 8)	No	Yes	No	Yes										

10b. What are the mechanisms/dynamics of influence? Do managers hide information - if yes/no - why?

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Can (and do) portfolio company managers influence directions of action by "adjusting" the specification of information packages	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

10c. Are all the investors (and asset managers) the same or are there differences between them?

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Investor focuses on companies with specific parameters (e.g. SMEs just out of insolvency...)	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes
Investor doing fundamental re-organisation of companies (buy and build, build and burst...)	No	No	No	No	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes
Personality and experience of asset managers impacts their course of action	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

11. Is technology strategy indirectly influenced by e.g. budget decisions?

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Technology strategy is influenced by finance investor involvement in finance driven decisions	No	Yes	No	Yes										
Technology strategy is influenced by finance investor involvement in marketing decisions	No	Yes	No	Yes										
Technology strategy is influenced by finance investor involvement in organisation decisions	No	Yes	No	Yes										

12. Do investors act as consultants concerning technology strategy and organisational learning? If yes, what are the consequences and results?

OBSERVATION	CASE													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Investors act as consultants for organisational learning	Yes	Yes	No	Yes										
Investors act as consultants for technology strategy	No	No	No	No	No	No	No	No	No	No	No	No	No	No

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