An Empirical Analysis of Labour, Education and Health Related Policies in Indonesia

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A Thesis submitted for the degree of

Doctor of Philosophy in Economics

March 2020

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Declaration

I hereby declare that this PhD thesis entitled "Empirical Analysis of Labour, Education and Health-related policies in Indonesia" is a presentation of my original research for the degree of Doctor of Philosophy in Economics with guidance from Professor Nils Braakmann, Professor John Wildman and Dr Barbara Eberth. All chapters are solo-authored by me with feedback from my supervisors.

Acknowledgements

In the name of Allah, the Most Gracious and the Most Merciful. First and foremost, praise to Allah the Almighty, without whose grace and will, I would not be able to complete the PhD journey.

I would like to express my special appreciation and thanks to my supervisors Professor Nils Braakmann, Professor John Wildman and Dr Barbara Eberth, for the guidance and support. I appreciate all their contributions of time, ideas, and feedback, which was invaluable and stimulating. They have been supporting not only concerning the completion of the research but also in my academic life in Newcastle.

Also, I would like to thank the National Team for Acceleration of Alleviation (TNP2K) in the Vice President Office of Republic of Indonesia Dr Elan Satriawan and Ekki Syamsulhakim, for providing me the latest wave of PKH data before it was published. I am also indebted to Professor Benjamin Olken for the help and advice, to the seminar participants at the International Association for Feminist Economics (IAFFE) annual meeting in New York University-New Paltz; Lancaster Summer School in Lancaster University; Royal Economic Society (RES) annual meeting in University of Warwick; Dr Carolina Caetano, my mentor in Midwest Econometrics Group (MEG) Mentoring in MEG annual conference at Ohio State University; and Econometric Society Meeting of Latin American at Benemerita Universidad Autonoma de Puebla, Mexico, for the helpful comments and feedback on my empirical work.

Moreover, I would like to express my sincere gratitude to my late parents, their unconditional love and support had been the source of inspiration and encouragement before and during my PhD journey. Special thanks to my husband, who has been a constant support during the challenging PhD years. I am also really blessed with and grateful to have my three children as the source of encouragement and amusement during these years.

The PhD research was sponsored by Indonesia Endowment Fund for Education (LPDP) managed by the Indonesian Ministry of Finance.

Abstract

The thesis investigates the impact of the Indonesian Government's policies related to labour, education and health. The thesis consists of three empirical analyses: first, an examination of the impact of a household conditional cash transfer programme on female labour participation; secondly, an investigation of the effects of the nine-year compulsory schooling law enactment on educational and work outcomes; and finally an examination of the impact of the national programme of community empowerment on community participation and health facilities utilisation and health outcomes. The research employs econometric methods including difference-in-differences, instrumental variable and regression discontinuity design: it uses data from two large-scale randomised controlled trials (RCT), data from the household cash transfer programme and community empowerment programme and Indonesia Family Life Survey Data (IFLS).

The thesis reveals that the household conditional cash transfer programme does not have an impact on female labour participation. The CCT programme did not motivate the women to work, and two years after its implementation it had not discouraged working in the short run. Six years after its implementation there was a significant reduction in female labour participation using IV estimation. The effects of nine-year compulsory schooling law were investigated by employing a regression discontinuity design. The results show that the compulsory schooling law has an impact on educational attainment in the fraction of people completing at least nine years of schooling. In terms of work outcomes, the policy has a significant effect on the likelihood of working in the formal sectors, but no effect on monthly wages.

Lastly, this thesis evaluates the effects of the Generasi, a national programme of community empowerment, on community participation and health outcomes. The results from Generasi community empowerment programme suggest that the programme does not have an impact on the village decision-making process for community self-help activities. The programme does not have an impact on the quality of health facilities as measured by the availability of health personnel in a village. The programme suggests a marginally significant positive effect on mothers' health knowledge. Despite the effect on mothers' health knowledge, the programme does not have an impact on health facilities use for mothers. The empirical results for children suggest that the programme had significant positive effects on child

visits to the Posyandu, the monthly health clinic, and whether nutritious meals were served during Posyandu sessions. However, the programme does not suggest any effect on children health outcomes.

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List of Abbreviations

Aseskin	*Asuransi Kesehatan Masyarakat Miskin* (Health Insurance for the poor)
Bappenas	*Badan Perencanaan Pembangunan Nasional* (National Development Planning Agency)
BPS	*Badan Pusat Statistik* (National Statistics Agency)
Bupati	District head
BW	Bandwidth for regression discontinuity
Camat	Subdistrict head
Clustered-RCT	Clustered randomised control trial
Desa	Rural village
D3	Diploma-3, 3 years vocational college degree
D4	Diploma-4, 4 years vocational college degree, equivalent to bachelors degree
KDP	*Kecamatan* (Subdistrict) Development Program
Kelurahan	Urban village
Kemenkes	*Kementrian Kesehatan* (Indonesias Ministry of Health)
DKI	*Daerah Khusus Ibukota* (Special Capital Territory)
IFLS	Indonesia Family Life Survey
Jamkesda	*Jaminan Kesehatan Daerah* (regional health insurance scheme)
Jamkesmas	*Jaminan Kesehatan Masyarakat* (health insurance scheme)
GDP	Gross Domestic Product
Kabupaten/Kota	District/Municipal
Kecamatan	Subdistricts
Kades	*Kepala desa* (desa leader)
Kejar paket A	*Paket Belajar A* (learning package materials for primary school test)

Kejar paket B . . . *Paket Belajar B* (learning package materials for junior secondary school school test)

Kejar paket C . . . *Paket Belajar C* (learning package materials for senior secondary school school test)

NTT . . . . . *Nusa Tenggara Timur* (East Nusa Tenggara province)

PKH . . . . . *Program Keluarga Harapan* (Family of Hope program, Household CCT)

PMT . . . . . Proxy-means test for asset screening

PNPM Generasi . *Program Nasional Pemberdayaan Masyarakat Generasi Sehat-Cerdas* (National Program for Community Empowerment Healthy and Smart generation, Community CCT)

PODES . . . . . *Potensi Desa* (Survey Village Potential)

Polindes . . . . . *Pondok Bersalin Desa* (village midwife)

Posyandu . . . . . *Pos pelayanan terpadu* (Monthly community-provided health service facility)

PPLS . . . . . *Pendataan Program Perlindungan Sosial* (Data Collection for targeting Social Protection Program)

Puskesmas . . . . . *Pusat kesehatan masyarakat* (Community/Sub-district health centres)

Pustu . . . . . *Puskesmas Pembantu* (Supporting Community/Sub-district health centres)

Raskin . . . . . *Beras miskin* (subsidized rice for the poor)

rdbwselect . . . . . regression discontinuity optimal bandwidth selection Stata command

Riskesdas . . . . . *Riset Kesehatan Dasar* (Basic Health Survey) conducted by the Indonesian Ministry of Health

RT . . . . . *Rukun Tetangga* (Neighbourhood head)

RW . . . . . *Rukun Warga* (Hamlet head)

RTSM . . . . . *Rumah Tangga Sangat Miskin* (extremely poor household)

RSUD . . . . . *Rumah Sakit Umum Daerah* (District-level public hospital)

SD . . . . . *Sekolah Dasar* (Primary school)

SMP . . . . . *Sekolah Menengah Pertama* (junior secondary school)

SMA . . . . . *Sekolah Menengah Pertama* (senior secondary school)

SMK . . . . . *Sekolah Menengah Kejuruan* (vocational senior secondary school)

SUSENAS . . . . . *Survei Sosial Ekonomi Nasional* (National socio-economic survey).

UP-PKH . . . . . *Unit Pelaksana* PKH (PKH CCT implementation unit)

1 Introduction

1.1 Research aims

One of the most effective ways for a country to alleviate poverty is by breaking the poverty chain between generations through increasing consumption and inducing investment in human capital which comprises education and health (Barrientos and DeJong 2004, Fiszbein et al. 2009). One of the central approaches to advance economic development is through investment in human capital (Schultz, 1961; Becker, 1964; Colclough, 1982). This approach can be achieved by improving the education and health status of the people. The Indonesian Government has implemented several programmes, including social safety net, energy subsidy and conditional and unconditional cash transfer to alleviate poverty.

The thesis aims to investigate the impact of labour, education and health-related policies in Indonesia by applying econometrics methods using data on Indonesia. The data comprises the household conditional cash transfer programme (PKH), national programme of community empowerment (PNPM Generasi), and Indonesia Family Life Survey (IFLS). The findings of this study are important in adding to the literature the analysis of the Indonesian Government's investment in human capital and to inform for future policy making.

The research makes three main contributions. First, chapter 4 contributes to the literature regarding the analysis of household conditional cash transfer (CCT) programme impact on female labour participation. Chapter 5 investigates the causal effects of compulsory education on educational attainment and work outcomes later in life. Chapter 6 focuses on evaluating the impact of Generasi community empowerment programme on community participation, health facilities utilisation and the health outcomes of mothers and children.

Indonesia is a developing country in South East Asia, currently the fourth most populous nation in the world. Indonesia has a population of 266 million with more than 300 ethnicities living in 34 provinces (World Bank, 2019). Indonesia's GDP is currently the 16th largest globally, it is also a member of the G20. The level of GDP is US$ 1.01 trillion with a GDP per capita of US$ 3,877, which classifies Indonesia as an upper-middle income country (World Bank, 2019). In the last two decades, the economy has improved by shifting from oil-based export to more diverse products, from raw materials to manufacturing and financial services sectors. Indonesia has been successful in reducing poverty through national poverty alleviation programmes, which reduced the poverty rate by more than half since 1999, from 24% to 9.8% in 2018 (World Bank, 2018). Despite the improvement in macroeconomic indicators and poverty, the socioeconomic gap was still wide. Hence, the Indonesian Government initiated several social assistance programmes in 2007. The country's long-term development plan focuses on infrastructure development and social assistance programmes related to education and healthcare.

This thesis aims to answer the following research questions:

- Does Indonesia's conditional cash transfer programme have an impact on female labour participation?
- Does the nine-year compulsory education policy have effects on educational and work outcomes?

- Does Indonesia's National Programme of Community Empowerment have any impact on community participation, health facilities utilization and health outcomes?

The objectives of the household CCT are to reduce maternal mortality and to provide the beneficiaries access to public healthcare services and universal basic education. It is important to measure the unintended impact of household CCT on female labour participation. One of the features of Indonesian household CCT is that the transfer is given to and managed by an adult female in the qualifying household, which might have implications on women empowerment and their labour supply decision. The CCT impact on female labour supply is analysed using static labour supply theory. An increase in non-labour income increases demand for leisure and thus reduces labour supply or income effect (Blundell and MaCurdy, 1999). The cash transfer is an unearned income which might reduce labour supply through the income effect. Given the nature of the program, female decision making on how to spend the money becomes very crucial in achieving the programme objectives (Attanasio and Lechene, 2002).

A study in Mexico, Honduras, and Nicaragua indicated that the effects of the CCT programmes on adults labour participation were negative, small and insignificant (Alzua et al. 2013). Although the transfers were substantial in size, the programmes did not reduce the labour supply in the short-run. There were additional findings for the Mexican Progresa, which indicated a small positive effect on the work hours of female beneficiaries and an increase in household labour income two years after the programme implementation (Alzua et al. 2013). The impacts could be attributed to the changes in the adults' labour supply in eligible households and to the increased available time of women as a result of higher children school enrollment rates (Alzua et al. 2013).

The second study examines the effects of compulsory schooling extension in Indonesia on work outcomes. The causal effects of education on work outcomes have been well documented (Angrist and Krueger, 1991; Behrman and Deolalikar, 1993; Card, 1999; Acemoglu and Angrist, 2000; Duflo, 2001; Oreopoulos, 2006). Better education can increase the likelihood to work for pay and earn higher income. However, examining the causal impact of education on work outcomes is not an easy task. There is endogeneity of unobservable associated with education which might also affect work preferences. The study exploits the exogenous variation in the likelihood to complete at least nine years of schooling and work outcomes by the change in compulsory schooling law in Indonesia enacted in 1994 as a source of identification. Currently, few studies evaluated the impact of compulsory education in developing countries. Several studies examined the impact of longer school year implemented in all education levels in Indonesia and the impact of large school construction project in 1970s, but none has examined the impact of Indonesia's free nine-year compulsory schooling on working outcomes. Duflo (2001) investigated the impact of Indonesia's school construction programme between 1974 and 1978 and found that each constructed primary school per 1000 children resulted in 0.12 to 0.19 years average increase in education and between 1.5 and 2.7 percent increase in wages.

Oreopoulos (2006) examined the effect of school-leaving age laws on educational attainment and earnings and compared the returns to compulsory schooling for the United States, Canada and the United Kingdom using OLS, IV-Difference-in-Differences and IV-Regression Discontinuity. The findings suggest that the compulsory schooling has large impact between ten and 15 percent increase in earnings on both the majority and minority groups who were exposed to the policy.

The Indonesian nine-year compulsory schooling policy mandated children to stay at school for at least nine years, prior to 1994 children were only required to complete six years of schooling. This study applies a fuzzy regression discontinuity

design which exploits the compulsory schooling law enactment as an exogenous variation. A fuzzy regression discontinuity design is used because the treatment to completing nine years of schooling is not deterministic. Completing nine years education is not deterministic since the compulsory schooling policy in Indonesia means that the government is responsible to provide free basic education for all the people. However, there were no strict measures to enforce the policy, with no minimum attendance requirement either. The pupils and parents may decide not to abide with the policy without apparent consequences.

Lastly, this thesis investigates the impact of a National programme of Community Empowerment, PNPM Generasi health programme, on the community participation, quality of community health facilities, utilisation of healthcare facilities, and health outcomes of mothers aged 16 to 49 and children aged 0 to 36 months. PNPM Generasi health programme was aimed to address the Millenium Develpment Goasls (MDGs) of reducing poverty, maternal mortality and child mortality, to achieve universal coverage of basic education, through improving the health services and education services in the Generasi programme areas. The PNPM Generasi programme was implemented at a village level. The data employed are village-level data, household and individual-level data on mothers and children, health personnel and healthcare facilities data. Health personnel data includes midwives and Posyandu cadres characteristics data. Institutions characteristics and facilities data include villages and subdistrict community health centres. Generasi programme impact is estimated using difference-in-differences specification.

1.2 Structure of the Thesis

The thesis comprises seven chapters, an introductory chapter which introduces the research and institutional context, a chapter on Indonesia country profile, data

and descriptive statistics, three chapters of empirical work and conclusions chapter. The thesis is organised as follows:

Chapter 1 establishes the research background and outlines the structure of the thesis.

Chapter 2 introduces Indonesia's country profile including health and socio-demographic profiles, and provides the institutional background of the policies discussed.

Chapter 3 describes the datasets and the variables employed in the research and empirical analysis. The chapter also illustrates the data in the descriptive statistics.

Chapter 4 investigates the impact of programme Keluarga Harapan, PKH, the household conditional cash transfer programme on female labour participation as the programme indirect impact. Empirical strategies utilised are difference-in-differences and instrumental variable techniques.

Chapter 5 evaluates the effects of Indonesia nine-year compulsory education law enacted in 1994 on educational attainment and work outcomes later in life. Using regression discontinuity design, this study exploits the change in compulsory schooling law in Indonesia enacted in 1994 as a source of identification.

Chapter 6 investigates the impact of National programme of Community Empowerment, a village block grant, on community participation, the quality of health providers, health facilities utilisation and health outcomes by employing difference-in-differences. Furthermore, it investigates the relevance of political economy implication on village budget allocation.

Chapter 7 summarises, interpret the findings from empirical chapters and concludes the thesis. Finally, it discusses the implication of the policy in a broader context and opportunity for further research.

2
Country Profile

This chapter provides Indonesian country profile as institutional background which serves overview to the results findings. First, it describes the economic growth and Gross Domestic Product (GDP) followed by the labour situation which describes the labour force participation of male and female, the gender gap and types of employment. Subsequently, the chapter discusses Indonesian education system, enrolment rate and educational attainment of its people followed by health situation. Lastly, it discusses the village government.

2.1 Indonesian Economy

Currently, Indonesia's GDP at nominal of US $ 1.06 trillion is the 16th largest and the seventh in the world in terms of gross domestic product (GDP) at purchasing power parity (IMF, 2016). Figure 2.1 shows Indonesia's GDP levels in current US$ billions over the last 18 years. Indonesia's GDP had increased substantially from US$ 165 billion in 2000 to US$ 893 billion in 2011, then increased to US$ 1.01 trillion in 2018.

Figure 2.2 depicts the levels of GDP of the largest 20 world economies in 2018 which ranks Indonesia as the 16th. Figure 2.3 shows GDP per capita in current

Figure 2.1: Indonesia's GDP over the last 20 years

and at purchasing power parity (PPP) constant using 2011 price, over 18 years period. Indonesia's GDP per capita has increased steadily within the last two decades both at current and constant price with a small decrease between 2012 and 2015. The GDP per capita PPP had increased considerably from US$6,000 in 2000 to US$ 8,000 in 2010. In 2018, the GDP PPP at constant price is US$ 12,000 (World Bank, 2019).

Table 2.1 presents the GDP by components in 2017 and 2018. Household consumptions share was 57% of GDP and government expenditure accounted share was 9% of GDP. Investments, exports and imports share were 34%, 21% and 22%, respectively.

Table 2.2 presents the GDP share by sectors in 2017 and 2018. The top five shares of GDP are the manufacturing sector, 20.7%, followed by wholesale and retail trade, 13.5%, agriculture, forestry and fishing, 13.3%, construction, 11%,

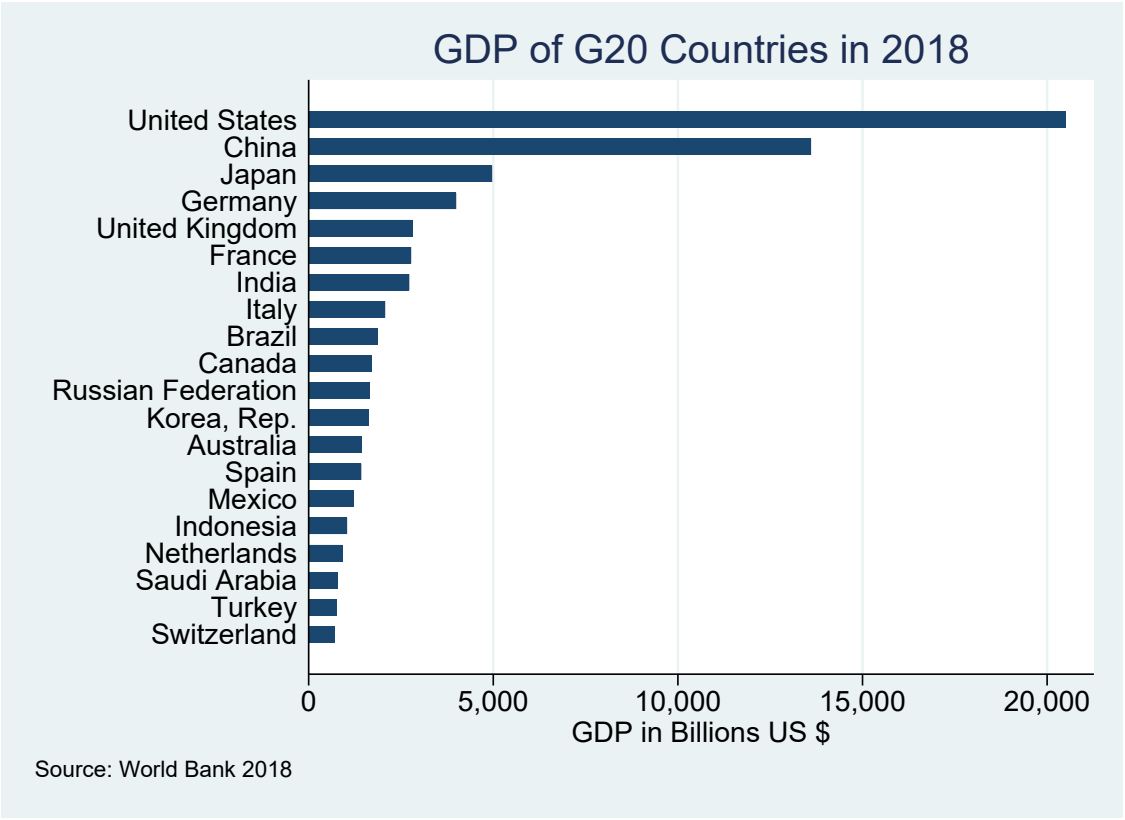

Figure 2.2: GDP among G20 Countries

and mining and quarrying, 8.4%. The rest sectors made up 33% of GDP.

Figure 2.4 shows the share of GDP by islands, with Java had the highest share of 58.5%, followed by Sumatra (21.6%), Kalimantan (8.2%), Sulawesi (6.2%), Bali and Nusa Tenggara, and Maluku and Papua (2.5%). Java island has highest population and the most developed region with manufacturing industries, business and financial services. Whereas Sumatra and Kalimantan are still dominated by agro-industry and mining.

Figure 2.5 depicts the government budget by sectors in 2019. The total budget is 1,600 trillion rupiah. The highest sector share is general public services (32%) followed by economics affairs (24%). The share of social protection programme budget is 12.3%. The social protection includes the conditional cash transfer programme, PKH, health insurance subsidy, rice and food subsidy for the poor, education assistance and community empowerment programme. The fourth highest

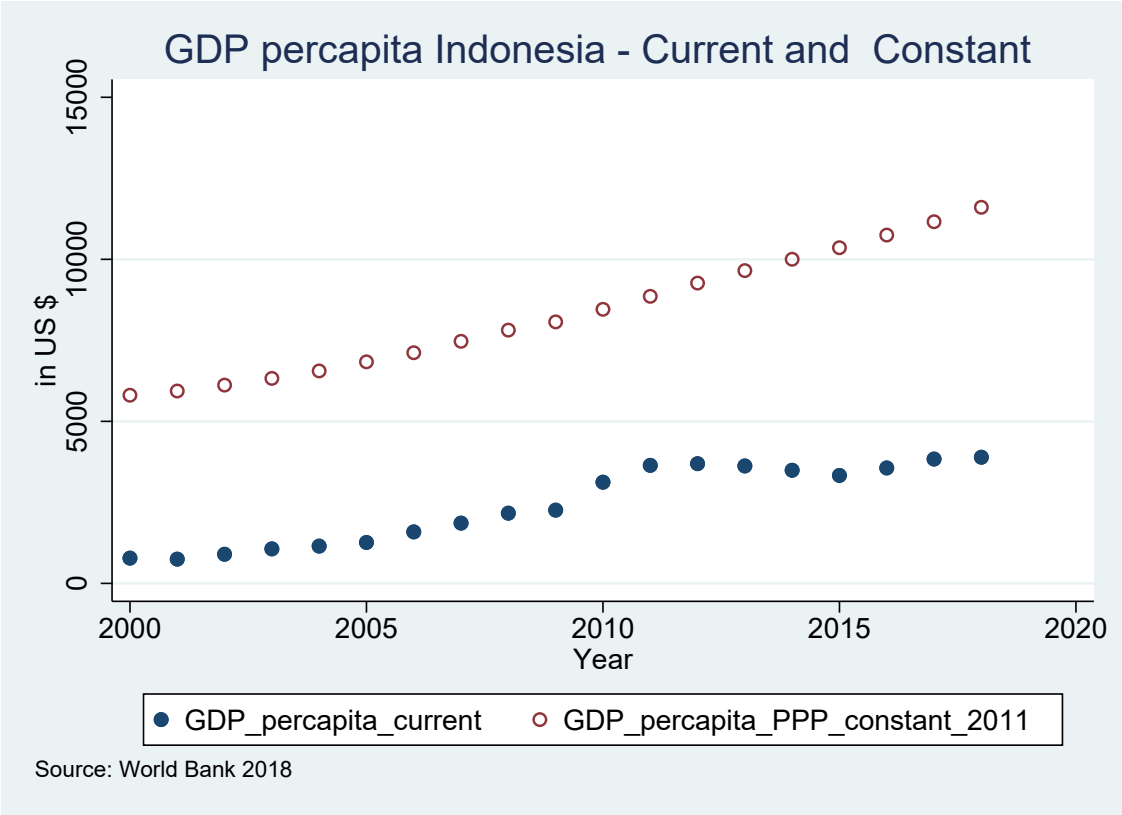

Figure 2.3: Indonesia's GDP per capita

Table 2.1: GDP Expenditure by Components

Type of Expenditure	Year 2017 (Trillions IDR)	Year 2018 (Trillions IDR)	Share 2017 (Percent)	Share 2018 (Percent)
Private Expenditure (households)	7,788.2	8,450.6	57.3	57.0
Government Expenditure	1,234.6	1,332.5	9.1	9.0
Investments	4,581.2	5,129.2	33.7	34.6
Export of Goods and Service	2,743.1	3,110.8	20.2	21.0
Imports of Goods and Service	2,605.2	3,272.5	19.2	22.1
adjustment	-154.7	86.8	-1.1	0.6
Gross Domestic Product (GDP)	13,587.2	14,837.4	100.0	100.0

Note:
Source: BPS, 2019

Table 2.2: GDP Expenditure by Sectors

GDP by Sectors	2017 (Trillions IDR)	2018 (Trillions IDR)	Share 2017 (Percent)	Share 2018 (Percent)
Agriculture, Forestry and Fishing	1,787.3	1,900.4	13.68	13.35
Mining and Quarrying	1,029.6	1,199.0	7.88	8.42
Manufacturing	2,739.7	2,947.3	20.97	20.70
Electricity and Gas	162.4	176.4	1.24	1.24
Water and Waste Management	9.4	10.0	0.07	0.07
Construction	1,410.5	1,562.3	10.80	10.97
Wholesale and Retail Trade	1,768.9	1,931.9	13.54	13.57
Transportation and Storage	735.2	797.3	5.63	5.60
Accommodation and Food	386.9	412.5	2.96	2.90
Information and Communication	513.7	559.1	3.93	3.93
Financial and Insurance	571.2	616.3	4.37	4.33
Real Estate	382.5	406.6	2.93	2.86
Business	238.2	267.1	1.82	1.88
Public Administration and Defence	498.2	541.7	3.81	3.81
Education	446.3	482.1	3.42	3.39
Human Health and Social Work	144.6	157.9	1.11	1.11
Others	239.3	268.6	1.83	1.89
Gross Value Added	13,063.9	14,236.5	100.00	100.00
Tax	523.3	600.9		
Gross Domestic Product (GDP)	13,587.2	14,837.4		

Note:
Source: BPS, 2019

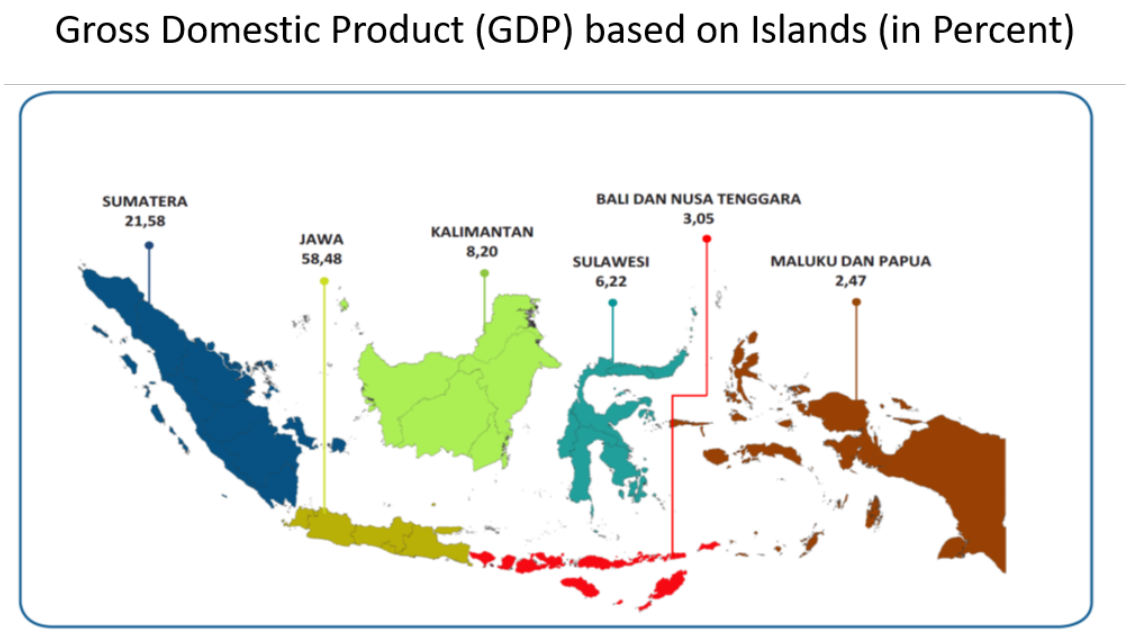

Figure 2.4: Indonesia's GDP by Islands

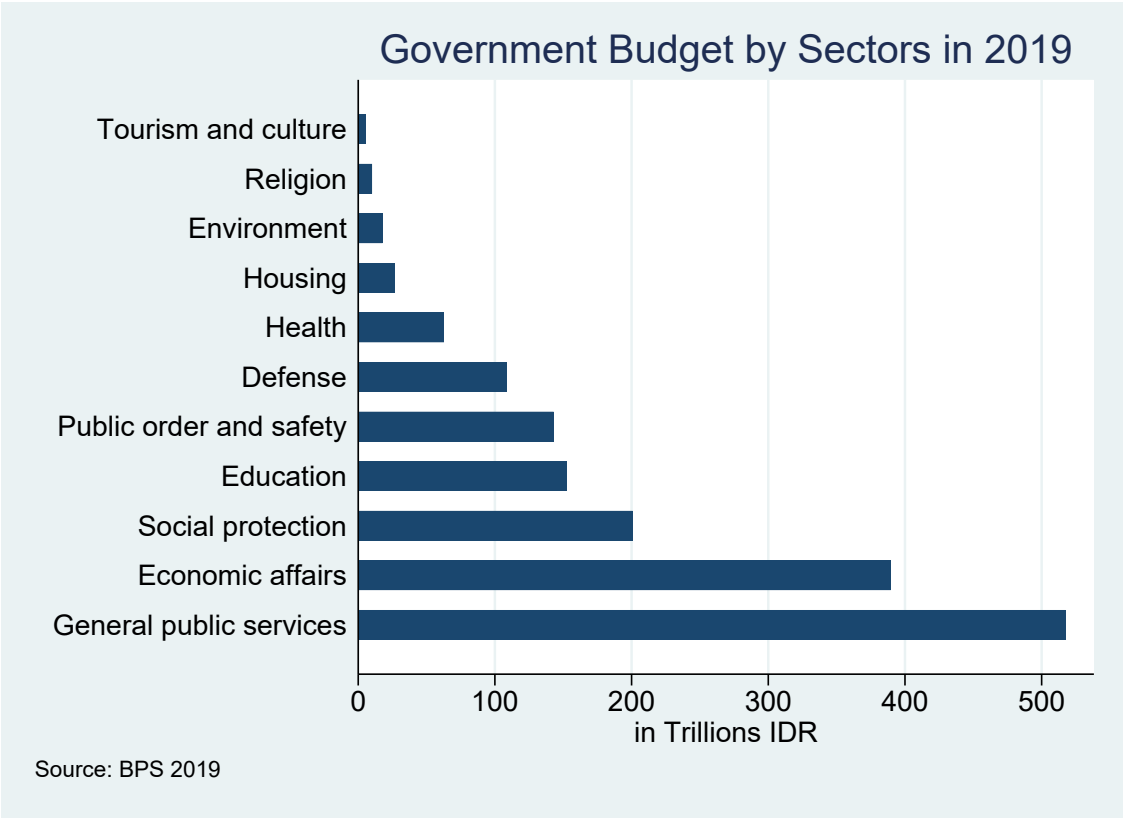

Figure 2.5: Government Budget Based on Sectors

share of 9.3% is allocated to education sector followed by health sector, 4%.

Figure 2.6 presents the top ten export products in 2018. The figure shows that Indonesia's top ten exports worth 62.6% of Indonesia's total exports in 2018. Indonesia shipped US$180.2 billion worth of goods around the globe in 2018. Around 72% of Indonesian exports value were delivered to neighbouring Asian countries. About 11.3% were sold to North American customers followed by European importers at 10.6%. Smaller percentages were shipped to Africa (2.6%), Australia and Oceania importers (2%) and to Latin America (1.5%).

Figure 2.7 shows that Indonesia's top 10 imports US$ 188.7 billion worth of goods from other coutries in 2018. Indonesian imports represent approximately 1.1% of total global imports with the amount of US$17.788 trillion in 2017. Around 74.9% of Indonesia's value of total imports in 2018 were purchased from neighbouring Asian countries. European nations supplied 9.5% while 6.5% worth of

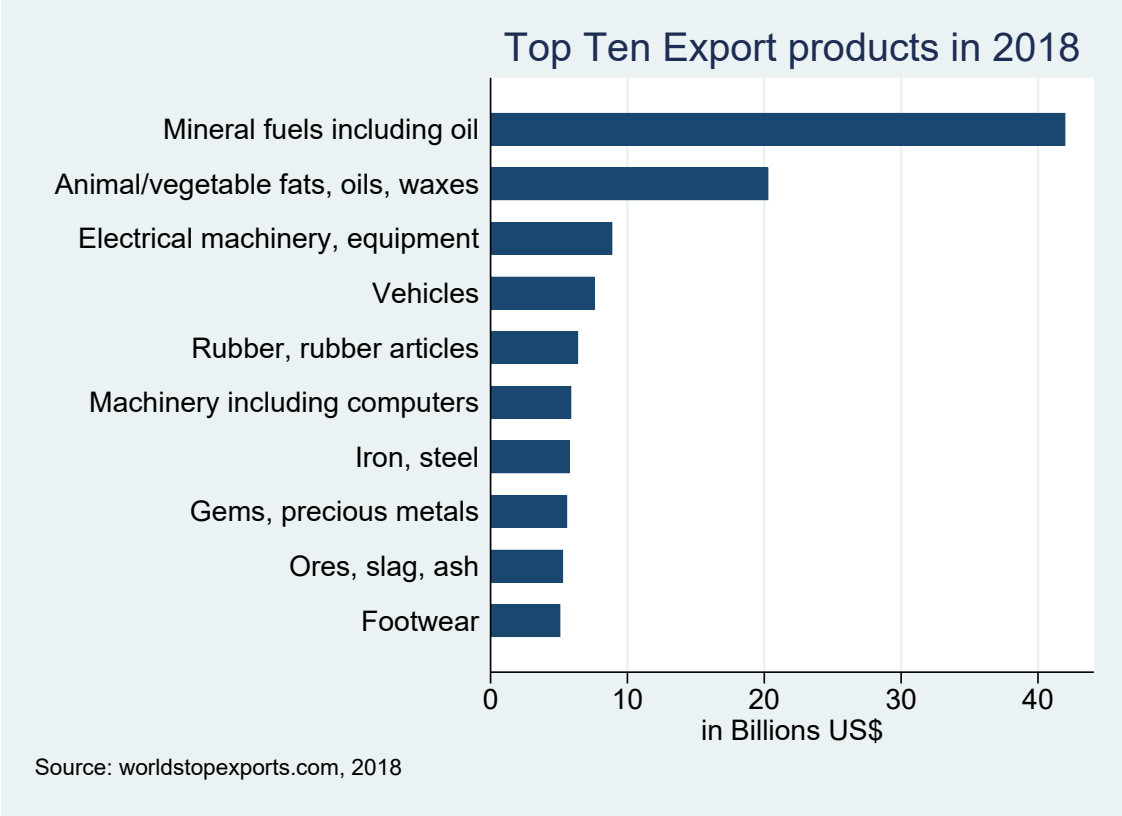

Figure 2.6: Top Ten Export Products

goods originated from North America. Smaller percentages of overall Indonesian imports came from Australia and Oceania (3.6%), Africa (3.4%) and from Latin America (2%).

Figure 2.8 presents the economic growth and inflation rates outlook in ASEAN countries for 2019. Indonesia's GDP growth is projected the same as previous year, 5.1%. Compared to other ASEAN countries, Indonesia's growth rate is moderate. Indonesia still has positive real economic growth.

2.2 Labour

There has been a substantial gender gap in labour force participation between men and women since early 1990s. Figure 2.9 shows that male labour force participation has been stable and almost twice as much that of female. Male labour force participation has been steady above 80%, while female labour force

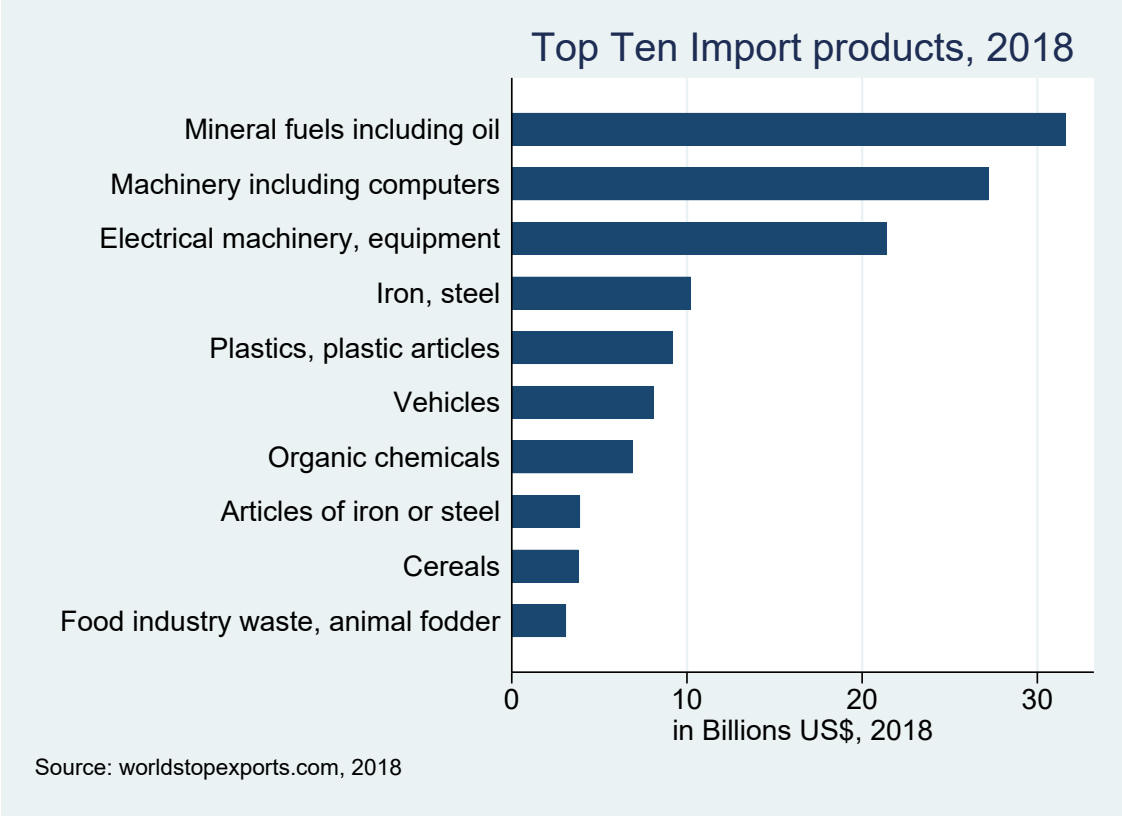

Figure 2.7: Top Ten Import Products

participation had increased steadily from 45% to 50% between years 1990 and 1998. The rate fell again to 45% in 2005 and increased steadily to 52% in 2017. There is gender gap in terms of formality, vulnerability, wages, and labour force participation. The gender gap is contributed by education, job, time, and gender discrimination (ILO Jakarta Office, 2013). Indonesia ranked 97th out of 142 countries with 0.67 gender parity (out of 1) according to the Global Gender Report (2014). Its low performance was shown by the increase in the gender-gap in labour force participation above 30 percent from early 1990s which peaked to 37 percent gap in 2006. This gender gap in labour participation reveals the limited link of economic outcomes on women empowerment. However, this fact is in line with the narrative of structural transition faced by countries as they progress through the stages of development. In the first stage, both men and women are forced to engage in economic activity, mainly in the primary sector due to low household

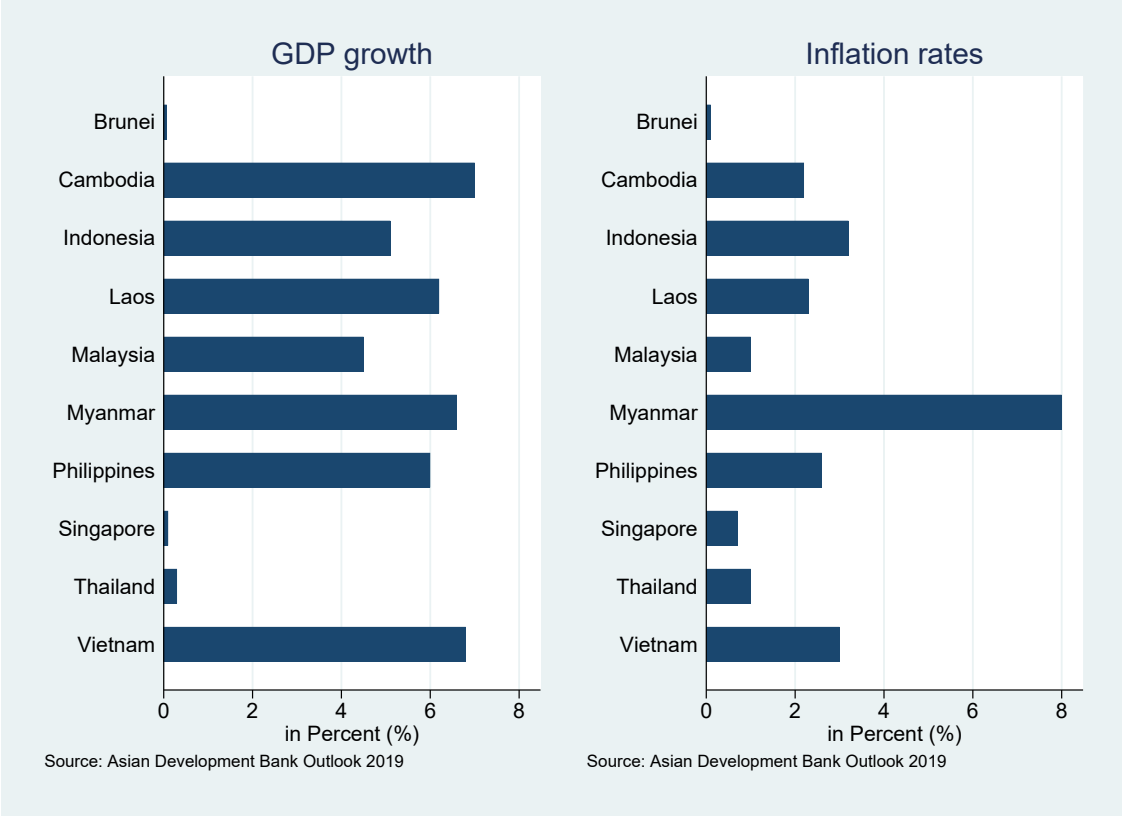

Figure 2.8: GDP Growth and Inflation in ASEAN Countries

incomes. Later, as the economy moves from agrarian to manufacturing sector, women withdraw from the labour force to take care of domestic responsibilities due to a lack of social infrastructure (Mammen and Paxson, 2000).

Unemployment rates in Indonesia were relatively low until 1997 when the monetary crisis struck. Figure 2.10 shows that unemployment rate was 2.5% in 1991 and increased to 4.6% in 1997. In 1999, the unemployment rate remained high at 6.3% and continued to increase and peaked at almost 8% in 2005. After the crisis, job creation in lndonesia's labour-intensive manufacturing industries generation declined in 2005 more than before the crisis (Aswicahyono et al, 2011). The unemployment rate decreased again to 6% in 2009 and continued to decrease to slightly above 4% in 2018.

The unemployment rate by gender is depicted in Figure 2.11. The gap between female and male unemployment widened from 1994 to 1997 with female unemploy-

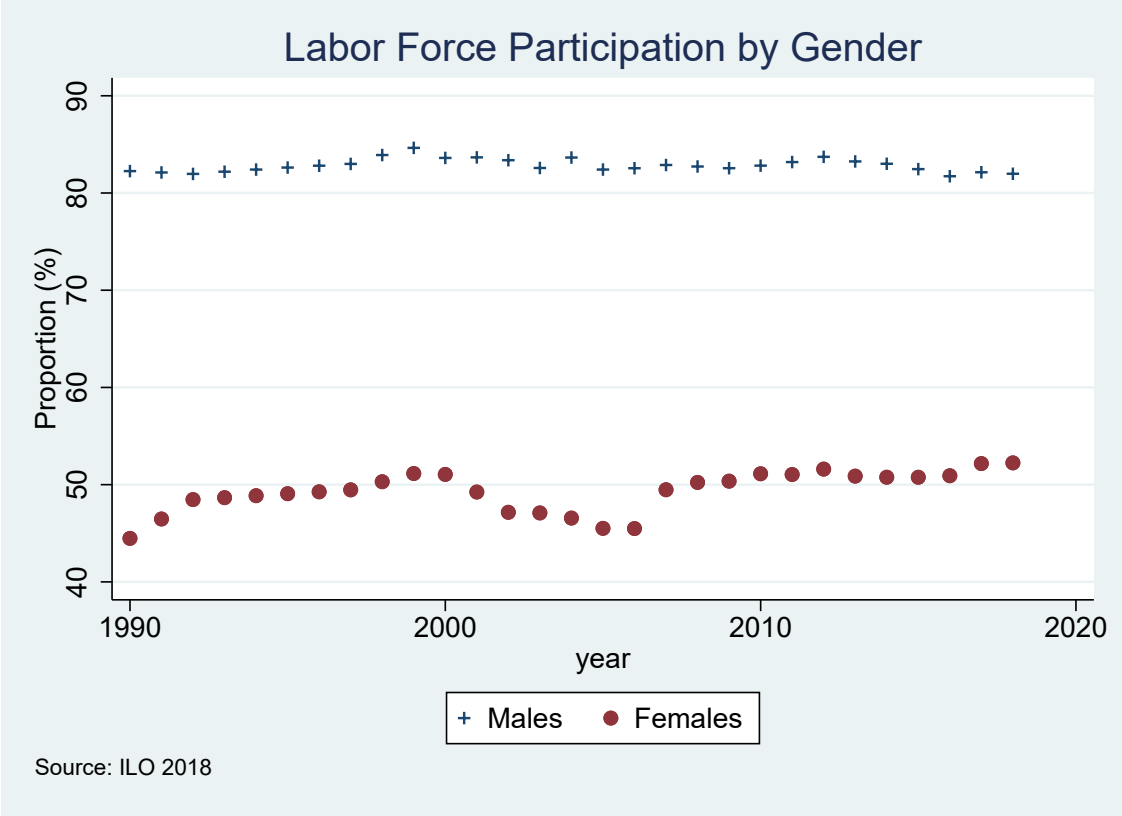

Figure 2.9: Labour Force Rate

ment being higher. The gap widened again in 2001 and peaked in 2005. The gap between female and male unemployment narrowed since 2011 and in 2013 the situation flipped making male unemployment greater than that of female.

Youth unemployment for labour force participation aged between 15 and 24 years has been considerably higher than total unemployment rate. Figure 2.12 presents the youth unemployment rate by gender between 1995 to 2019. Female youth unemployment has been higher than that of male.

Labour force especially female is more concentrated in part-time employment. Figure 2.13 depicts the part-time employment rate by gender. Female part-time employment rate was as high as 50% in 2000 after the monetary crisis. The rate fluctuated to around 40% in 2018. On the other hand, male part-time employment rate has been more stable and remains at around 25%. Figure 2.14 shows employment of people who completed secondary school by gender.

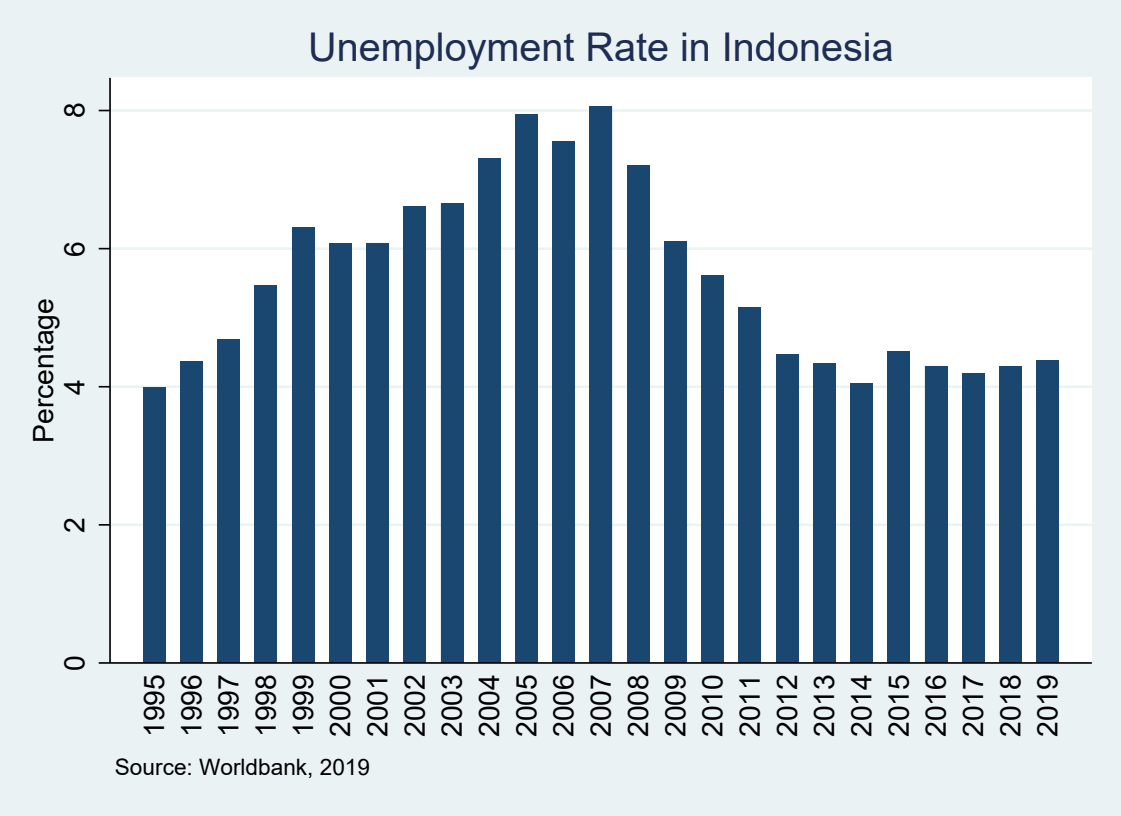

Figure 2.10: Unemployment Rates

Female family workers has seen a considerable decrease since early 1990s, from above 40% to below 25% in 2018 as shown in Figure 2.15. On the other hand, the rate for male decreased steadily from 11% to about 6% in 2018. Women are more likely to work for family although the trend is decreasing.

Figure 2.16 presents male and female workers by age distribution. The number of males who work are much higher than females in all of the age groups. The largest age group who work are between 20 and 45 years. The surprising trend is that for age groups above 60 have more people work although the retirement age is 55. This trend suggests the improvement in health, so they are still able to work.

Figure 2.17 presents the workers distributions based on education by gender. The number of male workers is higher than female workers for every education level. Most of the workers have primary education, followed by junior secondary and senior secondary education. The number of male workers with vocational

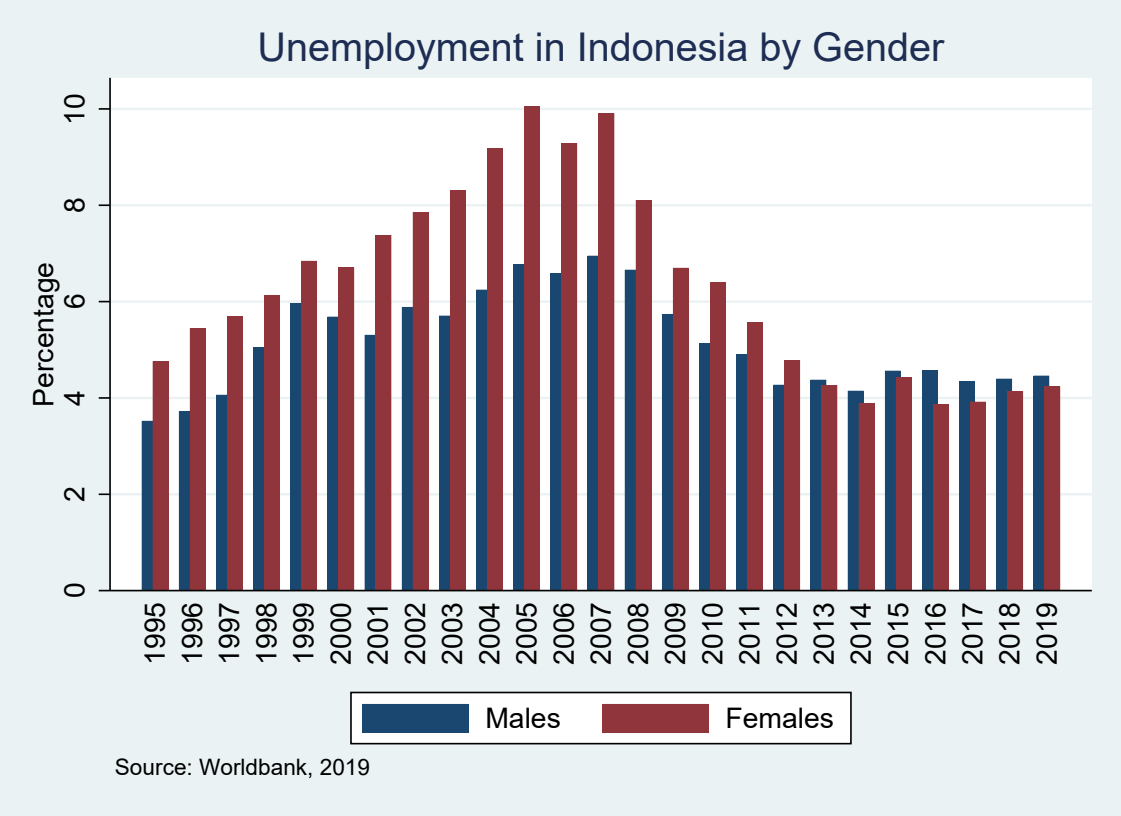

Figure 2.11: Unemployment Rates by Gender

secondary education is more than female workers with vocational schooling.

2.3 Education System and Level of Attainment

Indonesian education system consists of formal education, non-formal education, and informal education. Formal education comprises early childhood education, basic education which consists of primary and junior secondary schools henceforth compulsory education, senior secondary education, and tertiary education. Home-schooling is considered as informal education.

(i) The early childhood education can be found in the form one-year or two-year of kindergarten in the formal education where children can start at the age of 5 or younger. Children's playgroup is the form of non-formal education which can be administered by training or community organisations.

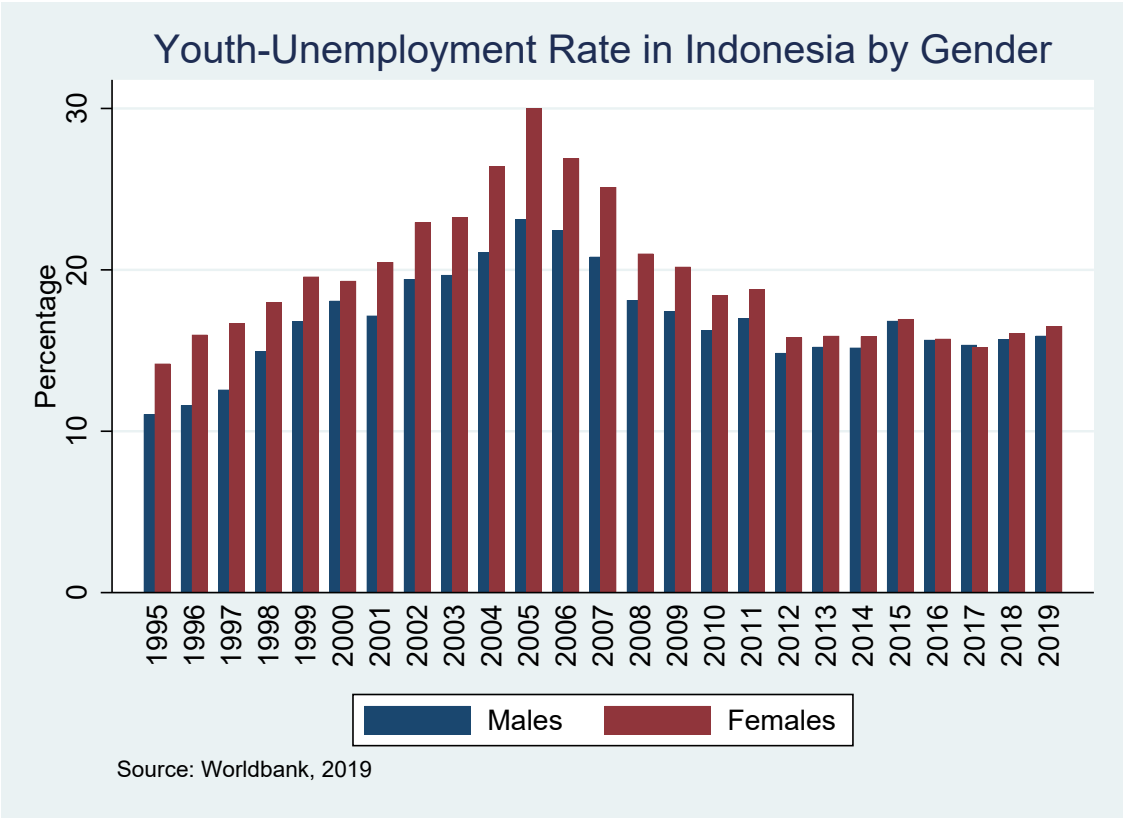

Figure 2.12: Unemployment Rates by Gender

(ii) Basic education is the compulsory part of Indonesian education system. It consists of six years of primary school and three years of junior secondary school. Before 1994, the compulsory education was six years in primary school. School-entry age for primary school at the age of seven. Pupils must pass the primary school national examination in order to enter junior secondary school. For the non-formal education, children who reach the age of 13 can sit in the *Kejar paket A* [1] primary school equivalent test and receive primary school certificate upon passing the test. Children who already reach the age of 16 can sit in the *Kejar paket B* [2] junior secondary school equivalent test and receive junior secondary school certificate upon passing the test. The government through regional education board works with the

[1] *Kejar paket A* or learning package A comprises primary school materials which test is equivalent to the primary school national exam

[2] *Kejar Paket B* or learning package B comprises the three year of junior secondary school teaching materials which test is equivalent to the junior secondary school national exam

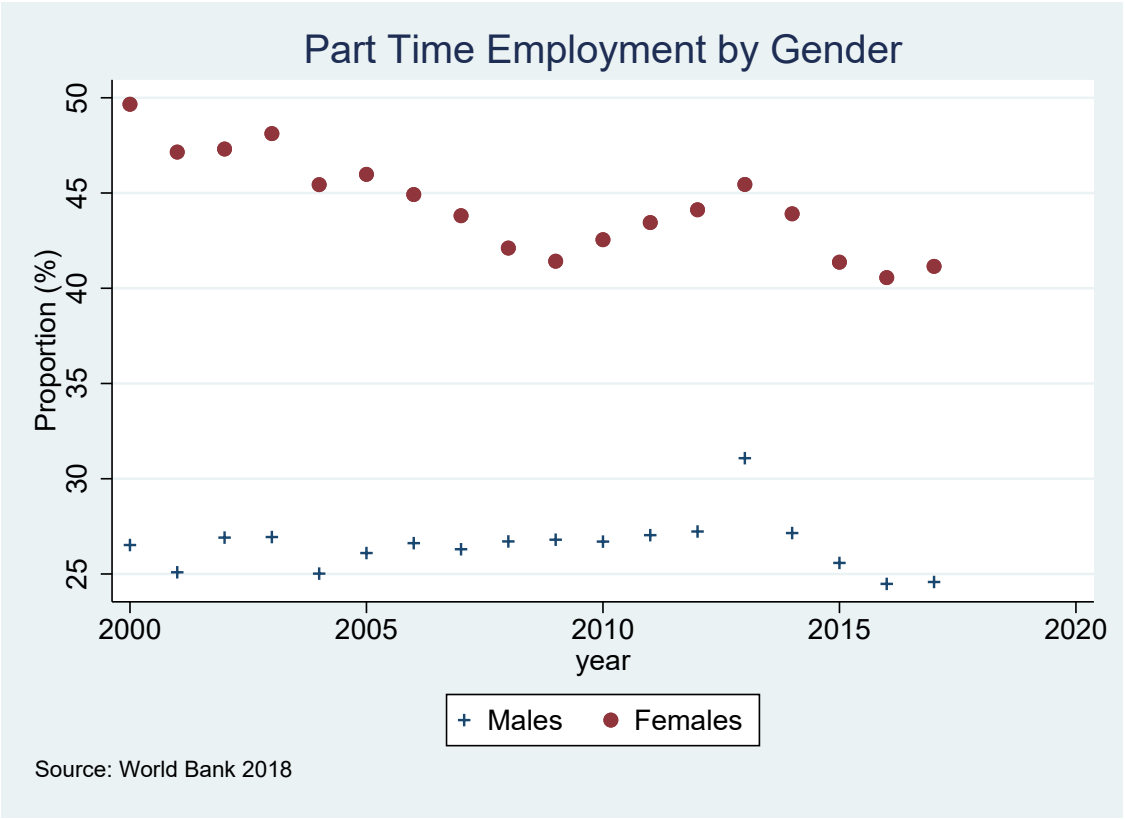

Figure 2.13: Part Time Employment

local communities to provide tutorials for the equivalent programmes.

(iii) Senior secondary education is three years of schooling following basic education. The three years secondary education is provided in public and private schools for formal education. The senior secondary education also provides opportunity to study in vocational schools where they can learn technical work skills such as mechanical, electronics to become technicians, nursery to become nurse assistants, or in tourism. For the non-formal education, children who already reach the age of 19 can sit in the *Kejar paket C* [3] senior secondary school equivalent test and receive high secondary school certificate upon passing the test.

[3] *Kejar Paket C* or learning package C comprises the three year of junior secondary school teaching materials which test is equivalent to the senior secondary school national exam

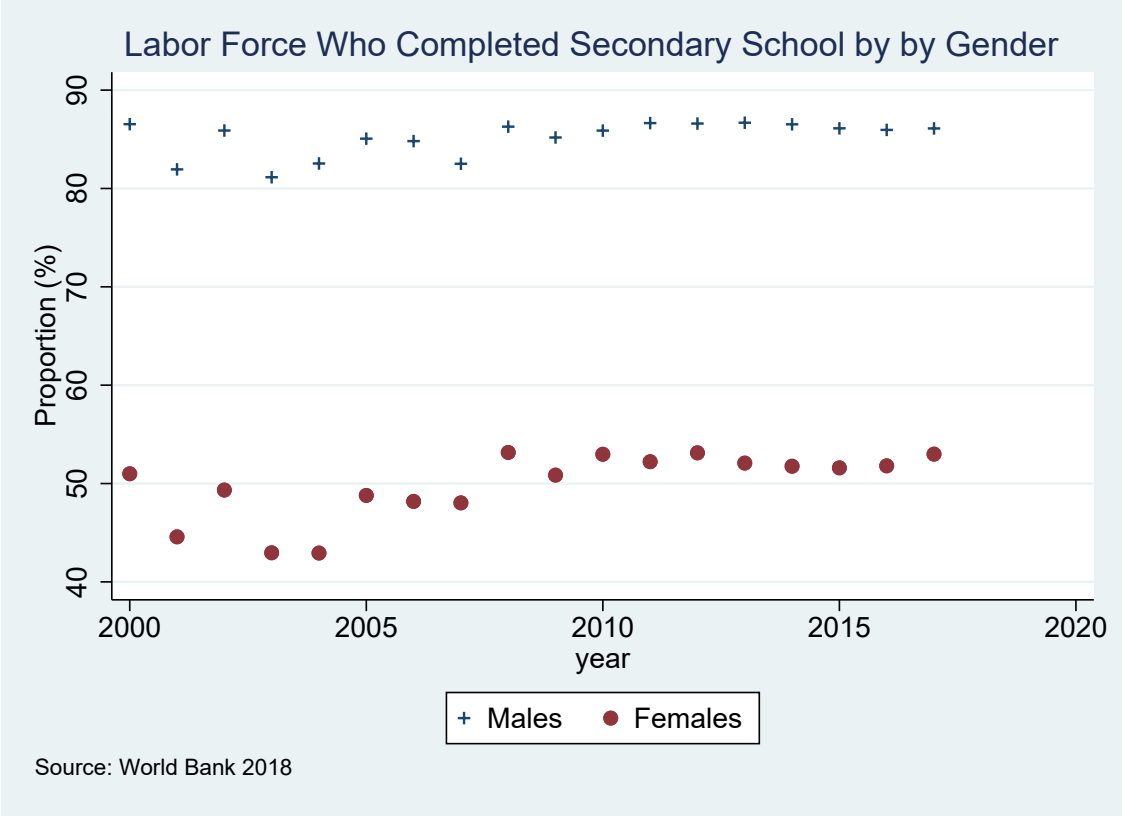

Figure 2.14: Labour Force Participation of people completed Secondary School

(iv) Tertiary or higher education comprises university and vocational college education. University offers a four-year bachelor's programme, a master's degree programmes require two years to complete and doctoral programmes require three to four years to complete the degree. Whereas in vocational college, people can study a one year up to four years of studies to obtain a vocational diploma. High secondary school students must pass the high secondary school national exam and national university exam to enter public universities. Private universities organize their own student selection tests.

There has been a steady increase in schooling over the last 20 years. Pre-primary school gross enrolment in 2017 is 40% with no difference between males and females. The gross enrolment rate for primary school is 106%, males have a higher rate of 108% compared to 105% for females. Primary school completion

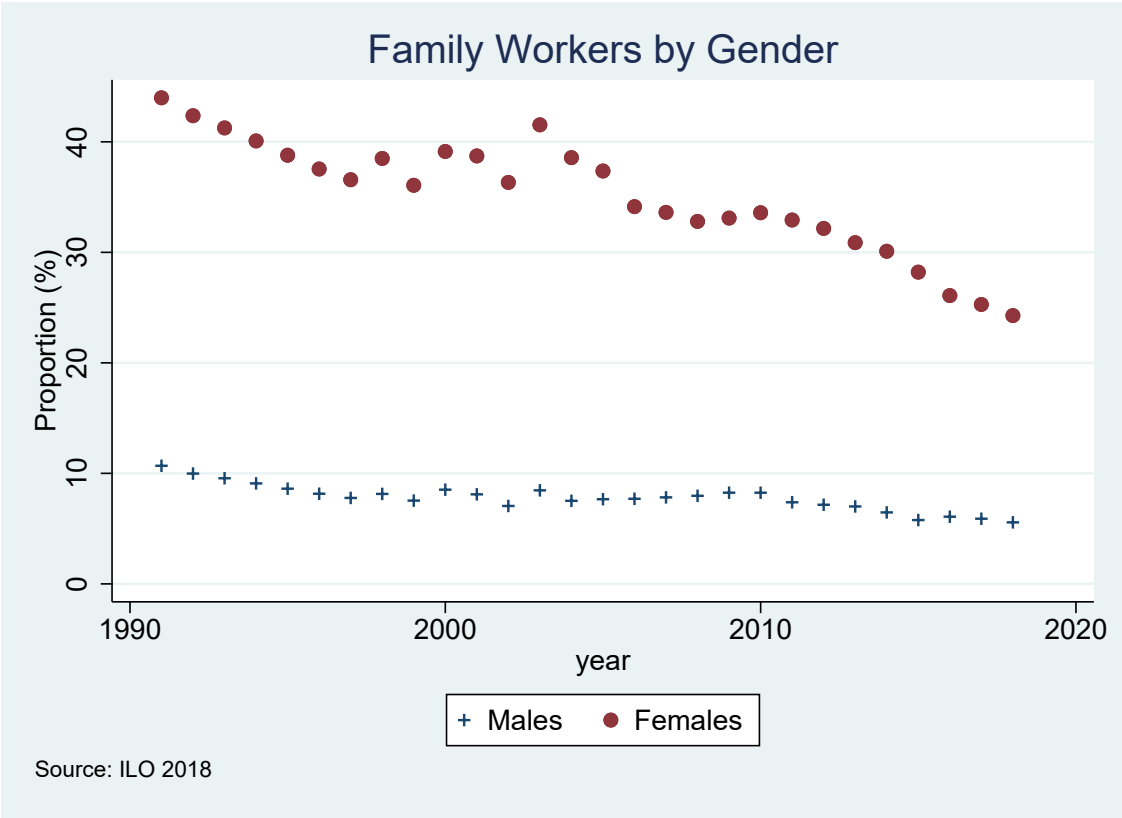

Figure 2.15: Family Worker

rate was near universal by the late 1980s with no gender gap. Currently, the total completion rate is 99% with 100% and 98% for males and females, respectively.

The gross enrolment for junior secondary school in 2017 was 87%. The rate was slightly higher for females, 90% compared to that of males, 88%. The nine years compulsory school policy had been introduced in 1994. Accordingly, the completion rate for junior secondary school has increased considerably, from 52% in 1995 to 69.1% in 2002. The current total completion rate for junior secondary school is 90%, higher than the world average of 75.6%. Females' completion rate is 92.7%, higher than that of males, 87.4%. The gross enrolment rate for senior secondary school in 2007 was 65%. The rate was slightly higher for females, 66% compared to that of males, 64%.

With respect to tertiary education, the total gross enrolment rate had increased steadily from 14.9% in 2000 to 36.3% in 2018. The gross enrolment rate was higher

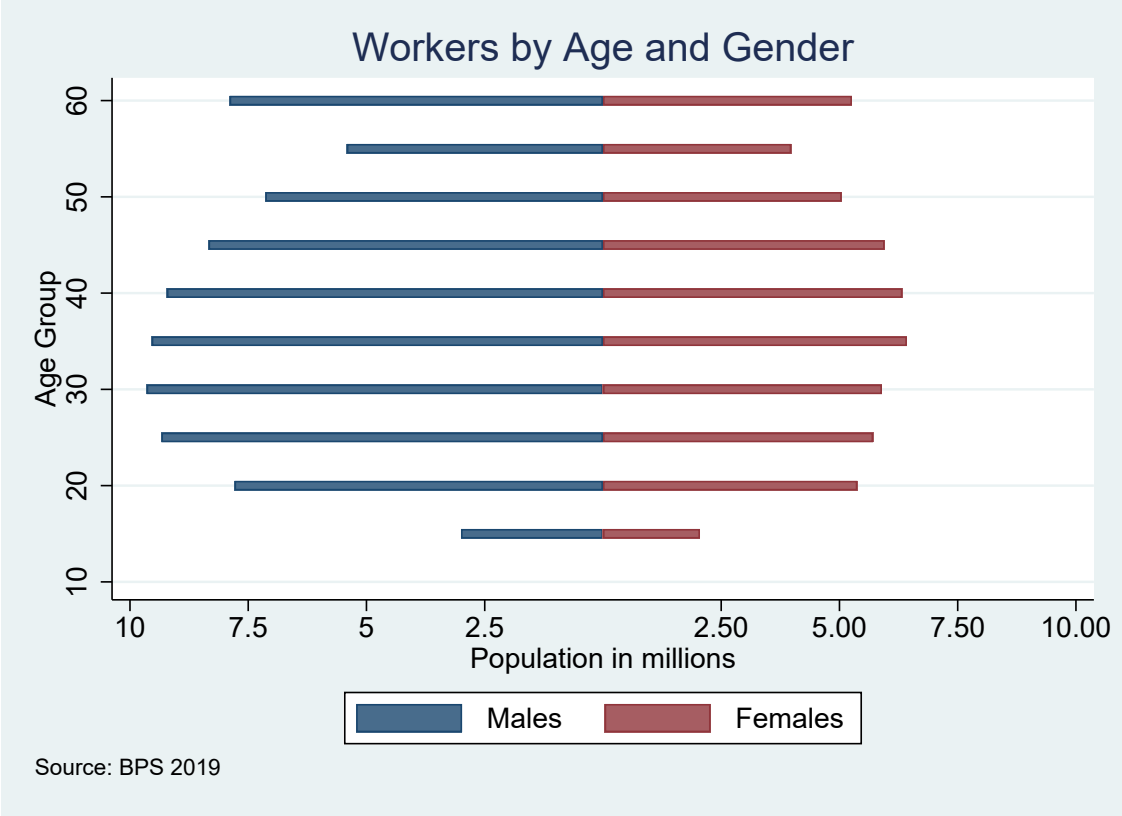

Figure 2.16: Male and Female Workers by Age

for females, 39% compared to that of males, 34 %. However, the rate was still slightly lower compared to the world average of 40%.

Since 2004, by the constitution, 20 percent of the government expenditure is devoted to education spending. However, in terms of education spending per capita, Indonesia's education expenditure is only 3.3% of its GDP. In 2015, spending for pre-primary education was 1.8% of the total education spending. For primary and secondary schools, the numbers were 42.6% and 27%, respectively. The tertiary education spending was 15.8% of the total education expenditure.

2.4 Health

The health and well-being of the Indonesian people has been improving which can be seen from the increase in the life expectancy. Figure 2.18 shows that the life expectancy at birth in 1980 was 58 and 61 for male and female, respectively. The

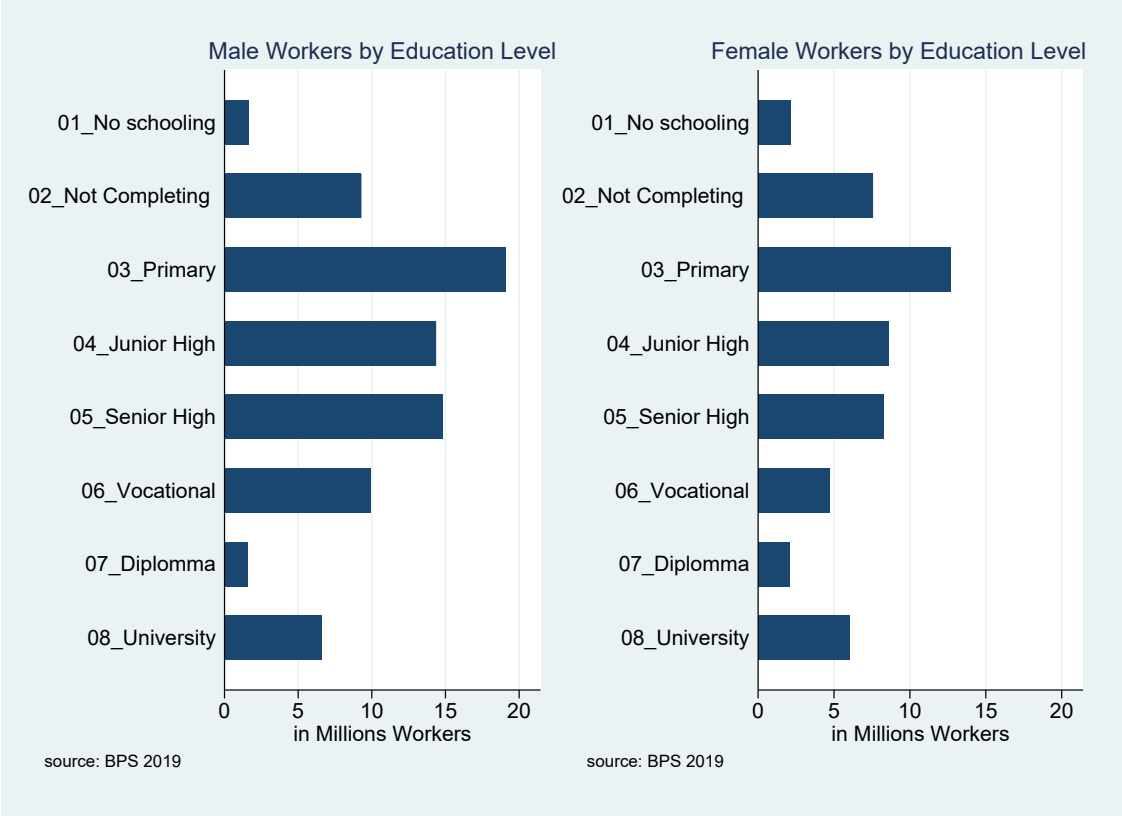

Figure 2.17: Male and Female Workers based on School Completed

figures increased steadily in 2000 to 65 for male and 68 for female. In 2017, life expectancy was 67 for male and 71 for male and female, respectively.

The improved condition in health also saw a steady decrease in both infant mortality and total mortality rates as shown in Figure 2.19. infant mortality fell substantially from 148 per one thousand live births in 1960 to 41 in 2000. In 2010, the number decreased significantly to 28 and the current rate is 21 in one thousand live births. The improvements are attributed to the gains made through the medical care infrastructure grew from very few health centres to 20,900 centres between 1960 and 2001 (Agustina et al., 2018). Overall or total mortality rate is defines as the number of deaths in 1,000 individuals per year.

Figure 2.20 depicts maternal mortality rate per 100,000 live births between 2000 and 2017. Despite the fall in maternal mortality rate (MMR) in other low medium-income countries, Indonesia's MMR improved from 272 in 2000 to 177 maternal

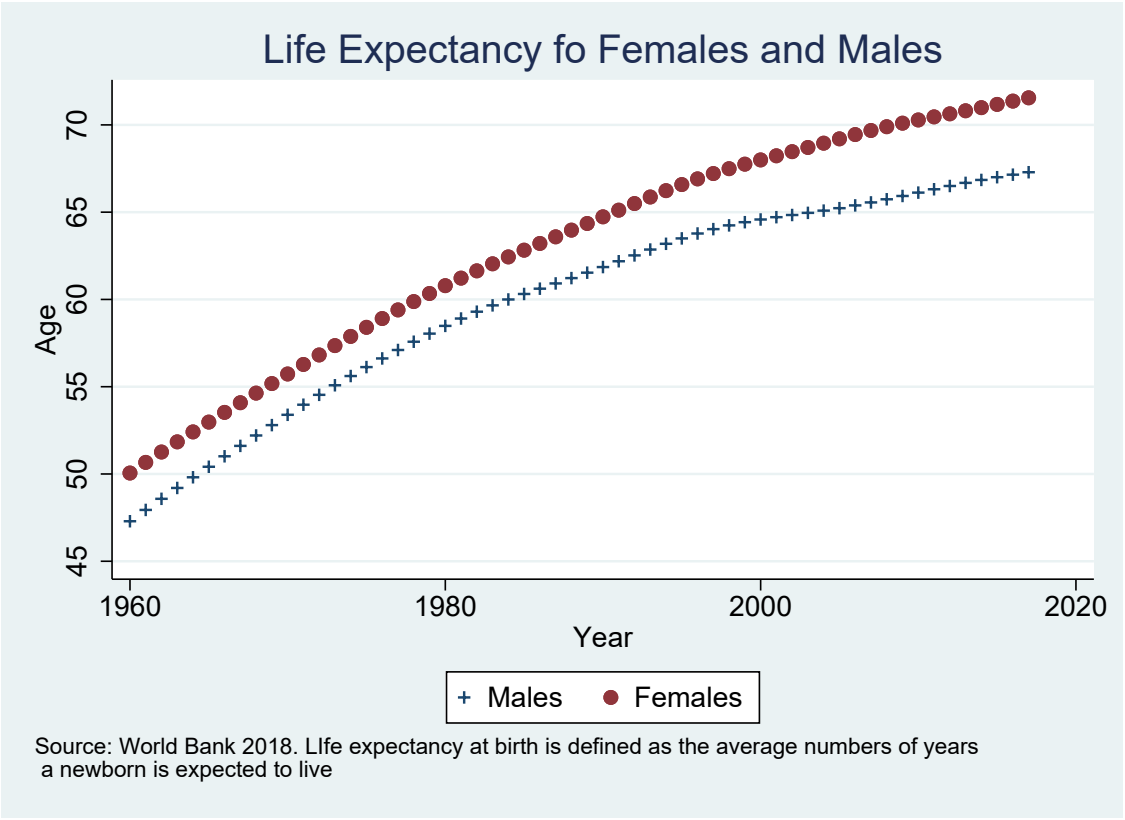

Figure 2.18: Life Expectancy by Gender

deaths per 100,000 live births in 2017. The rate was still relatively high compared to other Asian countries such as Cambodia (160), India (145), and the Philippines (121) as shown in Figure 2.21. Problems associated with poor quality of care and delayed referral were revealed in the 2011 National Survey of Health Facilities which found that only 60% of districts and 85% of cities had basic emergency obstetrical and neonatal care facilities (Triyana and Shankar, 2017).

Figure 2.22 breaks down the adult mortality rates by gender. Adult female mortality rate has decreased substantially to less than 141 in 2018, but adult male mortality rate remained higher at 200 per one thousand adults. One of the factors to higher mortality rate is behavioural, men are more likely to engage in risky and dangerous behavior and women more likely to engage in health-seeking behavior. A study on gender differences in health and mortality, analysing data from nationally representative sources including China Health and Retirement

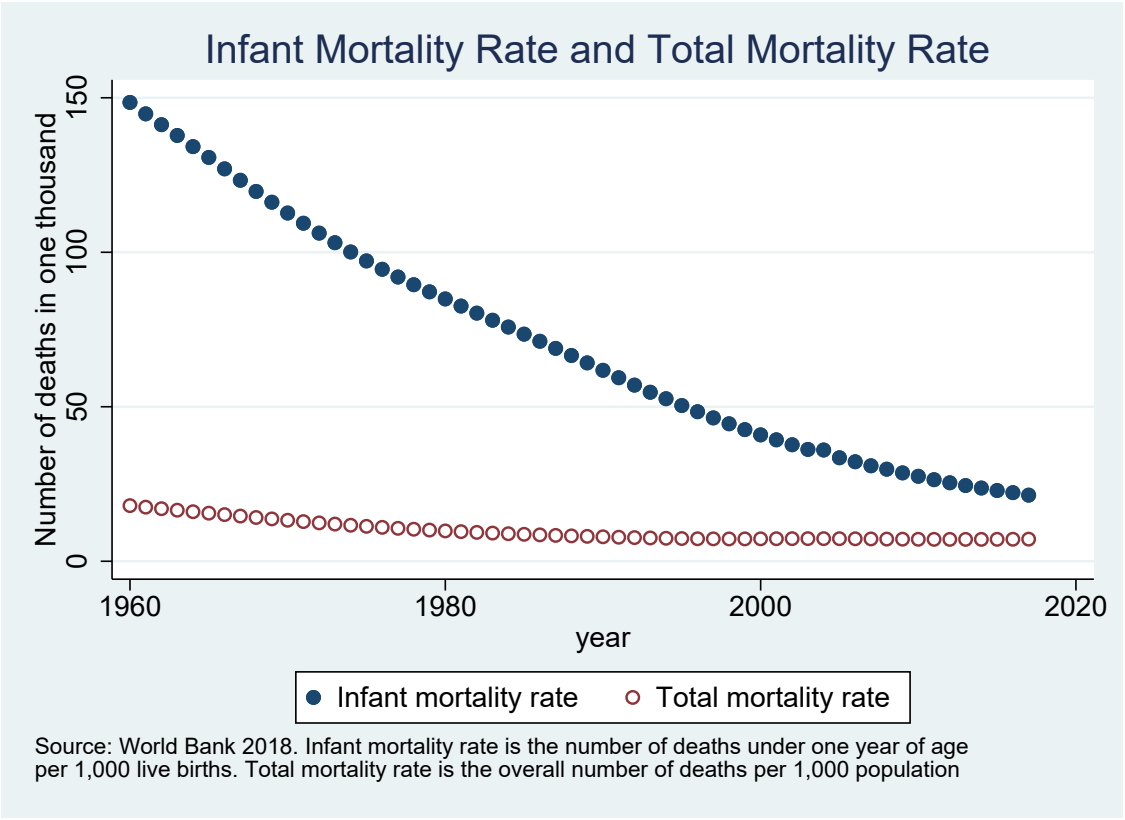

Figure 2.19: Infant Mortality and Total Mortality Rates

Longitudinal Study, Korean Longitudinal Study of Aging, India and Russia World Health Organization Study on Global Ageing and Adult Health, Survey of Health, Ageing and Retirement in Europe (SHARE), the US Health and Retirement Study, English Longitudinal Study of Ageing, Indonesian Family Life Survey (IFLS), Taiwan Social Environment and Biomarkers of Aging Study, and Mexican Health and Aging Study (MHAS). The study found that overall male life expectancy is lower than female life expectancy. The study also found that men tend to have more cardiovascular diseases, more hypertension and women tend to have more inflammatory-related diseases (Crimmins et al., 2019). The economic structure also influences men and women's health because of differences in occupations, economic well-being, and family responsibilities, which can have long-term health consequences (Crimmins et al., 2019).

In response to the need of having an adaptable, affordable and accessible health

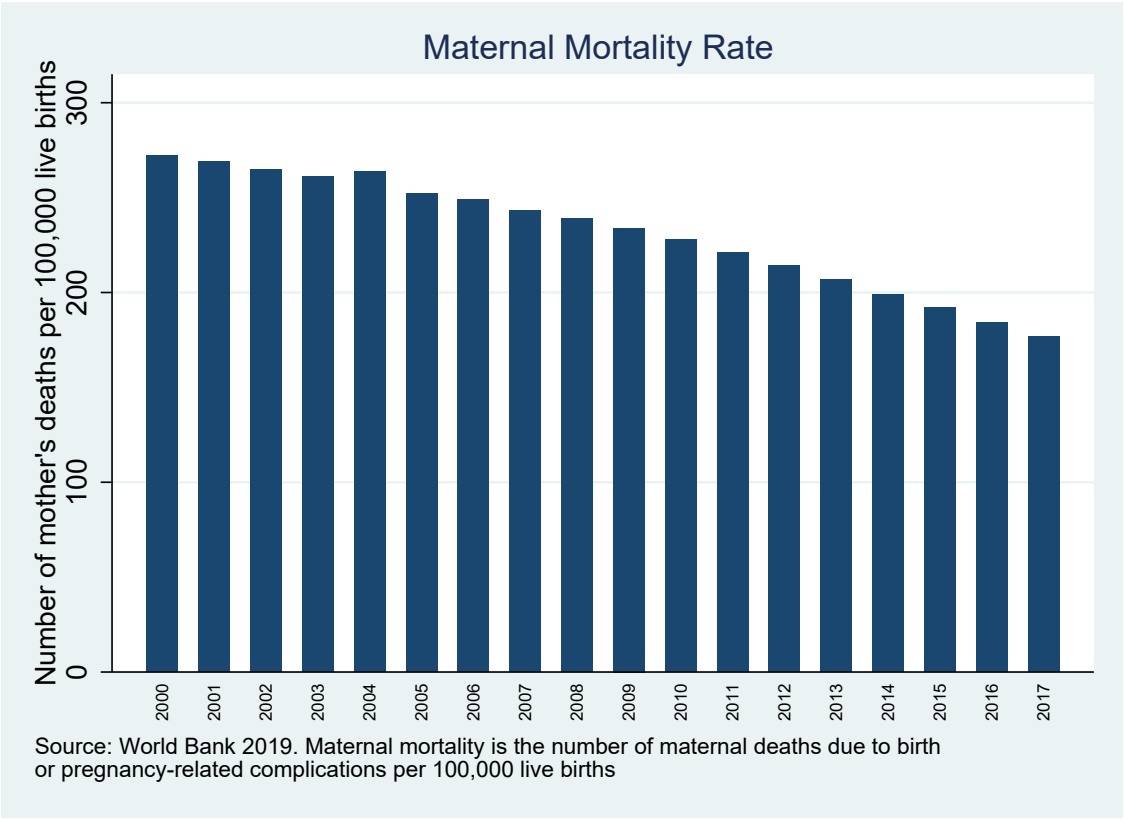

Figure 2.20: Maternal Mortality Rates

care for everyone as stipulated by the Sustainable Development Goals (SDGs), the Indonesian Government launched a comprehensive universal health coverage (UHC) in 2014 as a single-payer UHC scheme. The healthcare services are provided both at public local and private local health facilities which participate in the programme. It has 203 million members in 2018 which makes Indonesian UHC the largest in the world (Agustina et al., 2018). Currently, the number of private healthcare facilities including private hospitals participate in the programme keeps increasing.

Fertility rates between 1960 and 2017 is depicted in Figure 2.23. Fertility rate is defined as the average number of children born per childbearing age (15-49) women. The number of births per Indonesian woman decreased steadily from 5.6 in 1960 to 2.5 births per woman in 2008. The current fertility rate is 2.3, similar to world average of 2.4. The Indonesian Government established the National Population and Family Planning Agency in 1987 and had made a considerable

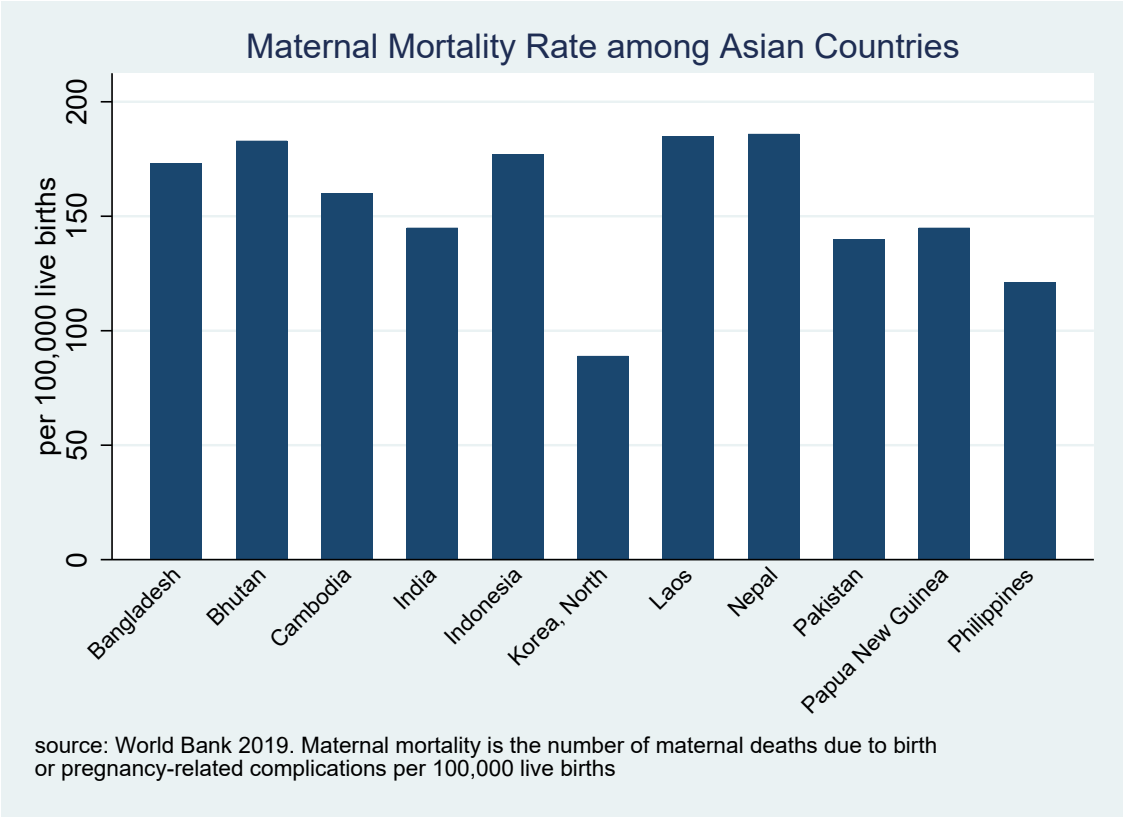

Figure 2.21: Maternal Mortality Rates in Asian countries

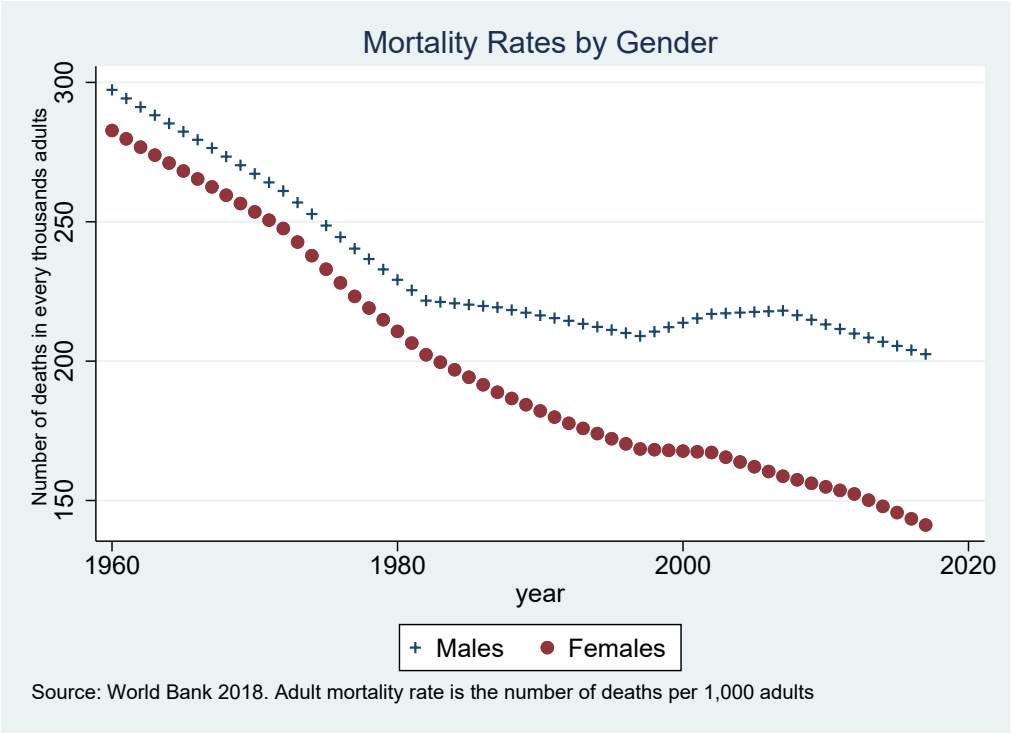

Figure 2.22: Adult Mortality Rates

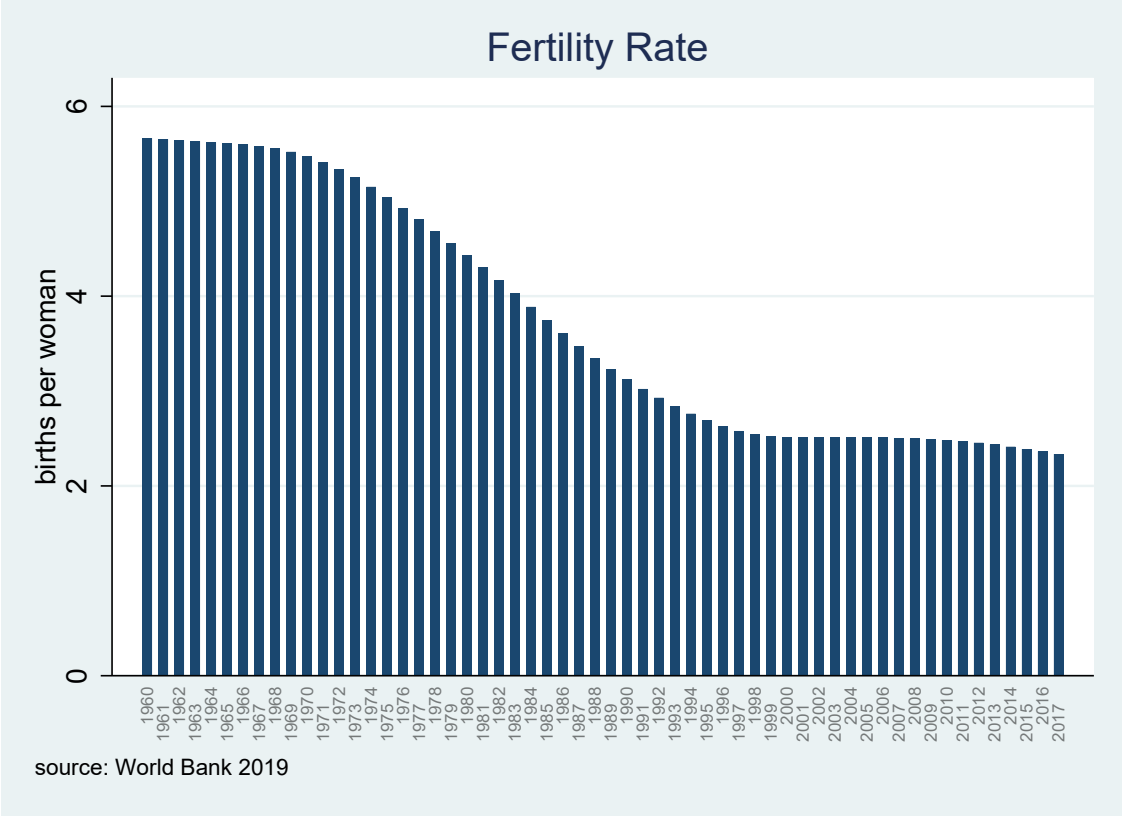

Figure 2.23: Fertility Rates

success in 1997, when 55% of couples used modern contraception increased from 25% in 1960 (World Bank, 2018).

Along with improvements in economic conditions, health spending per capita had increased steadily. Health spending per capita at PPP current had increased steadily from $90 in 2000 to $244 in 2010. In 2016, the figure increased to $362.7. However, the share of health expenditure as percentage of GDP had been very low, it was 1.92% in 2000 and increased to 3.12% in 2016 (World Bank, 2018).

2.5 Village Government and Health Institutions

Village is the smallest government administrative unit in Indonesia. The larger administrative units are subdistrict, district/municipality, province and central government. There are two types of villages based on the rural and urban location. *Desa* is a village located in Indonesia's rural area and *kelurahan* is a village in rural

area. Unlike urban village, whose leaders are appointed by district leaders, the *desa* leader is elected by its people through local village election.

Indonesia's political reforms in 1998 have created new opportunities for an amended relationship between the government and the community. The reform replaced the dictatorship era's centralistic government (1967 to 1998) with local-level institutions that are strong and dynamic (Antlov, 2003). All Indonesian village have started to hold elections after the reform. Hence, the village is no longer the single authority in the community. Village governments are provided with broad autonomy and do not need approval from higher authority in decision making and implementing policies. Decentralisation and democratization are necessary but not sufficient conditions for developing country and in poverty eradication (Antlov, 2003). Civil society are engaged with active village government in decision making process by the presence of village councils. It is expected that ordinary people are included in the process.

In a village level, the health institutions comprise Posyandu (regular health sessions) with its Posyandu cadres involving the village government and volunteers, head of village empowerment unit and village midwife. The posyandu in a village will be attended by village midwives or occasionally by doctors from subdistrict health centre (Puskesmas). The Posyandu cadres and village midwife report their activities to Puskesmas periodically.

The Indonesian Government deployed more than 54,000 midwives to villages throughout Indonesia between 1990 and 1996 through the Village Midwife Programme introduced in 1989 to increase access for women in rural villages to quality health care (Darja et al., 2004). Under the program, midwives were trained in nursing and midwifery. The programme was rolled out in phased with priority was given to poor and remote areas (Frankenberg and Thomas, 2001). Studies have provided evidence that the programme had successfully decreased infant mortality

, improving BMI of reproductive-age women, child birth weight and height for age (Frankenberg, 1995; Frankenberg and Thomas, 2001; Frankenberg et al., 2005).

Indonesian Ministry of Health allocates a designated fund for health which focus on the readiness of health facilities for expectant mothers and giving birth. In 2006, the Ministry of Health had educated and assigned more than 54,000 village midwives through *Bidan Desa Program* (health.bmz.de). In 2013, the Ministry of Health provided midwives kits and assigned 104,178 village midwives throughout all Indonesian villages. They claimed that it had contributed to a substantial decrease in maternal mortality (Performance Accountability Report, Ministry of Health, 2013)

Since 2014, based on Undang-undang (Law) number 6 year 2014 on the Village Government (*Undang-undang tentang desa*) Indonesian Government has initiated the Ministry of Villages, Development Acceleration and Transmigration (Inter-island migration). The law instruct the Ministry provides fixed funds to support all Indonesian villages. The village fund is allocated in Annual State Budget.

3 Data

3.1 Conditional Cash Transfers programme (PKH) Data

The data on Conditional Cash Transfers programme, PKH 2007, 2009 and 2013 is used for chapter 4, the impact of conditional cash transfer programme on female labour participation. The *Program Keluarga Harapan*, PKH, household CCT programme data is obtained from the World Bank and the National Team for Acceleration of Poverty Reduction (TNP2K). The data used for Indonesia CCT programme PKH is obtained from *Survey Pelayanan Kesehatan dan Pendidikan* (SPKP) or Health and Education Service Survey from the World Bank (`http://microdata.worldbank.org/index.php/catalog/1047`) and published data from the National Team for Acceleration of Poverty Reduction (TNP2K). The survey consists of three waves of household surveys conducted by the World Bank in 2007, 2008 and in 2009 and the endline survey conducted in 2013 by the National Team for Acceleration of Poverty Alleviation (TNP2K).

The baseline survey (2007) was designed as randomised controlled trial (RCT) in six provinces; DKI Jakarta, West Java, East Java, North Sulawesi, Gorontalo and East Nusa Tenggara (NTT). The richest 20 percent of districts in each province

were excluded from CCT programme. The randomisation is carried out across eligible subdistricts or *kecamatan* (World Bank Impact evaluation report, 2011). Selection criteria for eligible sub-districts was based on special characteristics including prevalence of malnutrition, poverty rate, school drop-out rate, and availability of health and education facilities. Subsequently, from the eligible sub-districts list, two sets of sub-districts were randomly selected to be assigned as treatment and control groups. From each sample PKH sub-district, households were randomly sampled based on PKH beneficiary's criteria. The baseline survey included a random sample of people who are eligible but are not going to receive PKH (serves as counterfactuals) in randomly selected PKH treatment sub-districts. The survey also included a random sample of eligible households as counterfactuals in randomly selected control sub-districts (World Bank report, 2011).

Table 3.1 lists the questionnaire modules which comprise household core, school-aged children core, babies and toddler, home-based tests scores data, village characteristics, community health centers, midwives, primary schools, junior secondary school data, and village health service staff.

3.2 Indonesia Family Life Surveys (IFLS) Data

Chapter 5 on the investigation of the effects of nine-years compulsory schooling employs Indonesia Family Life Survey (IFLS) data. IFLS is an on-going longitudinal household survey conducted by the RAND Corporation. IFLS is an integrated socio-economic longitudinal survey comprising wide-range information including the lives of the respondents, households and their communities. The survey is a representative sample of about 83 percent of Indonesian population which includes over thirty thousand individuals. The first wave, IFLS1, was conducted in 1993-1994. The survey sample represented about 83% of the Indonesian population living in 13 of the country's 26 provinces in 1993. IFLS2 followed up with the same sample

Table 3.1: Survey questionnaire modules

Modules	Information_Contents
Household	Respondent: Female household head or spouse of a male household head. Household roster, deaths of household members in the past 12 months, migration, water, receive of government social assistance programmes, participation in non-formal education, consumption, assets, morbidity, outpatient care use.
Mothers	Respondent: Mothers aged 16-49 years. Fertility history, access to healthcare services during pregnancy, family planning, health and education knowledge.
Children	School-aged children. Children aged 6-15 years. Respondent: mother of the child. School enrolment, attendance, cost of schooling, education assistance, child labour.
Babies and toddler	Children aged less than 3 years. Growth monitoring, immunisation records, moto development, nutritional intake.
Home-based tests	Math test and reading skills administered at home (separate test for aged 6-12 and 13-15).
Village characteristics	Respondent: village head. Demography of the village, village information, access to health services and schools, economic shocks, community participation, daily wage rate
Community Health	Community Health Centers (Puskesmas). Head of facility information, coverage area, budget, staff roster, time allocation of lead doctor and midwives coordinator, services provided, fee schedule, number of patients served during the last month, medicines and vaccine stock, data on village health staff, direct observation on facility cleanliness and hygiene
Village midwives	Personal qualification and background, location of duty, condition of facility, time allocation, income, services provided, fee schedule (public and private), experiences during past three deliveries, number of patients during the last month, equipment and tools, medical supplies and stock, village post management, structure of subsidies received.
Schools	Principal qualification and background and time allocation, teacher roster, school facilities, teaching hours, enrolment records, attendance records, official test scores, education assistance, fees, budget, direct observations of classrooms and random check on classroom attendance.

Note:
Source: World Bank, 2011.

four years later, in 1997-1998. One year after IFLS2, a 25% subsample was surveyed to provide information about the impact of Indonesia's economic crisis. IFLS3 was fielded on the full sample in 2000, IFLS4 in 2007-2008 and IFLS5 in 2014-2015.

In the compulsory schooling study, the latest wave survey is employed, IFLS-5 which was conducted in 2014-2015 (`https://www.rand.org`). In IFLS5 the recontact rate was 92%. Individual target households (including split-off households as separate) the recontact rate was 90.5%. These recontact rates are as high as or higher than most longitudinal surveys in the United States and Europe. High re-contact rates were obtained in part because their commitment on tracking and interviewing individuals who had moved or split off from the origin IFLS1 households. High re-interview rates contribute significantly to data quality in a longitudinal survey because they reduce the risk of bias due to nonrandom attrition in studies using the data.

In this study, the observations are restricted for year of birth from 1968 to 1989 which includes individuals born 11 years before and after the cut-off date. The assumption is all individuals from 1979 birth cohorts entered junior high school in 1994 or later. This is a reasonable assumption as most children in Indonesia enter primary school at the age seven and thus would enter junior secondary school at the age of thirteen.

3.3 National Programme of Community Empowerment (PNPM) Data

Chapter 6 on the evaluation of the Generasi National programme of Community Empowerment data uses data obtained from *Survey Pelayanan Kesehatan dan Pendidikan* (SPKP) or Health and Education Service Survey from the World Bank (`http://microdata.worldbank.org/index.php/catalog/1047`) wave I in 2007 and wave III in 2009. All the villages within treatment subdistricts receive the fund. PNPM Generasi programme fund is administered within a village-level. In

2007, PNPM Generasi provided 1,605 villages in 129 subdistricts with an annual block grant (Olken et al., 2012). The Generasi treatment receive a block grant with an average amount of US $100,000 for each subdistricts. Of the total Generasi subdistricts, 90% are in rural areas. Generasi targeted rural subdistricts which have participated in the KDP, Subdistrict Development programme (KDP)[1] for a minimum of two years and have certain experience with village-level planning (Sparrow et al., 2008). There are no supply-readiness requirements since Generasi intended to improve less supply-ready areas[2]. The randomisation for the treatment and control groups was done at subdistrict levels. The randomisation process involved drawing 300 subdistricts to be assigned as treatment and control subdistricts. There are 200 subdistricts assigned as treatment areas and 100 subdistricts assigned as control areas. The individuals that are used for impact evaluation purpose are sampled from five provinces (West Java, East Java, North Sulawesi, Gorontalo, and East Nusa Tenggara) in 3000 villages and 12 thousand households that were randomly selected from the 300 Generasi programme subdistricts.

Figure 3.1 depicts the the distribution of number of children based on mothers' age in 2007 and 2009 and figure 3.2 depicts the distribution of toddlers based on their age (months) for both boys and girls in 2007.

In terms of healthcare providers, Generasi programme surveys 300 Puskesmas, one Puskesmas was randomly selected from each subdistrict, 696 midwives and 1200 Posyandu. Sampling frame for midwives was from list of midwives who work in Puskemas and list of private practice midwives. Two midwives were selected from the Puskesmas list and two from private practice list (Sparrow et al. 2008). Health providers were asked about medical supplies, equipment, staff and services provided.

[1]Kecamatan Development Programme (KDP), initiated in 1998 is subdistrict development programme which provides financial support to build infrastructure and capacities in rural areas.

[2]Areas are supply-ready if they have adequate facilities and infrastructures for health and education

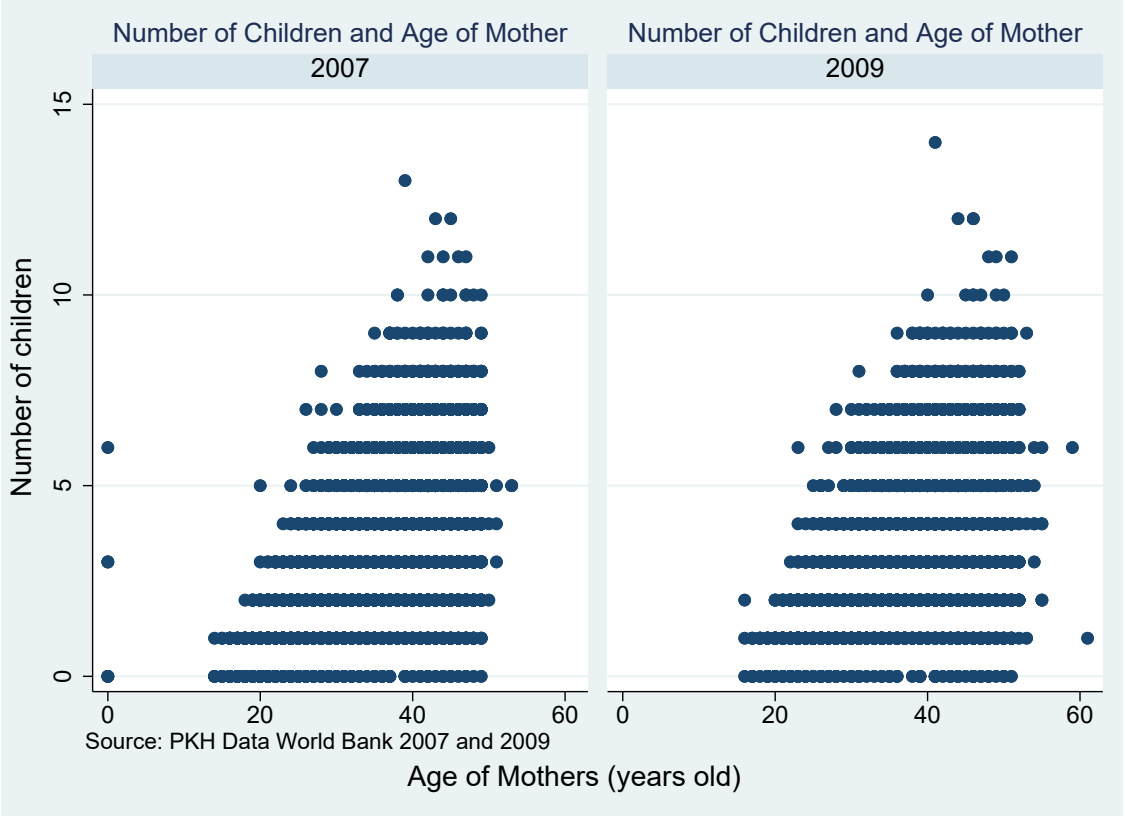

Figure 3.1: Number of Children and Age of Mother Year 2007 to Year 2009

3.4 Village Potential Data (PODES)

Village potential data is a village population census which is conducted three times every ten years which comprises of more than 65 thousand villages. The first survey was conducted in 1976 called Village Facilities. The Village Potential Statistics (PODES) dataset provides information about village (*desa*) characteristics across Indonesia.

Information collected in Podes comprises village characteristics, employment, housing and environment, natural disasters and natural disaster mitigation, education and health facilities, social and cultural facilities, sports and entertainment facilities, transportation facilities and infrastructure, information and communication facilities, economy and finance infrastructures, security, village community empowerment and village government personnel. It is surveyed in the context of

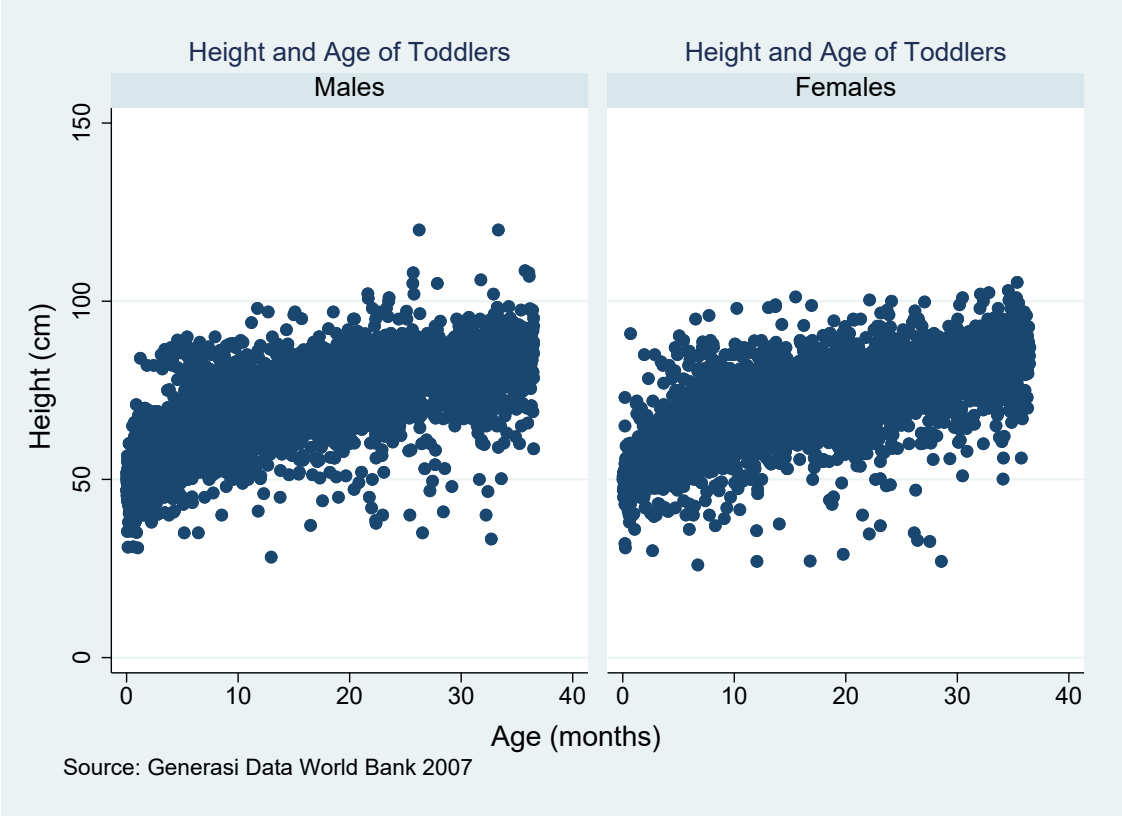

Figure 3.2: Height and Age of Toddler in Year 2007 to Year 2009

the periodic censuses (Agriculture, Economy, Population). The Indonesia National Statistics Agency (BPS) has collected village-level data since 1980. PODES activity has been conducted in-line with the implementations of the Population Census, Agriculture Census and Economic Census.

The latest 2018 PODES data shows that there are currently 83,931 village administration units which consists of 75,436 *desa* and 8,444 *kelurahan* (National Statistics Agency, 2018). Podes also recorded 7,232 subdistricts and 514 districts/municipals. *Indeks Pembangunan Desa* or village development index shows the development progress with category as "left behind", "developing" or "developed". village development index comprises five dimensions: basic services, infrastructure condition, transportation, public services and the village governance (National Statistics Agency, 2018). The village development index results categorised 14,461 villages (19.2%) as "left behind", 55,369 villages (73.4%) as "developing" and

5,606 villages (7.4%) as "developed". The 2014 village development index improved compared to 19,750 villages (26.8%) as "left behind", 51,026 (69.2%) as developing" and 2,894 villages (2.9%) as "developed"(National Statistics Agency, 2018).

Descriptive Statistics

Village Data 2006 and 2011

The Generasi programme is village-based community CCT programme which sampled from five provinces which randomised 2,306 villages from 264 Generasi subdistricts. As the fund was administered at the village level, the village potential data are shown to give a broad picture of village characteristics and facilities.

Village potential data is a village population census which is conducted three times every ten years comprises of more than 54 thousand villages. The first survey was conducted in 1976 called Village Facilities. Table 3.2 shows the villages' characteristics in terms of education facilities in all Indonesian villages in 2006 and 2011. The questionnaire asks the village the number of schools in each level and category, public and private. The average number of kindergartens in a village was one in 2006 and 1.5 in 2011. The average number of public primary schools was two in every village in 2006 and 2011 and the number was one in two villages for private primary schools. The average number of public junior secondary schools was one in five villages in 2006 and almost one in three villages in 2011. The number was one in three villages for private primary schools in 2006 and 2011. The average number of public senior secondary schools was one in 12 villages in 2006 and 2011, and the number was twice as many for private primary schools. The average number of vocational high schools was as low as one in 45 villages in 2006 and increased to one in 29 villages in 2011.

Table 3.3 shows the villages' characteristics in terms of health facilities and health personnel in 2006 and 2011. The questionnaire asks the village the number of health facilities for each type, the number of health personnel in each category

Table 3.2: Villages' Characteristics-Education in 2006 and 2011

	Year 2006		Year 2011	
Variables	No Obs	Mean	No Obs.	Mean.
Kindergarten	54,107	1.056	54,107	1.473
Primary school _public	54,107	2.044	54,107	1.933
Primary school _private	54,107	0.472	54,107	0.508
Middle school _ public	54,107	0.213	54,107	0.285
Middle school _ private	54,107	0.304	54,107	0.376
High school _ public	54,107	0.075	54,107	0.085
High school_ private	54,107	0.144	54,107	0.176
Vocational school	54,107	0.022	54,107	0.034

Note:
Village Potensial Data 2006 and 2011

and the number of people covered by the regional health insurance. Public hospital is available in district level, at least one RSUD (district public hospital) present in each district, less than 3% of the villages have hospital. The average number of community/subdistrict health centres or Puskesmas was one in 8 villages in 2006 and 2011. The number was one in three villages in 2006 and 2011 for support subdistrict health centres, while the number was one in six villages for nurse's clinics in 2006 and 2011.

Less than fifty percent of the villages have general practitioners and only fourty percent of the villages have village maternal centres. The average number of midwives in a village was 1.2 in 2006 and increased to 1.7 in 2011. The average number of neighbourhood monthly health centres, Posyandu, was 3.6 in every village in 2006 and increased to 4.7 in 2011. The average number of male doctors was one in every 2 villages in 2006 and 2011, and the number was one in 4 villages in 2006 and increased to one in 3 villages in 2011 for female doctors. The average number of people covered by regional health insurance in a village was 186 in 2006 and increased considerably to 705 individuals in 2011.

The report from World Bank on insights into health provision in Indonesia confirms that health facilities are facing distributional issue. Despite the average

Table 3.3: Village Characteristics-Health Facilities in 2006 and 2011

	Year 2006		Year 2011	
Variables	No Obs	Mean	No Obs.	Mean.
Nbr of Hospitals	54,107	0.028	54,107	0.031
Nbr of Birth Hospitals	54,107	0.089	54,107	0.084
Nbr of Com. health centers (Pusk)	54,107	0.125	54,107	0.125
Nbr of Support Com health ctr	54,107	0.315	54,107	0.303
Nbr of Nurses clinics	54,107	0.169	54,107	0.156
Nbr of GPs	54,107	0.495	54,107	0.505
Nbr of midwives	54,107	1.189	54,107	1.676
Nbr of Vill health centers	54,107	0.397	54,107	0.401
Nbr of occasional Health services (Posyandu)	54,107	3.606	53,314	4.732
Nbr of male doctors	54,107	0.422	54,107	0.425
Nbr of female doctors	54,107	0.232	54,107	0.296
Nbr of birth assistants	54,107	1.555	54,107	1.875
Nbr of people-regional health insurance	54,107	186.580	54,107	704.920

Note:
Village Potensial Data 2006 and 2011

number of doctors per Puskesmas has grown since 1996, there are more Puskesmas without doctor, especially in rural areas. Moreover, in terms of the ratio of private doctors to population, the rural-urban gap has widened (Rokx et al., 2009).

Table 3.4 shows the villages' characteristics in terms of general facilities in 2006 and 2011. The questionnaire asks questions on several village facilities (dummy variables), including whether there is any post office, village unit cooperatives, saving and credit cooperatives. Besides, the questionnaire collects data on the village's leader and deputy's education level and qualification. The average number of households connected to self-provided electricity in a village was 17 in 2006 and increased to 194 in 2011. The average number of households connected to the land-line phone in a village was 109 in 2006 and fell to 88 in 2011, which might be due the emerging use of cellular phones. The average number of post office was one in 15 villages in 2006 and fell to one in 16 villages in 2011, which might be due to the fall in the use of conventional mailing services and the rise in private delivery services. The average number of mobile post office in a village was one in

5 villages in 2006 and fell to one in 6.8 villages in 2011. The average number of village cooperatives was one in 8 villages in 2006 and fell to one in 10 villages in 2011. The average number of saving and credit cooperatives was one in two villages in 2006 and increased to one in 1.7 villages in 2011. The average number of small business credit units in a village was 3.7 in 2006 and increased to 5.7 in 2011. The average number of conventional banks was one in 6 villages in 2006 and increased to one in 4 villages in 2011. The average number of community credit banks was one in 10 villages in 2006 and increased to one in 9 villages in 2011.

In terms of education level of village leaders, the proportion of village heads who completed elementary school or less, completed junior secondary school, completed senior secondary school and completed college or higher were 33.74 percent, 48.46 percent, 4.65 percent and 15.15 percent in 2006. The village leaders' education level increased considerably in 2011. The proportion of village leaders who completed elementary school or less was 2.8 percent, completed junior secondary school was 16.13 percent, completed senior secondary school was 55.24 percent, completed college was 4.03 percent and 21.79 percent completed a university degree.

Table 3.4: Village Characteristics-Facilities in 2006 and 2011

	Year 2006		Year 2011	
Variables	No Obs	Mean	No Obs.	Mean.
Electricity by govt	50,755	620.413	54,107	744.561
Electricity self_provided	54,107	17.546	54,107	194.857
Nbr of HHs with land line phone	54,107	109.51	54,107	88.370
Any post office (dummy variable)	54,107	0.065	54,107	0.061
Any mobile post office (dummy variable)	54,107	0.18	54,107	0.146
Village unit cooperatives	54,107	0.118	54,107	0.102
Comm. Small industry coop.	54,107	0.0176	54,107	0.021
Saving and credit coop.	54,107	0.467	54,107	0.584
Small business credit	54,107	3.761	54,107	5.759
Nbr of conventional banks	54,107	0.157	54,107	0.224
Nbr of community credit banks (subdist)	54,107	0.094	54,107	0.113
Village head education (ordinal)	53,406	3.889	53,254	5.243
Year 2006 village head education level	Freq.	Percent		
No schooling (1)	846	1.58		
Not comp. Elementary sch. (2)	4,884	9.15		
Completed Elementary sch. (3)	12,288	23.01		
Completed Junior high sch. (4)	24,814	46.46		
Completed Senior high sch. (5)	2,482	4.65		
Completed college or higher (6)	8,092	15.15		
	53,406	100		
Year 2011 village head education level	Freq.	Percent		
No schooling (1)	179	0.34		
Not comp. Elementary sch. (2)	471	0.88		
Completed Elementary sch. (3)	843	1.58		
Completed Junior high sch. (4)	8,591	16.13		
Completed Senior high sch. (5)	29,419	55.24		
Completed college (6)	2,147	4.03		
Completed university (7)	11,604	21.79		
	53,254	100		

Note:
Village Potensial Data 2006 and 2011

4

Impact of Conditional Cash Transfer Programme on Female Labour Force Participation

4.1 Introduction

One of the most effective ways for a country to alleviate poverty is by breaking the poverty chain between generations through increasing consumption and inducing investment in child education and health (Barrientos and DeJong 2004, Fiszbein et al. 2009). One of the principal approaches to advance economic development is through investment in human capital (Schultz, 1961; Becker, 1964; Colclough, 1982). This approach can be achieved by improving health and education level of the people. The Indonesian Government had implemented several programmes, including social safety net, energy subsidy and unconditional cash transfer to alleviate poverty.

The Indonesian Government has implemented several programmes, including social safety net, energy subsidy and unconditional cash transfer to alleviate poverty. In 2007, the Indonesian Government launched a large-scale pilot programme of conditional cash transfer with objectives to reduce poverty, improve beneficiaries'

health outcomes and to provide universal basic education (Alatas et al., 2011).

This chapter's research objective is to investigate the impact of Indonesian Government conditional cash transfers (CCT) programme, Program Keluarga Harapan on female labour participation using clustered randomised control trial (clustered-RCT) data from years 2007, 2009 and 2013. Banerjee et al. (2015) studied seven CCTs in six developing countries; Honduras, Morocco, Phillipines, Mexico, Indonesian, Nicaragua, and Mexico. Using randomised controlled trial data, they performed difference-in-difference regressions. They did not find any significant effect on work outcomes by receiving treatment. In the study, Banerjee et al. (2015) evaluated the impact of Indonesian PKH on work two years after the programme implemented. A finding on CCT impact on fertility showed that in Honduras, the CCT had a small impact in the short-run by 2-4 percentage points. It may due to one of the requirements that new households could be registered if they gave birth to a child, and the transfer amount depended on the number of young children (Stecklov et al., 2006).

This chapter contributes to the literature by evaluating the impact of household conditional cash transfer programme on female labour participation as an unintended effect, six years after the programme implemented. This study specifically investigates labour participation of the mothers who receive the cash transfer in the household because the role as a household manager may give her more authority within the household. Later, the fertility rate among the mothers from treatment and control areas are evaluated for the unintended effect of the programme.

The programme features involve quarterly payment through post offices, conditionality and cash penalty, field facilitators, and area supply-readiness of the health and education facilities. Another characterising feature of this programme is that it is given to and managed by the adult female in each qualifying household. There is a large body of literature that shows if mothers are given greater control over resources, more resources will be allocated to children's health and education

(Thomas, 1990; Hoddinott and Haddad, 1995; Lundberg et al. 1997; Attanasio and Lechene 2002, Schady and Rosero, 2008). This feature might have implications on women empowerment and their labour supply decisions. Given the nature of the program, female decision making on how to spend the money becomes very crucial in achieving the programme objectives (Attanasio and Lechene, 2002).

A study in Mexico, Honduras, and Nicaragua indicated that the effects of the CCT programmes on adults labour participation were negative, small and insignificant (Alzua et al. 2013). Although the transfers were substantial in size, the programmes did not reduce the labour supply in the short run. There were additional findings for the Mexican Progresa, which indicated a small positive effect on the work hours of female beneficiaries, a considerable increase in wages among male beneficiaries, which resulted in an increase in household labour income two years after the programme implementation (Alzua et al. 2013). The impacts could be attributed to the changes in the adults' labour supply in eligible households and to the increased available time of women as a result of higher children school enrolment rates (Alzua et al. 2013).

While the programme was designed as a direct incentive to improve health and education outcomes of the beneficiaries, it is expected that the programme would affect female labour participation. The analysis and motivation of this study is focused on the latter.

This study attempts to test hypothesis that the CCT may increase female labour participation due to an empowerment effect and the cash transfer may reduce participation through an income effect. Thus, the sum of the effects depends on which effect is stronger. The total effect can be positive if the empowerment effect is greater than the income effect.

This research is important for the following reasons. First, few studies exist to date in Indonesia female labour supply and women empowerment such as conducted by Samarakoon and Parinduri (2015), Schaner and Das (2016). Therefore,

this study is going to add to the understanding of female labour supply decision making in Indonesia. Second, this study also aims to provide policy implications to improve programme effectiveness of the ongoing poverty alleviation programmes, particularly in empowering women.

In modeling female labour supply in a developing country, the relationship between female labour force participation (FLFP) and development needs to be analysed. The relationship is complicated and reflects changes in education levels, economic activity, social norms, fertility rate and other factors involving other members of the household such as spouse's income (Verick, 2014). FLFP in Indonesia has been well documented (Smith, Thomas, Frankenberg, Beegle and Teruel, 2002; Schaner and Das, 2016). The decision making is influenced by several factors including individual preferences, family composition, labour demand conditions, as well as the types of jobs available and matched for women with education, which collectively play a crucial role in determining the labour and supply conditions. However, the above relevant variables are often correlated with one another, and the direction of causality is mixed. For example, having children may either encourage or discourage females' decision to work. It may encourage women to work because of the needs that arise due to having a child, but it could also prevent them from working due to the time constraints (Klasen and Pieters, 2015).

FLFP plays a significant role in economic development in Indonesia. Micro-level evidence shows that the high participation rate in low-income countries is attributed to inadequate income of household heads. Therefore, women need to work to earn additional income. The women work mostly in informal jobs particularly in agriculture which remuneration takes the form of unpaid, in-kind only, cash, or a combination of these (Rodgers and Zveglich, Jr., 2012). High female labour force participation rates in developing country could also reflect

poverty which implies women work to respond to family income shocks such as spouse's wage decrease.

The economic downturn in 1998 has led to Indonesia's political shift from a president dictatorship era to a reform era. The changes severely affected Indonesia's political, economic, and social structure. Unemployment rates, school dropouts, malnutrition incidence and poverty rate increased (National Statistics Agency data). The economic crisis was triggered by Asian monetary and financial crisis in 1997 when the Indonesian currency, rupiah, depreciated from an average of 2,300 per US dollar from mid-1996 1997 to 10,000 per US dollar in 1998. Due to the considerable amount of private foreign debt that was not hedged, this consequently led to bankruptcy in banking sector.[1] Plunge in market confidence led investors to withdraw their investment along with foreign capital flight. Many factories had to shut down and lay off employees because their product goods had high import content. Unemployment surged, and most people experienced lower purchasing power. At the same time, many government projects including infrastructure projects were cancelled.

As a response to the crisis, between 1998 and 2005, the government gave more attention to people who lost their jobs by creating labour intensive jobs and social safety net programme. Since the neediest households did not have access to credit markets to cope with the crisis, the government responded by launching several programmes to assist the poor. The programmes include a Social Security Net in the form of unconditional transfer in 1998, health insurance for the poor, a national fuel subsidy programme in 2002-2005 and rice for the poor in 2005.

[1]One of the International Monetary Fund (IMF) recommendations was to liquidate banks in Indonesia and Thailand due to of high internal group lending and non-performing loans. Several major banks had been taken over by the Indonesian Banking Restructuring agency, 16 banks in November 1997 and 7 more in January 1998 due to insolvency (Smith et al., 2002). The IMF recommendation in liquidating those banks was without any knowledge that there was no deposit insurance which led to customer panic and a bank run until January 1998 when a depositor guarantee institution was finally established and announced.

After enduring the Asian Financial Crisis, macroeconomic growth saw a steady improvement with annual GDP growth from minus 13% between 1997 and 1998 to 4.9% between 1999 and 2000. Despite the improvement in macroeconomic indicators, microeconomics indicators particularly health and education have lagged the macroeconomic indicators (Ministry of Social Affairs, 2007). A conditional cash transfer programme, *Program Keluarga Harapan* (PKH), launched in 2007 as a pilot project, was designed as direct incentive to improve health and education outcomes (TNP2K).

Smith et al. (2002) found that the Indonesia female labour force had a significant role in participating in the job market during the crisis. This role was particularly in the informal sector shown by an increase in female labour participation rate by three percentage points between 1997 and 1998. Whereas, male labour participation decreased by 3.5 percentage points in the formal sectors. Official Indonesian labour force statistics and ILO estimates show that FLFP rates have been roughly constant throughout the last two decades. Figure 4.1 shows an illustration of Indonesia labour force participation in 2006 by age and gender. The data is obtained from 2006 Survey Angkatan Kerja (Sakernas) employment data. Figure 4.1 shows that female labour force participation was considerably lower than that of male for all age groups.

This study will explore the impact of the CCT programme, PKH, in affecting the female decision to enter the labour market. The study is intended to answer the research question of whether the CCT programme had impact on female labour force participation. The remainder of the chapter is organised as follows. Section 4.2 describes the PKH CCT programme. background on labour supply. Section 4.3 discusses the theoretical background on labour supply. Section 4.4 discusses previous studies on conditional cash transfer programmes and the effects. Section

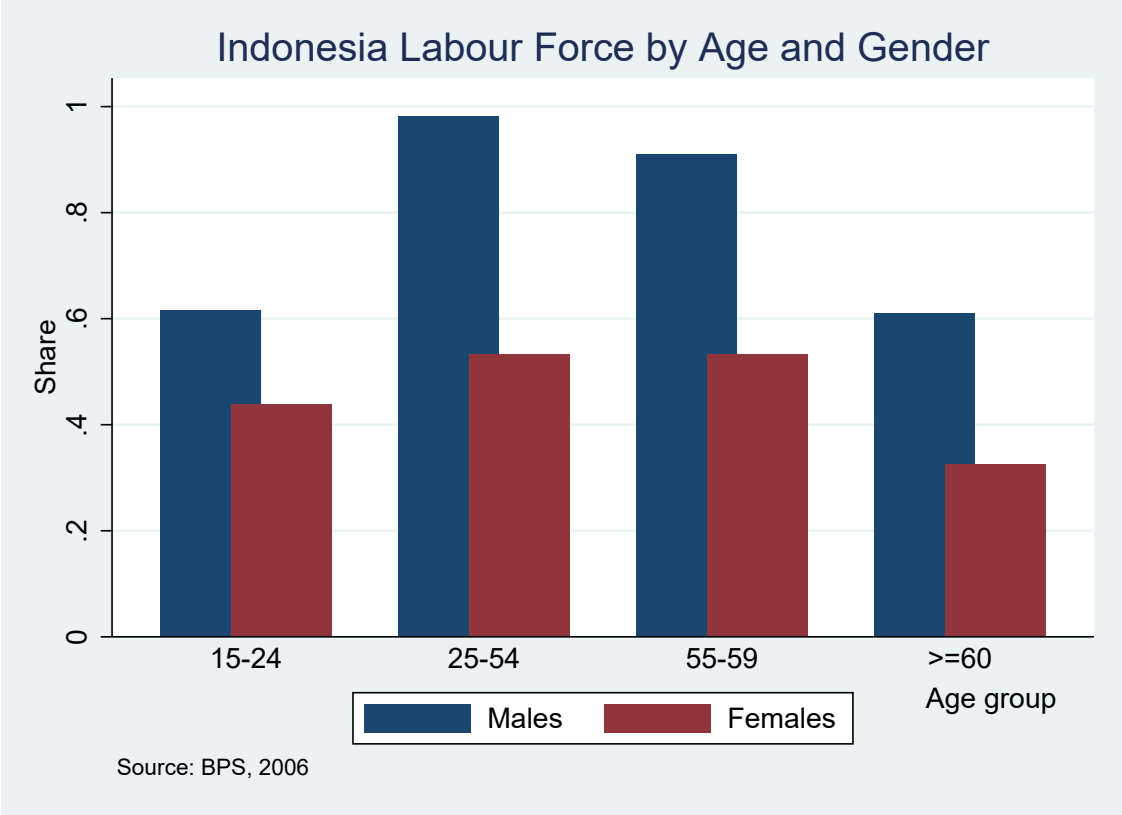

Figure 4.1: Labour Force Participation by Age and Gender, Source: National Labour Force Survey, Indonesia National Statistics Agency

4.5 describes the data employed and section 4.6 discusses the empirical specification. Section 4.7 presents the results and section 4.8 discusses the results and concludes the chapter.

4.2 The CCT Programme: *Program Keluarga Harapan* (PKH)

Poverty alleviation programmes in Indonesia are divided into three different clusters, with the objectives to improve the health and education of the households, including, economic wellbeing both individuals and the community. PKH is one of the programmes in Indonesia's social programme Cluster 1.[2]

[2]Cluster 1 programmes target individuals and households. Other programmes in cluster 1 are Raskin (subsidised rice), Jamkesmas (health insurance) and BSM (education assistance) or now Smart programme. Cluster 2 comprises several PNPM programmes, a set of community-driven development programmes to empower the people and improve the welfare of the poor communities.

Program Keluarga Harapan (PKH) is an Indonesian household conditional cash transfer programme. It was first introduced in 2007 as a pilot project in six provinces with objectives to reduce maternal mortality and to provide the beneficiaries access to public healthcare services and universal coverage of basic education. The programme was then launched as a national programme in 2012. PKH is administered by Indonesia Ministry of Social Affairs with supervision from the National Planning Agency (Bappenas).

The short-term objective of the programme is to reduce the burden of poor households, whilst the long-run goals are to break the poverty chain between generations, to improve the quality of human resources and to change health-related behaviour. The change in the behaviour is expected through tying the cash transfer with behavioural compliance. The cash transfer is conditional upon enrolment of school aged children, 85% monthly attendance in school, toddlers visits to monthly health care facilities for growth monitoring, immunisation, and nutrition supplementation, expectant and nursing mothers visit to subdistrict health care facilities to receive pre-natal checks, newborns and infants receiving post-natal care and health check-ups.

The implementation of PKH also supports the Millennium Development Goals (MDGs). Five components of MDGs are anticipated to be achieved by PKH, i.e. eradicating poverty and deprivation; providing universal basic education; promoting gender equality and women empowerment; reducing baby and child mortality; improving maternal health and reducing maternal mortality.

The payment mechanism is through cash transfer to the mother or adult female (grandmother, aunt, sister) who is then called a family manager. A female family manager is considered more effective in improving the quality of education and health of the beneficiaries. Exceptions are possible in a certain situation, such

Cluster 3 is the development of micro and small enterprises programme through the microcredit, a credit guarantee programme administered by participating public and private banks (National Team for Acceleration of Poverty Alleviation,TNP2K).

as when there is no adult female in the family, then the male household head can receive the transfer. First, the cash is paid to mothers from the nearest post office in the area. The transfer amount is between 15% and 20% of the estimated consumption of low-income households with rules on how the money should be spent. Second, PKH was designed to enforce conditionality with a cash penalty for non-compliance. Cash penalty will be imposed if the beneficiaries fail to comply with the conditions. Beneficiaries will get warning on the first breach, a 10 percent cash penalty on the second breach, and removal from the programme on the third breach. PKH beneficiaries are also eligible to receive other social benefits, including education assistance for poor, community health insurance, and rice for the poor programmes. Third, the presence of field facilitators who were trained to advise household regarding conditionalities, including their rights and obligations and eligibility monitoring. Lastly, PKH is mostly implemented in supply-ready urban areas. Supply-readiness is assessed based on existing education and health facilities and infrastructure.

The target of the programme is poor households that were identified through a proxy-means test (PMT). The PMT has been used before in Mexican Progresa and Colombian Familia in determining poor households. PMT comprises 29 variables on assets and demographic characteristics including housing characteristics (construction materials), education attainment levels, sources of energy, types of employment and access to health and education services. The method aims to address the unobservable income problem, which targeted the lowest 7-10% of the population. The income of lowest income population is not recorded since the people mostly hold informal and precarious job. Sometimes they earn money but sometimes they do not earn any money.

The rank of welfare was determined using Proxy-means testing (PMT) model constructed using Susenas data (TNP2K, 2014), which statistically represents household characteristics in each city/district in Indonesia. In addition, the enumerators

also collected other households considered poor based on the referrals and consultation with neighbours and field observations. PMT is used to determine households' socio-economic condition based on household characteristics, namely the number of family members, education levels, housing conditions and assets owned. The method is confined to the PMT method widely used in other developing countries to rank household welfare.

Having been identified as eligible by PMT, each household should at least meet one of the following eligibility programme criteria:

1. Having expectant/nursing mother within the last 24 months
2. Having a child aged 0-5 and 5-7 who has not entered primary school
3. Having primary and secondary school-age child (7-15)
4. Having a child aged 16-18 who has not finished the mandatory 9-year basic education including children with disabilities

As a conditional programme, PKH links the programme benefits to the beneficiaries' compliance upon required conditions:

- School-aged children need to be enrolled in school
- School-aged children minimum monthly attendance rate is 85%
- Expectant/nursing mother minimum visit to subdistrict health facilities
- Toddlers and pre-school aged children are required to be present in subdistrict health service or monthly health facilities for growth monitoring

Table 4.1 shows the original plan for PKH location and participant from 2007 to 2014. When it was first launched in 2007, the programme target was the poorest 5% of the population. However, after 2011 the target was expanded to 25% of

Table 4.1: PKH participants and location by year of participation 2007-2013

Programs	Y_2007	Y_2008	Y_2009	Y_2010	Y_2011	Y_2012	Y_2013
Target benefiiaries	500000	642000	720000	816000	1116000	1516000	2400000
Realization	387974	620848	726376	774294	1052201	1492473	2326523
Additional participants		232874	105528	47917	277908	440272	834050
Number of provinces	6	13	13	20	25	33	33
Municials/Districts	48	70	70	88	166	166	333
Sub-Districts	337	637	781	964	1387	2001	3417

Note:
Source: Ministry of Social Affairs and National Team for Acceleration of Poverty Alleviation (2014).

the lowest income groups of the population, which makes the near-poor families were also included. In the expansion phase in 2012, PKH was implemented in all Indonesian provinces. The number of beneficiaries or PKH participants gradually increased to reach all the low-income families in poor households contingent upon the government financial ability. In 2014, 3.2 million beneficiaries from the poorest households were targeted.

With regards to implementation, monitoring and evaluation purpose, the Ministry of Social Affairs established PKH implementation unit or UP-PKH at the district level. Facilitators are the resources who work closely with the PKH beneficiaries in sub-district levels. The duties of facilitators ranging from programme socialisation, facilitation including holding monthly group meetings for validation and case reporting. Other resources in higher levels are districts/cities coordinators, region coordinators, district technical staff, province's staff and experts. The monitoring is performed using a computerised management information system (MIS) which had been gradually adopted by all sub-districts. The cash transfer is paid every quarter in February, May, August and November each year, while the prior two months are the data update and verification month followed by request month for beneficiaries with valid payment data.

Although PKH CCT is intended as a long-term programme, each household participation is expected to be up to six years or shorter if participating households

no longer meet the conditions (natural exit). For beneficiaries who do not exit naturally, they are expected to improve their behaviour towards education, health, and welfare. After six years, the participation will be recertified with data recollection.

Current PKH guidelines are designed to alleviate short-term poverty and, therefore, allow the removal of beneficiaries for three reasons:

1. They no longer satisfy eligibility conditions;
2. They are no longer poor; or
3. They have reached the time limit of six years as a recipient.

Exiting the programme because of the first reason is natural. For example, a beneficiary's child has completed nine years of education and hence will no longer receive support from PKH. However, the second reason is not that obvious because the programme needs constant monitoring to identify graduating/exiting households. A scheduled recertification activity can be an option for monitoring. There is another reason why exit by graduation due to income may also be problematic since some households' incomes fluctuate around the poverty line. Hence, the households are still very vulnerable to economic shocks. PKH should not graduate any household from the programme when there is a high chance that the household may fall below the poverty line again as they will be unable to support themselves after leaving the programme. The third reason for exiting the programme is the six-year limit, unless the households are recertified as still eligible to receiving the benefits.

4.3 Theoretical Background

The economic literature provides a rich discussion on the determinants of FLFP and the relationship between FLFP rates and economic development. Based on the theory of time allocation (Heckman, 1978; Killingsworth, 1983), a woman's

decision to join the labour force is the result of bargaining and collective decision-making process in the household. The time allocated to housework, paid work and leisure for the individuals are determined by maximisation of the household's joint utility function subject to the constraints it faces.

The research question will be addressed by applying the static labour supply theory. The basic static labour supply model is used in analysng FLFP with an application of basic consumer theory which comprises a substitution and income effect (Blundell and MaCurdy, 1999). The substitution effect results from an increase in the wage rate reducing the demand for leisure, thus increasing labour supply. The income effect results from an increase in non-labour income that increases the demand for leisure, assuming leisure to be a normal good, and thus reduces labour supply. In the static labour supply model, non-labour income is the sum of two components, asset income and other unearned income. This also works as an increase in non-labour income or income earned by another member of the household which creates income effect and therefore reduces labour force participation.

The neoclassical labour-leisure trade-off model provides the principal properties of labour supply. Labour supply is a non-monotonic function of wages. The principle suggests that labour supply increases when the wage is low, and it later diminishes as the wage is sufficiently high. The basic model, the notion that everybody has the possibility to allow trade-off between consumption goods and leisure arises from the traditional approach of labour supply. The analysis of choice between consumption and leisure enables identification of the labour supply determining factors both at the individual level and aggregate level, including family-level. Utility functions represent an individual's preferences for consumption and leisure trade-off.

Utility is defined over money spent on consumption and hours spent on leisure. Suppose an individual's utility function is $U\ (c,\ l)$, where c is consumption of goods and l is hours spent on leisure.

The budget constraints of the individual is given by:

$$c\ =\ wh\ +\ M \tag{4.1}$$

Consumption cannot exceed the total income comprises labour income, wh and nonlabour income, M. The total income can be spent on consumption or leisure.

The individual has total available of T hours per week to use for working, h and leisure, l.

$$\begin{aligned} T =&\ h\ +\ l \\ c =&\ w\ (T-l) +\ M \\ c =&\ wT\ +\ M -\ wl \end{aligned} \tag{4.2}$$

An individual problem is to maximise utility over consumption, c, and hours of leisure, l. The individual is endowed with unit of time, T, which represents the constraint of how to allocate to working h and leisure l. Let M represents the total unearned income available for consumption and w the real wage rate, then the optimal choice for c and l is given by the solution to the individual's problem subject to budget constraint in equation (4.1)

$$Max\ [U(c,l)\ |\ c - wh =\ M;\ c \geq 0;\ l \geq 0] \tag{4.3}$$

The maximisation problem is solved by maximising the Lagrangian:

$$max\ \Omega = U(c,l) +\ \lambda\ (wT + M - c - wl) \tag{4.4}$$

The first order conditions (FOCs) are

$$\frac{\partial \Omega}{\partial c} = U_c - \lambda = 0 \tag{4.5}$$

$$\frac{\partial \Omega}{\partial l} = U_l - \lambda w = 0 \tag{4.6}$$

$$\frac{\partial \Omega}{\partial \lambda} = wT + M - c - wl = 0 \tag{4.7}$$

The ratio of the FOCs in equations (4.5) and (4.6) provides an interior solution to the neoclassical labour-leisure model to meet the requirement that the marginal utilities ratio $\frac{U_l}{U_c} = \frac{MU_l}{MU_c} = w$.

The work hours decision determined by the solution to the constrained utility maximisation problem, an interior solution, a combination of consumption goods and leisure, the hours of work or labour supply decision in response to changes in the exogenous parameters, w and M. The questions formulated are: *What happens to labour hours when nonlabour income changes?* and *What happens to labour hours when hourly wage changes?*

Change in labour hours resulted from a change in hourly wage can be decomposed by the Slutsky equation into a substitution and income effects which can be derived by combining the constraints from the the FOCs in equations (4.5) to (4.7) with the second-order conditions of the maximisation problem. The neoclassical labour-leisure model with two choice variables, c and l can be rewritten as a single-variable maximisation problem without constraints. Assuming there is an interior solution, the individual's maximisation problem is:

$$\begin{aligned} max\ \mu = &\ U(c,\ l) \\ max\ \mu = &\ U(wT - \ wl \ + \ M,\ l) \end{aligned} \tag{4.8}$$

By choosing the amount of leisure, the individual maximises μ, which resulted the first-order condition:

$$\frac{\partial \mu}{\partial l} = U_c(-w) + U_l = 0 \tag{4.9}$$

Rearranging equation (4.9) yields the ratio of marginal utilities $\frac{U_l}{U_c} = w$. As a standard single-variable maximisation problem, the second-order condition (SOC) for maximum requirement is that the SOC, $\partial^2\mu/\partial l^2$ is negative.

$$\frac{\partial^2 \mu}{\partial l^2} = -w\ [U_{cc}(-w) + U_{cl}] -\ wU_{cl} +\ U_{ll} = \Delta < 0 \tag{4.10}$$

The Slutsky equation can be derived in three different steps. When nonlabour income M changes, holding the wage constant, find out what happens to leisure by using total differentiation of the FOC in equation (4.9). The FOC's total differentiation resulted from a change in M is:

$$-w\ U_{cc}\ [-w\ dl + dM] -\ w\ U_{cl}\ dl + U_{lc}[-w\ dl +\ dM] +\ U_{ll}\ dl =\ 0 \tag{4.11}$$

By rearranging the above equation resulting in the following equation:

$$\frac{\partial l}{\partial M}(holding\ dw = 0) = \frac{w\ U_{cc} -\ U_{lc}}{\Delta} \tag{4.12}$$

The sign of the above equation is still unknown although the denominator is negative. As previously defined, leisure is a normal good, then $dl/dM >\ 0$. Subsequently, to determine what happens to leisure if wage changes, holding nonlabour income constant, M which will theoretically move the individual's indifference curve. The individual will be better off if the wage increases and *vice versa*. FOC

in equation (4.9) is used to derive the expression for dl/dw and totally differentiate the equation, holding nonlabour income constant, will result the following equation:

$$\begin{aligned}\frac{\partial l}{\partial w}(holding\ dM=0) &= \frac{U_c}{\Delta} + h\ \frac{w\ U_{cc} - U_{cl}}{\Delta} \\ &= \frac{U_c}{\Delta} + h\ \frac{\partial l}{\partial M}(holding\ dw=0)\end{aligned} \tag{4.13}$$

The effect of hourly wage change on the leisure amount can be written as the sum of two terms from the above equation with the first term must be negative since $U_c > 0$ and $\Delta < 0$, and the second term is positive under the assumption that leisure is a normal good. The first term in equation (4.13) demonstrates the substitution effect, while the second term demonstrates the income effect. The substitution effect quantifies the change in the demand for leisure when wage changes and the individual has to stay on same indifference curve at the utility of U^*. The individual can stay on the same indifference curve after a wage drop if the individual is compensated for the loss through an increase in nonlabour income to keep utility unchanged.

The amount of compensation can be solved by holding utility constant, in other words, if the wage change, how much nonlabour income need to change to stay at the same indifference curve? When both w and M change, holding utility constant, the equation (4.13) is differentiated resulting:

$$U_c\ [h\ dw + \ dM] = \ 0 \tag{4.14}$$

Thus, $dM = -h\ dw$ is the compensating change in M.

The equation (4.13) can be rewritten as the following the Slutsky equation for labour supply:

$$\frac{\partial h}{\partial w} = \frac{\partial h}{\partial w}|_{U=U*} + h\ \frac{\partial h}{\partial M} \tag{4.15}$$

The first term in equation (4.15) is the substitution effect, as the denominator in equation (4.13) is negative, a wage increase makes leisure relatively more expensive, thus the individual reduces the quantity of leisure and increase the labour supply hours. The second term is the income effect which sign is negative if leisure is a normal good.

Turning to previous studies on female labour supply, Mincer (1962) contributed two original ideas to female labour participation and income relationship. First, the female choice is not only between leisure and paid work, but also home production or family chores. Secondly, Mincer (1962) based on Friedman's consumption theory, claims that people adjust their consumption to their permanent income, instead of current income. The results of his cross-sectional studies also showed a negative relationship between female labour participation and husband's income, and a positive relationship between female labour participation and her earning's power. However, the higher the husband's education, the more likely the wife will enter the labour force. Mincer's findings also support his hypothesis that a woman is keen to work when the husband's income is less than permanent income, and in this case, her labour force response to the transitory income is stronger than to permanent income. The woman labour force response is weaker as the husband's education is higher.

Mincer and Polachek (1974) in Blau and Kahn (2007) analysed gender differences in qualifications using human capital model. They argue that compared to men, women tend to accumulate less labour market experience. In addition, due to the traditional role of women, they anticipate shorter and discontinuous work life, thus women have lower incentives in investing in formal education and training. The women's lower investments in human capital which will in turn lower their earnings compared to those of men. Also, Blau and Kahn (2007) argued that the more hours women spend in housework, may reduce their effort in the job market, which could decrease productivity and wages.

There is considerable empirical evidence to suggest a U-shaped relationship of FLFP with the process of economic development (Kottis, 1990, Schultz, 1991 and Tam, 2011). The evidence of a U-shaped relationship is based on the historical experience of developed countries and in multi-country studies. In the United States, the pattern is U-shape, FLFP fell during the initial stages of economic growth and began to rise later as its growth continued (Goldin,1995). Mincer (1985), Pampel and Tanaka (1986) argue that high-income and low-income countries have the highest FLFP, while middle-income countries have the lowest.

In the emerging of industrial and service sectors, women may not be able to compete with men due to their lower educational attainments. Social customs or employers' preference may also deter women's employment in the manufacturing sector. Women may also be held back by tradition, culture and household responsibilities (Klasen and Pieters, 2015). Conversely, as women's education improves and their wages relative to the price of goods rise, their participation in the labour force increases. Goldin (1995) and Tam (2011) consider the income effects (change in labour supply as household income changes) and substitution effects (female wages change but income remains constant) that contribute to the U-shaped pattern. The declining part of the U-shaped curve suggests that a strong income effect dominates. In the rising part, the substitution effect of higher wages dominates the small income effect (Mincer, 1962; Killingsworth and Heckman, 1986; Goldin, 1995).

Labour supply models and previous research on FLFP and economic development (Mammen and Paxson, 2000; Blau and Kahn, 2007) argue that higher education and growth in white-collar services employment would give more incentive for women to enter the labour market. While, on the other hand, a rise in household income works as income effect that would lead to female withdrawal from the labour market. Several studies also show a U-shaped relationship between FLFP and per capita income level (Mammen and Paxson 2000). Tansel (2001) argues that education significantly affects an individual's decision to participate

in the labour market (extensive margin) and also in deciding how many hours to supply (intensive margin) in the labour market. In Japan and Korea, there have been significant increases in female educational attainment levels in the past. Notwithstanding, FLFP remains low despite the higher-level education of women.

4.4 Previous Studies on Conditional Cash Transfer Programmes

Conditional cash transfer (CCT) is one of the most adopted social assistance programs worldwide within the last two decades (Fiszbein et al., 2009). There has been substantial growth in social safety programs in developing countries and the wealthier a country becomes, the more social insurance as a fraction of GDP increases (Chetty and Looney, 2007). The development in CCT programmes worldwide was motivated by the success of the Progresa programme in Mexico (1997). Progresa was one of the first large-scale conditional cash transfer programmes in the world.

Most of the CCTs aimed at reducing consumption poverty and encouraging investments in children's health and education. Turning to evidence from previous studies on the impact of conditional cash transfer programmes on adult labour participation and on health and education outcomes. Fisbein and Schady (2009) found the CCT programmes had positive effects on household consumption and on poverty reduction, with the largest consumption effects were found in Nicaragua where the transfer amount was generous and poverty fell by 5-9 percentage points. Although there was a concern when CCTs were first launched that they would reduce labour market participation because beneficiaries would like to appear poor enough to stay eligible or because they would choose to consume more leisure at higher income levels, the evidence did not support the concern. The results on Cambodia, Equador and Mexico showed that adult beneficiaries did not reduce their work due to the CCT programmes. Instead, CCTs had led to considerable

reduction in child labour as found in Brazil, Cambodia, Equador, Mexico and Nicaragua. In Cambodia, CCT successfully reduced child who worked for pay by 10 percentage points (Fisbein and Schady, 2009). Other findings are CCTs had a small impact on fertility in the short-run in Honduras by 2-4 percentage points, because of the requirement that new households could be registered if they gave birth to a child, and the transfer amount depended on the number of young children (Stecklov et al., 2006). CCTs did not have impacts on remittance crowding out (Teruel and Davis, 2000) or increase in prices or wages (Angelucci and de Giorgi, 2009).

De Janvry et al. (2006) studied Progresa using panel data and test whether conditional cash transfer programmes can serve as safety nets for children school enrolment and preventing from child work. They developed a household school enrolment and child work decision model. The model accounts for schooling as a programme condition and then looks at the response to shock exposure and the programme potential mitigating effect. The results suggest that school enrolment as one of Progresa conditions substantially secured children from shocks. However, the programme failed to prevent child work from increasing further exposure to family income shocks. If schooling is a normal good, demand for schooling increases with income. School subsidy relaxes credit constraint thus allowing poor families to invest more in schooling (Schultz, 2004). Schultz (2004) estimates child labour supply with instrumental variable assuming school enrolment is exogenous. The IV estimates suggest that enrolment had significantly reduced child work. There are no consistent and statistically significant effects on fertility within short-term.

Schady and Araujo (2006) analysed the impact of cash transfer programme, Bono de Dessarollo Humano (BHD) on school enrolment and child work among poor children in Equador using a randomised design. They found the programme had a pronounced positive impact on school enrolment and a negative impact on child work, 10 and minus 17 percentage points, respectively. Additionally, the existing belief among households that the programme was conditional upon enrolment.

Although the condition was never enforced, it could explain the programme effect size. Behrman et al. (2005) employed a Markov model of schooling transitions to assess the impact of Progresa school subsidy programme. A Markov model of school transitions utilised to empirically differentiate various of programme impacts comprising effects on early age of school entry, dropout rates, grade repetition rates, and school re-entry rates among the dropouts. They found that the programme participation results in higher enrolment rates, less grade repetition and improved grade progression, lower dropout rates and higher school re-entry rates among dropouts. Most importantly, the programme had impact in lowering dropout rates during the transition from primary to secondary school.

Other study found that CCTs led to a significant increase in the use of education and health services (Fisbein and Schady, 2009). School enrolment rates among beneficiaries had increased in Mexico, Honduras, Nicaragua, Bangladesh, Cambodia and Pakistan and reduced gender gap in enrolment rates in Bangladesh, Pakistan and Turkey (Khandker, Pitt, and Fuwa, 2003; Filmer and Schady, 2008; Chaudhury and Parajuli, 2008).Gertler (2000) and Gertler (2004) found that the social transfer programmes have positive effect on access to health services, while Schultz (2004) found that cash transfer improved education outcomes.

Despite the positive impacts, studies in developed countries show some of the transfer programmes have a negative impact on labour supply (Atkinson, 1987; Ashenfelter and Plant, 1990; Krueger and Meyer 2002; Moffit, 2002). Ashenfelter and Plant (1990) studied the labour supply responses to a negative income tax programmed from Seattle and Denver Income Maintenance Experiments. It was found that the experimental treatment resulted in incentive effects working to reduce labour supply (Ashenfelter and Plant, 1990). Moffit (2002) found that US federal assistance program, Aid to Families with Dependent Children (AFDC), reduced labor force participation by 10 to 50 percent which was attributed to its implicit tax on income.

On contrary, in developing countries there is no evidence that the cash transfer programmes affecting adult labour participation (Parker and Skoufias, 2000; Skoufias and Di Maro, 2008; Filmer and Schady, 2009; and Edmonds and Schady, 2012). Parker and Skoufias (2000) studied the disintentive effect of Mexican Progresa on labour supply and found no evidence that the programme reduced adult labour participation. Skoufias and Di Maro (2008) examined the impact of Mexican Progresa on adult labour participation in the labour market along with adult leisure time and relate the programme's impact on poverty. They employ the Progresa evaluation of sample's experimental design and find no significant impact on adult labour force participation and leisure time. In addition, Progresa outcomes of poverty reduction support adult work incentives. Edmonds and Schady (2008) found that the CCT programme in Ecuador had no effect on adult labour supply. Study on impact of Cambodian CCT found that the programme did not have significant impact on adult labour supply (Filmer and Schady, 2009).

Banerjee et al. (2015) studied seven CCT in six developing countries; Honduras, Morocco, Phillipines, Mexico PAL, Indonesian PKH, Nicaragua, and Mexican Progresa. Using randomised controlled trial data, they performed difference-in-differences regressions. The results suggested small and negative insignificant programme effects on work outcomes ranging from the lowest 0.4 to 2.8 percentage points. Overall, by pooling the the CCT programmes, the finding suggested a small reducation in work hour of 0.25 hours per week. In the case of Indonesia, the estimate was 0.7 percentage points of reduction in work probability for men but statistically insignificant and a negligible positive effect (0.006 percentage points) for women.

Turning to evidence with different direction, a study in Nicaragua showed that RPS had a significant negative effect in hours worked of adult men by about six hours, with no effect among adult women (Maluccio and Flores, 2005). Foguel and Barros (2010) studied the effect of Brazilian Bolsa Familia on adult labour

supply and found that the programme slightly increased working probability by 1 percentage point and 2-3 percentage points for women and men, respectively. However, with regards to labour hour, the programme reduced labour hour by 0.6-2.6 hours and 0.6-1.6 hours per week for women and men, respectively.

Aguiar and Filho (2016) looked at the impact of Brazillian Bolsa Familia programme on the Brazilian labour participation. They analysed the data from Brazil Family Budget Survey using Seemingly Unrelated Bivariate Probit Model and Instrumental Variable and found that Bolsa Familia had a strong and negative effect on the probability of being employed in the labour market. The Brazillian Bolsa Familia had a negative effect on the likelihood of being employed for the head of the family and partner by 24 percentage points and 86 percentage points by the spouse, respectively.

As a conditional programme, a CCT is expected to work when the beneficiaries comply with the conditions. If conditionality exists but programme recipients expect that will not be enforced, it will be the same as an unconditional programme. A study by Brollo, Kaufmann and La Ferrara (2017), using Bolsa Familia programme investigates how CCT programme conditionality enforcement can affect programme recipients' behaviour. The programme is conditional on beneficiaries' school-aged children school attendance of 85% of monthly school days. Recipients' failure to comply with the requirement results in receiving warning up to five times and increasing penalty's severity. The study analysed whether people respond to Bolsa Familia's conditionalities enforcement by improving school attendance and whether there is learning process on enforcement quality from peer's experience. The study findings are; school attendance increases after penalties are imposed to the families for past non-compliance to conditionalities. Families also respond to penalties experienced by peers, i.e. children's classmates experienced enforcement.

In the latest study evaluating the PKH programme and using the same dataset, Cahyadi et al. (forthcoming) found that the program has a long-term effects in

increasing the childbirth attended by trained health professionals and reduced children aged 7-15 share who are not enrolled in school, and reduced child labour wages by one third for children aged 13-15. This chapter contributes to the literture by evaluating PKH programme impact on female labour participation and fertility as the programme unintended effects.

4.5 Data

The study employs randomised controlled experiment data from the World Bank and the National Team for Acceleration of Poverty Reduction (TNP2K). The data used for Indonesia CCT programme, PKH is from obtained from Survey Pelayanan Kesehatan dan Pendidikan (SPKP) or Health and Education Service Survey from the World Bank (`http://microdata.worldbank.org/index.php/catalog/1047`) and published data from the National Team for Acceleration of Poverty Reduction (TNP2K). The survey consists of three waves of household surveys conducted by the World Bank and an endline survey conducted by TNP2K in 2013. The baseline survey was conducted in 2007, the second wave survey and the third wave survey were conducted in 2008-2009 and in 2009-2010, respectively. The end-line survey was conducted in 2013 by the National Team for Acceleration of Poverty Alleviation/TNP2K.

4.5.1 PKH Randomisation Process

The baseline survey (2007) was designed as randomised controlled trial (RCT) in six provinces; DKI Jakarta, West Java, East Java, North Sulawesi, Gorontalo and East Nusa Tenggara (NTT). The provinces were selected to represent Indonesia's diversity which have varying characteristics of high, medium and low porverty rates, urban and rural areas, and coastal and island (Sparrow et al., 2008).

The wealthiest 20 percent of districts in each province were excluded from PKH CCT programme, which determined by the districts' poverty rates, malnutition incidence, and primary to secondary schooling transition rates.

The randomisation was carried out across eligible sub-districts level or *kecamatan* out of 80% poorest districts (Sparrow et al., 2008). Selection criteria for eligible sub-districts were based on special characteristics, including the prevalence of malnutrition, poverty rate, school drop-out rate, and availability of health and education facilities. Originally, 329 and 259 subdistricts were randomly drawn as treatment and control subdistricts. Then, from randomly assigned treatment subdistricts, 180 were randomly selected to receive the program treatment. Additionally, 180 were randomly selected as control subdistrics. Treatment and control sample subdistricts were stratified by urban and rural category as part as the sampling strategy.

From each sample sub-district, five villages were randomly selected and households were randomly sampled based on PKH beneficiary's criteria. Two from group of household with expecting/nursing mother or married women who were pregnant within the last two years and three from group of households with children aged 6-15 years were selected from each village. Finally, over 14,326 households were selected for interview in the baseline survey in 2007 which comprises 7,195 treatment households and 7,131 control households. In the follow up survey, the attrition rate was about 2.5% or 350 fewer panel households, leaving 13,970 households in 2009. In the second follow up survey, there were 13,619 households in 2013 or 4.9% overall attrition rate from baseline survey with the attrition rates almost identical accross treatment and control groups (Cahyadi, et al., 2018).

The variable for labour participation is obtained from the question of worked last week. The response to the question 'What is the main activity performed last week?' with options of (1) employed, (2) attend school, (3) look after school household, (4) retired, (5) unemployed, (6) under 5, (7) other. Dummy for working

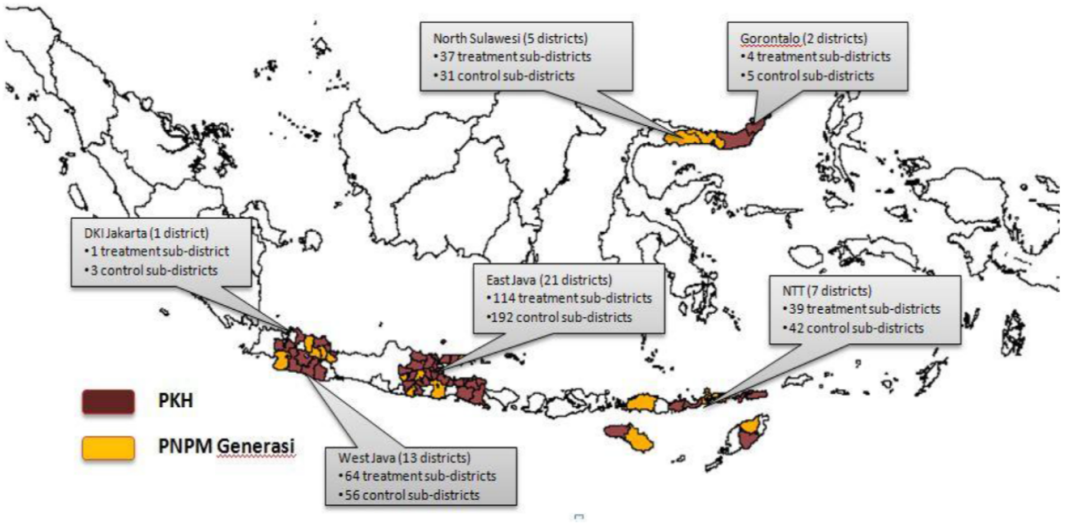

Figure 4.2: Map of district piloting the household CCT, PKH

is coded 1 for those answering (1) employed and 0 otherwise. This paper uses a panel of about 14,000 individual females age age restricted to between 16 and 49 years old from baseline data 2007, with follow up surveys in 2009 and 2013.

Figure 4.2 shows the map of the plan for district piloting in 2017, of the six provinces receiving PKH and surveyed for impact evaluation purpose. In terms of randomisation process, 769 sub-districts were randomly selected as PKH treatment areas. Treatment area samples were then randomly selected and stratified by urban/rural classification to get 180 sub-districts. PKH control area samples of 316 sub-districts were randomly drawn, and then 180 sub-districts control areas sample were randomly selected. In each the treatment sub-district, 40 households were randomly drawn, and around 20 households were assigned for treatment, and the rest are the control households. Whereas in control-district, 40 households were randomly chosen as control households (Satriawan, 2016).

Table 4.2 lists the questionnaire modules which comprise household core, school-aged children core, babies and toddler, home-based tests scores data, village characteristics, subdistrict health centres, midwives, primary schools, junior secondary school data, and village health service staff.

Table 4.2: Survey questionnaire modules

Modules	Information_Contents
Household	Respondent: Female household head or spouse of a male household head. Household roster, deaths of household members in the past 12 months, migration, water, receive of government social assistance programmemes, participation in non-formal education, consumption, assets, morbidity, outpatient care use.
Mothers	Respondent: Mothers aged 16-49 years. Fertility history, access to healthcare services during pregnancy, family planning, health and education knowledge.
Children	School-aged children. Children aged 6-15 years. Respondent: mother of the child. School enrolment, attendance, cost of schooling, education assistance, child labour.
Babies and toddler	Children aged less than 3 years. Growth monitoring, immunisation records, moto development, nutritional intake.
Home-based tests	Math test and reading skills administered at home (separate test for aged 6-12 and 13-15).
Village characteristics	Respondent: village head. Demography of the village, village information, access to health services and schools, economic shocks, community participation, daily wage rate
Community Health	Community Health Centers (Puskesmas). Head of facility information, coverage area, budget, staff roster, time allocation of lead doctor and midwives coordinator, services provided, fee schedule, number of patients served during the last month, medicines and vaccine stock, data on village health staff, direct observation on facility cleanliness and hygiene
Village midwives	Personal qualification and background, location of duty, condition of facility, time allocation, income, services provided, fee schedule (public and private), experiences during past three deliveries, number of patients during the last month, equipment and tools, medical supplies and stock, village post management, structure of subsidies received.
Schools	Principal qualification and background and time allocation, teacher roster, school facilities, teaching hours, enrolment records, attendance records, official test scores, education assistance, fees, budget, direct observations of classrooms and random check on classroom attendance.

Note:
Source: World Bank, 2011.

4.5.2 Descriptive Statistics of Baseline Data 2007

The descriptive statistics are obtained from the 2007 baseline data. One of the target criteria to receive CCT program was receiving the previous unconditional cash transfer (UCT) in 2005. In 2007, the number of households received UCT was 14,235 and the number of households not receiving UCT was 12,922. The unconditional cash transfer recipient number was used as consideration to survey villages for PKH. In terms of the conditions for the transfers programme, in 2007 there are 5,178 or 38.87% households with expectant mothers within the last 24 months, 6,902 or 51.81% households with children up to 15-year of age and the remaining 1,243 or 9.33%of households do not have expectant mothers nor children less than 15-year old.

Table 4.3 shows the balance tests between treatment and control group. The average household size is 5.17 for treated group, is not significantly higher than that of the control group, 5.12. The average age of the treated female beneficiary is marginally higher (38.5 years) than that of control group (38.2 years). In terms of female labour participation, there is no significant difference between average worked last week for treatment and control group, 34.6% and 34.3%, respectively. The variable for labour participation is using the question of whether the individual worked last week, using dummy of 1 for working and 0 otherwise.

Both groups have a similar average years of education completed about 8 years, although the treatment group has slightly lower education. For the housing materials, brick wall is dummy for wall material, which takes the value of 1 if for brick/concrete wall. The treated group is slightly worse than the control group with respect to wall materialss. Similarly, the treated group is slightly worse than the control group for floor material and cooking fuel sources.

In figure 4.3, the 2007 to 2013 data show the U-shape or feminization-U hypothesis. As the education level completed increases from no education to middle school,

Table 4.3: Balance Test of Groups' Characteristics for Baseline Data 2007

	Treatment		Control				
Variables	Mean	N	Mean	N	Difference	SE	p-value
Household size	5.12	7,074	5.17	7,153	-0.04	(0.029)	0.1360
Age	38.52	7,074	38.24	7,153	0.29*	(0.173)	0.0940
Work	34.65%	7,074	34.37%	7,153	0.002	(0.008)	0.7280
Marrital status	0.931	7,074	0.932	7,153	0.001	(0.005)	0.8540
Wall type	0.439	7,074	0.456	7,153	-0.016**	(0.008)	0.0470
Roof type	0.700	7,074	0.705	7,153	-0.005	(0.007)	0.4790
Floor type	0.539	7,074	0.573	7,153	-0.033***	(0.008)	0.0001
Water source	0.785	7,074	0.771	7,153	0.013*	(0.006)	0.0540
Electricity	0.866	7,074	0.868	7,153	-0.002	(0.005)	0.6840
Cooking fuel	0.193	7,074	0.219	7,153	-0.026***	(0.006)	0.0001
Insurance	0.514	7,074	0.520	7,153	-0.006	(0.008)	0.4620
Java ethnicity	0.369	7,074	0.379	7,153	-0.01	(0.005)	0.4184
Years of education	8.18	7,074	8.39	7,153	-0.21**	(0.104)	0.0180

Note:
The results are balance test of characteristics of female aduts aged 16-64 with total sample of 14,227 whose role as household's head spouse or female household head aged between treatment and control groups calculated by employing PKH Baseline Data 2007

female labour participation decreases. Conversely, as education level completed increases from middle school to diploma or graduate, the female labour participation increases again. Overall, female labour participation of the household's wife and female household head is lower at around 17.15%.

4.6 Empirical Strategy

The overall determinants of female labour participation will be modelled with economics theory of utility. A woman maximises a family utility function, a function of a bundle of goods consumed and the time spent on leisure by every household member. The maximization problem faced by the woman with a role as a spouse or household head is constrained to the total income earned by the family. Observable factors influencing the decision of a woman to work are age,

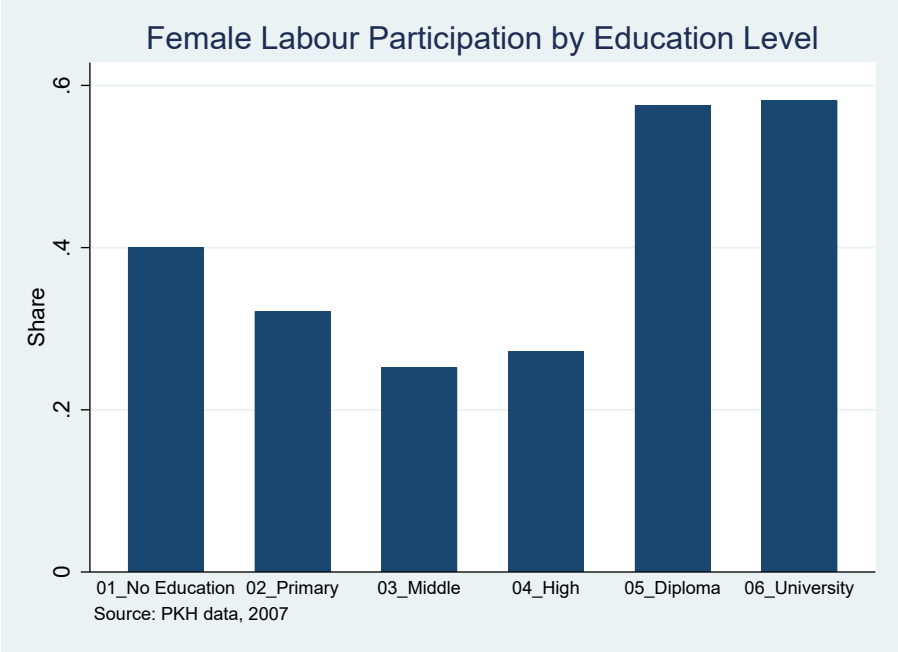

Figure 4.3: Female Labour Force Participation Rate by Education Level

education level, number of children as well as social status. Spouse education level also affects a woman's decision to work as a substitution effect.

This chapter also hypotheses concerning the mechanism by which the role of women as house managers have empowerment effect, in terms of authority, may increase motivation to work. With respect to female authority in household decision making process. The study will estimate female labour force participation using a regression model of individual level panel data and household variables.

The identifying assumption is that the female labour participation would be the same in treatment and control areas in the absence of treatment or the parallel trends assumption. The intervention is the conditional cash transfer programme which given to the treatment group after all the eligible households were identified as explained in the data section. A baseline household survey in both participating and non-participating sub-districts was conducted in 2007 based on criteria mentioned earlier with the Proxy Means Testing method. The same households were resurveyed in 2009 which produced the full panel in 2009. In 2013, the households were resurveyed with 4.9% attrition rate.

The treatment assignment was implemented through randomised treatment allocation after eligible sub-districts were chosen. The randomisation was performed at subdistrict level and houshold level, the probability to be selected as treatment areas across eligible subdistricts is the same, thus receiving the programme must be orthogonal to expected outcomes (Satriawan, 2016). Therefore, eligible households who do not receive the cash transfer are able to serve as valid counterfactuals. This distinct difference for actual treatment is obtained using one of the survey questions *Do you receive PKH CCT?*

4.6.1 Difference-in-Differences Specification

In evaluating whether there is an impact of the PKH CCT on female labour force participation, the impact is measured using the difference-in-differences specification using two different types of effects, placement effect and participation effect.

The randomisation of treatment assignment lottery is such that the group of eligible households in the subdistricts initially scheduled to receive PKH (lottery $L = 1$) and the group of eligible households in those subdistricts initially scheduled not to receive PKH (lottery $L = 0$). K is the actual treatment status whether the subdistricts received the cash transfers or not, $K = 1$ if a subdistrict is a treatment subdistrict and 0 otherwise.

Placement effect or intent-to-treat (ITT) estimate compares the outcomes between all surveyed eligible household in scheduled treatment areas $L = 1$ (regardless whether they receive the programmeme or not) with eligible households who are scheduled not to receive the transfer in control areas $L = 0$. Participation effect is the outcome difference between actually treated groups in treatment subdistricts and control groups (the counterfactuals) in control subdistricts. The observations who finally untreated in treatment areas or $L = 1$, $K = 0$ and those who receive treatment in control areas or $L = 0$, $K = 1$ are dropped to obtain this estimate. Using the difference-in-differences specification by comparing the female labour

participation from households who actually receive PKH ($D_i = 1$) in treatment areas with outcome that of non-PKH households ($D_i = 0$) in control areas. ITT compares individuals in relation to whether they were offered treatment which comparison is based on randomly assigned treatment (Angrist and Piskhe, 2008). The average treatment effect is:

$$ATE = E[Y_{1i}|D_i = 1] - E[Y_{1i}|D_i = 1] - (E[Y_i|D_i = 1] - E[D_i = 0, t_i = 0] \quad (4.16)$$

Individual baseline and endline data are used to estimate the following difference-in-differences specification

$$Y_{it} = \alpha Post_t + \beta Post_t D_i + \gamma_i X_{it} + \mu_s + \epsilon_i \quad (4.17)$$

- $Y_{it} = 1$ if individual i participating in the labour market in time period t, and zero otherwise
- β is parameter of interest which provides the difference-in-differences estimate in work outcomes between the treated and control group, or participation effect
- $D_i = 1$ if individual household receives PKH treatment, and zero otherwise
- $Post = 1$ is for post-treatment year, in this case year 2009 or 2013, and zero for 2007 baseline
- $Post_t * D_i$ is Interaction variable for difference-in-differences estimate
- μ_s = subdistrict fixed effect.
- X_{it} is control variables to increase precision, household size, own age, age squared, dummy whether the female has child age less than 6 years old, years

of education, marital status dummy, dummies for house materials: wall, rood and floor and log of monthly expenditure

- ϵ_{it} is unobserved idiosyncratic shocks

The following equation (4.5) is intent-to-treat specification which is essentially difference-in-difference for placement effect with sub-district original treatment assignment in 2007 as the treatment status.

$$Y_{it} = \alpha Post_{it} + \beta Post_t Ti + \gamma i X_{it} + \mu_s + \epsilon_{it} \tag{4.18}$$

where:

- $Y_{it} = 1$ if individual i participating in the labour market in time period t, and zero otherwise
- $T_i = 1$ if the individual lives in treatment areas, and zero otherwise
- $Post = 1$ is for post-treatment year, in this case year 2009 or 2013, and zero for 2007 baseline
- β = Parameter of interest which provides the difference in work outcomes between individuals in treatment and control sub-districts, intent-to-treat or placement effect
- $Post_t * T_i$ is interaction variable for intent-to-treat estimate
- μ_s = sub-district fixed effect
- X_{it} is control variables to increase precision, household size, own age, age squared, dummy whether the female has child age less than 6 years old, years of education, marital status dummy, dummies for house materials: wall, rood and floor and log of monthly expenditure
- ϵ_{it} is unobserved idiosyncratic shocks

4.6.2 Identification Strategy: Instrumental Variable

In the midline survey by World Bank in 2009, it was found that there has been conversion in the sample for both sides non-compliance. Out of 180 treatment sub-districts, one treatment sub-district never received the programme due to supply side issue, the programme was never implemented in two subdistricts because the District head refused to participate in the pilot programme for randomly selected subdistricts only. Households had to abide with the head of the District decision who refused the program treatment. There are 39 out of 180 control sub-districts received the programme. When there is contamination, one can no longer sure that receiving the programme is orthogonal to expected outcomes.

Although compliance with the treatment randomisation was generally high, there were 39 control subdistricts that finally became treated subdistricts. The non-compliance issue requires additional efforts for identification. Instrumental variable technique will be employed to deal with both sides of non-compliance issue. Since randomisation is no longer perfect, as there were some treatment areas decided not participate, and there were some control areas that were finally treated. Subsequently, the households within treatment subdistricts were randomised for receiving the treatment using treatment/control assignment. From the household treatment assignment, it can be distinguish who was supposed to receive the treatment and who was not.

If the randomisation works, subdistrict receiving PKH ($K = 1$) if assignment lottery $L = 1$ and subdistricts not receiving PKH ($K = 0$) if assignment lottery $L = 0$. Non-compliance occurs when the subdistrict is supposed be treated ($L = 1$) but became control ($K = 0$), or the subdistrict is supposed be a control ($L = 0$) but became treated ($K = 1$). Outcomes of households who actually receive PKH ($D_i = 1$) are compared with outcomes that of actual non-PKH households ($D_i = 0$). The actual received of treatment is instrumented using the original treatment

assignment lottery status of household. The information on actual received of treatment ($D_i = 0$ or $D_i = 1$) in 2009 and 2013 is obtained from response to survey question *Do you receive PKH CCT?*.

$$Y_i = \alpha_0 + \delta S_i + \gamma_i X_i + \mu_s + \epsilon_{it} \tag{4.19}$$

where :

δ is the coefficient of interest or the IV estimator.

- First stage

$$S_i = X'\pi_{10} + \pi_{11} z_i + \xi_{1i} \tag{4.20}$$

- Reduced form

$$Y_i = X'\pi_{20} + \pi_{21} z_i + \xi_{2i} \tag{4.21}$$

$$\delta = \frac{\pi_{21}}{\pi_{11}} = \frac{cov(y_i, z_i)}{cov(s_i, z_i)} \tag{4.22}$$

where:

- $Y_{it} = 1$ if individual i participating in the labour market in time period t, and 0 otherwise
- $S_i = 1$ if the household actually receive PKH programme, and 0 otherwise
- z_i = the instrument, the original treatment assignment
- X_i= control variable for changes in household size and composition, own age, dummy whether the female has a child aged less than six years old, own education and marital status
- ϵ_{it} is unobserved idiosyncratic shocks, are assumed to be randomly distributed

4.7 Empirical Results

4.7.1 Short-run Effect of CCT on Female Labour Participation

Regression Results from Panel 2007 and 2009

Several regressions were performed on whether the female work as dependent variable using OLS and panel difference-in-differences. The sample used is ever married female adults aged between 16 and 64 whose role either as household head's spouse or the household's head. The dependent variable is worked last week, a dummy that takes the value of 1 for working and 0 otherwise. The independent variable is whether the household is a PKH programme treatment or control group and several household and individual-level control variables, household size, age, age squared, a dummy for the level of education completed, a dummy for marital status and log of consumption per capita. For the panel regression, subdistrict fixed effect is used. Standard errors are clustered at the randomisation unit, sub-district level.

PKH programme short-run impact on female labour participation evaluated using difference-in-differences specification is presented in Table 4.4. The table shows the PKH programme impact by comparing the difference in labour participation using difference-in-differences specification between groups in treatment areas as treated and groups in control areas as counterfactuals.

Table 4.4 shows the programme impact in the short run, difference-in-differences (DID) specification in columns. Column 2 presents the DID estimate of PKH using specification in equation (4.18). All the estimates including DiD show that there is small negative programme effect on work outcomes of the mothers between 1 to 1.6 percentage points but not statistically significant. These results are in line with the findings on CCT programmes in Mexico, Honduras and Nicaragua by Alzua et al. (2013).

Table 4.4: Difference-in-Differences Estimate of CCT Programme on work outcomes in 2009

	DiD	
Work	without covariates	with covariates
Post	0.081***	0.129***
	(0.010)	(0.020)
Treatment effect	-0.0106	-0.014
	(0.020)	(0.020)
Control Mean	0.347	0.347
Control	No	Yes
No. of Obs.	24526	24514
R-Squared	0.017	0.03

Note:
The table is a result of cash transfer impact on a dummy for worked last week with control variables are household size, dummy for having child age <6 years, age, age squared, level of education completed, marital status dummy and household characteristics dummies. The sample is female adult between 16 and 64. Standard errors clustered at sub-district are reported in parenthesis. *p<0.1, ** p<0.05, *** p <0.01.

PKH programme short-run impact on female labour participation evaluated using intent-to-treat specification is presented in Table 4.5. The table shows Table 4.5 shows the intent-to-treat (ITT) estimations or placement effect which compares the outcomes between all surveyed eligible household in the scheduled treatment areas $L = 1$ (regardless whether they received the programme or not) with eligible households who were scheduled not to receive the transfer in control areas $L = 0$.

Column 2 presents the intent-to-treat estimate of PKH analysed using equation (4.18). The ITT estimates in columns 1 and 2 show that the CCT program is small (-0.07 percentage points) and not statistically significant in affecting females' work outcomes. These results also reflect similarities with findings obtained by Alzua et al. (2013).

PKH programme short-run impact on female labour participation evaluated

Table 4.5: Intent-to-Treat Estimates of CCT programme impact in 2009

	ITT	
Work	without	with covariates
Post	0.0728***	0.110***
	(0.012)	(0.014)
ITT	-0.0097	-0.0071
	(0.017)	(0.017)
Control Mean	0.347	0.347
No. of Obs.	24526	24514
R-Squared	0.0131	0.0244

Note:
The table is a result of cash transfer impact with intent-to-treat using original treatment assignment on a dummy for worked last week with control variables are household size, dummy for having child age <6 years, age, age squared, level of education completed, marital status dummy and household characteristics dummies. The sample is female adult between 16 and 64. Standard errors clustered at sub-district are reported in parenthesis. *p<0.1, ** p<0.05, *** p <0.01.

using instrumental variable techniques is presented in Table 4.6 and Table 4.7. Table 4.6 shows the first-stage IV regression using equation (4.20). The table shows the first-stage IV regression results, in which receiving PKH programme in the year 2009 is instrumented with the original treatment assignment in 2007. The first-stage regression, column 2 shows the likelihood the individual's household receive PKH if the household was assigned as treatment household in 2007 is 38.8% and significant with F-statistics of 272. Thus, the original treatment assignment, *assign*, is a valid instrument for actual treatment in 2009.

Table 4.7 presents estimates of the CCT programme impact using instrumental variable technique. Column 2 shows the effect of PKH using equation (4.19). From columns 1 and 2, using IV estimates without and with covariates, the estimates are similar to the ITT effect (-1.4 to -1.8 percentage points) and are not statis-

Table 4.6: First-stage IV Regression with covariates with original treatment assignment as instrument for actual treatment in 2009

Outcome: Ever received PKH	without covariates	with covariates
Treatment effect	0.392***	0.388***
	(0.007)	(0.007)
No. of Obs.	12,263	12,263
R-squared	0.186	0.022
F-statistics	2823.31	272.07

Note:
The table reports first-stage regression of PKH programme status whether Ever received PKH based on original treatment assignment. The instrument is original treatment assignment. Control variables include household size, dummy for having child age <6 years, age, age squared, level of education completed, marital status dummy. The sample is female adult between 16 and 64. Standard errors clustered at sub-district level are reported in parenthesis. * p<0.1, ** p<0.05, *** p <0.01.

Table 4.7: Instrumental Variable Estimates of CCT programme impact in 2009

Outcome: Ever received PKH	without covariates	with covariates
Treated	-0.014	-0.018
	(0.022)	(0.022)
Control Mean	0.347	0.347
No. of Obs.	12,263	12,263
R-squared	0.002	0.071

Note:
The table is a result of IV regression on receiving PKH programme impact on a dummy for worked last week with control variables are household size, dummy for having child age <6 years, age, age squared, level of education completed, marital status dummy and household characteristics dummies. The sample is female adult between 16 and 64. Standard errors clustered at sub-district are reported in parenthesis. * p<0.1, ** p<0.05, *** p <0.01.

tically significant.

In the short-run, the estimates from difference-in-differences, intent-to-treat and instrumental variable suggest small negative effect of CCT programme on female labour participation but the effects are not statistically significant. These findings reflect similarities to those obtained by Alzua et al. (2013) for CCTs in

Table 4.8: Difference-in-Differences Estimates of CCT programme on work outcomes in 2013

	DiD	
Work	without covariates	with covariates
Post	0.161***	0.161***
	(0.017)	(0.021)
Treatment Effect	0.011	0.008
	(0.022)	(0.022)
Control Mean	0.347	0.347
No. of Obs.	14178	14174
R-Squared	0.0688	0.0976

Note:
The table is a result of cash transfer impact on a dummy for worked last week with control variables are household size, dummy for having child age <6 years, age, age squared, level of education completed, marital status dummy and household characteristics dummies. The sample is female adult between 16 and 64. Standard errors clustered at sub-district are reported in parenthesis. * p<0.1, ** p<0.05, *** p <0.01.

Mexico Honduras and Nicaragua.

4.7.2 Medium-term Effect of CCT on Female Labour Supply

Regressions Results from Panel 2007 and 2013

PKH programme medium-run impact on female labour participation evaluated using difference-in-differences specification is presented in Table 4.8. The Table shows the differences in labour supply between mothers in treated households in treatment areas with mothers in untreated households in the control areas. using difference-in-differences. Column 2 presents the DID estimate of PKH analysed using specification in equation (4.17). From columns 1 and 2, the medium-term DiD estimates are small positive between 0.8 to 1.1 percentage points but statistically insignificant.

Table 4.9: Intent-to-Treat Estimates of the impact of CCT programme in 2013

Work	ITT with covariates	ITT without covariates
Post	0.164***	0.169***
	(0.013)	(0.014)
ITT	-0.027	-0.023
	(0.018)	(0.018)
Control Mean	0.347	0.347
No. of Obs.	24526	24516
R-Squared	0.024	0.075

Note:
The table is a result of cash transfer impact with intent-to-treat using original treatment assignment on a dummy for worked last week with control variables are household size, dummy for having child age <6 years, age, age squared, level of education completed, marital status dummy and household characteristics dummies. The sample is female adult between 16 and 64. Standard errors clustered at sub-district are reported in parenthesis. * p<0.1, ** p<0.05, *** p <0.01..

PKH programme medium-run impact on female labour participation evaluated using intent-to-treat (ITT) is presented in Table 4.9. The Table shows the CCT programme impact using placement effect or intent-to-treat (ITT) which compares the outcomes between all surveyed eligible household in scheduled treatment areas L=1 (regardless whether they receive the programme or not) with eligible households who are scheduled not to receive the transfer in control areas L=0. Column 2 presents the intent-to-treat estimate of PKH analysed using equation (4.18). The medium-term estimates of the programme ITT on female work participation are negative between 2.3 and 2.7 percentage points but statistically insignificant.

PKH programme medium-run impact on female labour participation evaluated using instrumental variable techniques is presented in Table 4.10 and Table 4.11. Table 4.10 shows the first-stage IV regression using equation (4.20) with the original treatment assignment as an instrument for actual treatment in year 2013. Column 2 in the first-stage regression suggests the likelihood a household receive PKH on whether the household was assigned as treatment household in 2007 is 31.2%

Table 4.10: First-stage IV Regression with covariates using original treatment assignment as instrument for actual treatment in 2013

Outcome: Ever received PKH	without covariates	with covariates
Treatment effect	0.313***	0.312***
	(0.007)	(0.007)
No. of Obs.	12,263	12,263
R-squared	0.123	0.159
F-statistics	1731.37	209.08

Note:
The table reports first-stage regression of PKH programme status whether Ever received PKH based on original treatment assignment. The instrument is original treatment assignment. Control variables include household size, dummy for having child age <6 years, age, age squared, level of education completed, marital status dummy. The sample is female adult between 16 and 64. Standard errors clustered at sub-district level are reported in parenthesis. * p<0.1, ** p<0.05, *** p <0.01.

and significant with F-statistics of 209. Thus, the original treatment assignment, *assign*, is a valid instrument for actual treatment in 2013.

The second stage estimates of the CCT programme impact using instrumental variable technique is presented in Table 4.11. Column 2 shows IV effect of PKH using equation (4.19). From columns 1, using IV estimates without covariates the program effect is significant negative 7.4. From column 2, IV estimate with covariates, the treatment effect is significant in reduction in the probability of work by 6.9 percentage points.

4.7.3 Fertility and PKH Programme

The CCT programme impact is evaluated on fertility since the programme eligibility criteria are having children aged 1-5 or expecting baby or giving birth within the last 24 months. Fertility rate is defined as the average number of children born per childbearing age (15-49) women. Using difference-in-differences of PKH participation effect, two years after the programme was implemented, there is significant increase in overall fertility rates. The treatment effect on fertility is also significant,

Table 4.11: Instrumental Variable Estimates of CCT programme impact in 2013

Outcome: Ever received PKH	without covariates	with covariates
Treated	-0.074**	-0.069**
	(0.029)	(0.028)
Control Mean	0.3437	0.3437
No. of Obs.	12,263	12,263
R-squared	0.001	0.056

Note:
The table is a result of IV regression on receiving PKH programme impact on a dummy for worked last week with control variables are household size, dummy for having child age <6 years, age, age squared, level of education completed, marital status dummy and household characteristics dummies. The sample is female adult between 16 and 64. Standard errors clustered at sub-district are reported in parenthesis. * p<0.1, ** p<0.05, *** p <0.01.

increased by 2.2 percentage points three years after programme implementation. Similarly, six years after PKH programme implementation, there is significant increase in overall fertility rates. The treatment effect is also significant, increased by 4.8 percentage points six years after programme was implementated. These results are in line with the findings from CCT impact in the short run in Honduras, increasing fertility by 2-4 percentage points (Stecklov et al., 2006).

4.8 Discussion and Conclusion

This study analyses the impact of PKH, a conditional cash transfer programme on work outcomes for ever married mothers aged 16 to 49 using PKH RCT data at baseline 2007, wave II (2008) and wave III data (2009). In 2007, before the CCT programme was implemented, the female labour force participation rates were low of 33.3% and 35.3% for treatment and control group, respectively. This condition is due to the relatively low education of both treatment and control

Table 4.12: Empirical Estimates of CCT programme impact on fertility in 2009 and 2013

Fertility	DID in 2009	DID in 2013
Post	0.165***	0.246***
	(0.006)	(0.017)
DiD	0.022**	0.048**
	(0.009)	(0.023)
No. of Obs.	16320	16320
Controls	No	No

Note:
The table is a result of cash transfer impact on a fertility rate with control variables are household size, dummy for having child age <6 years, age, age squared, level of education completed, marital status dummy and household characteristics dummies. The sample is female adult between 16 and 64. Standard errors clustered at sub-district are reported in parenthesis. * p<0.1, ** p<0.05, *** p <0.01.

group on average with junior secondary education since the observations come from low-income households.

The results are aligned with Mincer and Polachek (1974) in Blau and Kahn (2007) on their analysis of gender differences in qualifications using human capital model. Compared to men, women tend to accumulate less labour market experience and due to child-rearing and other household duties. Married women, especially with children, anticipate more discontinuous work life. Based on static labour supply theory, the cash transfer is unearned income which might reduce labour supply through the income effect. An increase in unearned income increases demand for leisure and thus reduces labour supply or income effect (Blundell and MaCurdy, 1999).

This study shows that by employing difference-in-differences, intent-to-treat and IV techniques, the conditional cash transfer programme has small negative but

statistically insignificant effect on female work outcomes in short term (2009) or in medium term (2013). If anything, the treatment effect is significant in medium term (2013) using IV estimations, reducing work by 6.9 percentage points for IV estimate with covariates. This study findings are in line with other studies on the impact of CCT on adult labour participation by Alzua et al. (2013), Parker and Skoufias (2000), Skoufias and Di Maro (2008), Filmer and Schady, 2009; and Edmonds and Schady, 2012, and Banerjee et al. (2015). Banerjee et al. (2015) studied seven CCTs in six developing countries (Honduras, Mexico, Morocco, Phillipines, Indonesia and Nicaragua). They did not find any significant effect on labour participation or labour hours.

Further, the analysis on fertility shows that the programme had a positive significant effect by 2.2 and 4.8 percentage points in 2009 and 2013, respectively. These estimates are consistent the findings from CCT impact in the short run in Honduras which increased fertility by 2-4 percentage points (Stecklov et al., 2006). This may explain why the programme have negative impact on female labour participation. The empowerment effect might be cancelled out by the increase in fertility. The policy implication from this finding is that the programme design details are important since they can provide incentives for unintended outcomes.

The generalisability of these results is subject to certain limitations. First, it is not possible the disentangle the impact between empowerment and income effects, this is partly because the information on work participation available is only at the extensive margin, while work hours data is unavailable. Data on work intensive margin is required for further study. Second, the beneficiaries are the five percent of the lowest income population in Indonesia, thus if applied to different percentile of the socioeconomic status, one would expect different results. In terms of policy implication, it can be concluded that the government policy of poverty alleviation in the form of conditional cash transfer programme does not deter the work of the beneficiaries. If the objective is to empower the women, then

more interventions need to be considered such as providing workshops and training related to employment to encourage and accommodate the women to work.

5

Impact of Free Nine-Year Compulsory Schooling on Educational Attainment and Work Outcomes

5.1 Introduction

Economists interest in the economic value of education was not sparked until 1960s when a series of aggregate production function studies suggested that a large part of the growth of the US economy during the first half of the 20th century was attributable to improvements in human capital (Denison, 1962). It was logic to translate the implications of Denison's work on the US to the developing world where skilled manpower was in critically short supply (Colclough, 1982). In developing countries, households in total spend roughly hundreds billions of dollars on the children education, while the governments spend approximately one trillion dollars in education annually (Glewwe and Muralidharan, 2016). This spending has led to increases in enrolment at all levels with most children in developing countries complete primary school and acquire some years of schooling in secondary education, including in Indonesia. The motivation of the government spending on education is that the increases in education will enhance economic development and

growth. This belief was challenged by Romer (1990) with technology-endogenised theories which argued that cross-country differences in human capital could not quantitatively explain the differences in the levels and growth rates of output per capita. Several years later, some empirical studies challenged this belief by showing that the augmented Solow model which include human capital can explain the large share of cross-country variance in output per capita (Mankiw, Romer, and Weil, 1992; Young, 1994; Barro, Sala-i-Martin, 1995).

Indonesia as a developing country has been striving to improve its human capital by increasing the level of education of its people using several policies. One of the policies is the extension of the free compulsory schooling from six years to nine years in 1994.

The research objective of this study is to investigate the impact of the change in Indonesian compulsory education law in 1994, which extended the compulsory schooling from six to nine years. This study exploits the change in compulsory schooling law in Indonesia enacted in 1994/1995 academic year as source of identification. This study makes two main contributions. First, it provides the causal effects of the extension of compulsory schooling in Indonesia on work outcomes using a regression discontinuity design. Second, it focuses on a developing country, while most of the literature examining the impact of compulsory schooling laws were in developed countries which results may be different.

The study is important as to date there are few studies on the impact of compulsory education in developing countries. Several studies examining the impact of longer school year implemented in all education levels in Indonesia and impact of large school construction project, but none has examined the impact of Indonesia's free nine-year compulsory schooling policy on working outcomes.

This chapter addresses the question to whether the extension of free compulsory schooling from six-year primary school to nine-year junior secondary school has im-

pact on educational attainment and work outcomes later in life namely probability to be in the labour force and wages.

The remainder of the chapter is organised as follows. Section 5.2 discusses the literature review on the effects of compulsory education on educational attainment and work outcomes. Section 5.3 provides information Indonesian education system and describes the data employed. Section 4 describes the empirical specification. Section 4 presents the results and section 5 discusses the results and concludes the chapter.

5.2 Literature Review

Literature has long documented the effects of education on economic development both in applied perspectives (Colclough, 1982; Psacharopoulos, 1985; Eisemon, 1988) and theoretical perspective (Romer, 1986; Lucas, 1988; Azariadis and Drazen, 1990). Colclough conducted review on the impact of primary schooling and found that it had increased labour productivity, reduced fertility, improved health and nutrition, and encouraged behavioural changes which contributed to economic development. Psacharopoulos (1985) studied and compared returns to education in different countries based on their level of development and found that women with primary education had the highest returns to education in countries with relatively lower income per capita. Indonesia, as one of the developing countries that were studied, the private returns were 25.5 and 15.6 percent for people completed primary and secondary school, respectively. Behrman and Deolalikar (1993) studied the impact of schooling on labour market outcomes in Indonesia controlling for unobserved community and household variables. The research findings show a positive relationship between investment in education and work outcomes. Behrman and Deolalikar (1995) studied the gender differential in returns to schooling in Indonesian labour markets. The study found that the gender earning differentials

change more over the course of life due to the gender differences in hours worked over the life cycle. Substantially higher wage rates and earnings for males than females are the implied values (Behrman and Deolalikar, 1995). There were striking evidence of gender differences in the estimated association of schooling with wages and earnings. The percentage of increases in wages associated with post-primary schooling are greater for females than that of males by 50 percent (Behrman and Deolalikar, 1995).

Duflo (2001) investigated the impact of Indonesia large school construction projects between 1974 and 1978 and found that each constructed primary school per 1000 children resulted in 0.12 to 0.19 years average increase in education and between 1.5 and 2.7 percent increase in wages. Duflo (2001) found the returns to schooling in Indonesia are high between 6.8 and 10.8 percent. The same author evaluated the impact of the school construction programme on fertility and child mortality (Duflo, 2001; Duflo, 2004). Breierova and Duflo (2004) studied impact of school construction project in Indonesia and suggests that education does not significantly affect fertility. Several studies examined the impact of an unanticipated longer school year implemented in all education levels in Indonesia in 1978 on educational attainment and work outcomes. A recent study on Indonesia large school construction projects examined the long-term and intergenerational impact of the policy, and found that individuals who were exposed to the programme had more education with female's effect were concentrated in primary school. Later in life, adult males who were exposed to the programme are more likely to be in the formal employment and to migrate (Akresh, Halim and Kleemans, 2018). Females who were exposed to the programme have higher probability to migrate and have fewer children. Parental education benefits are transferred to the next generation with larger impacts for daughters from mothers. The intergenerational effects for households whose parents exposed to the policy was evidenced by the improvements in living standards and the fact that they paid more taxes. The intergenerational

effects were driven by improved marriage partner's characteristics who are more educated and have better labour market outcomes.

A study found that Indonesia's longer school year reduced the probability of grade repetition, increased educational attainment (0.7-0.9 year) and the probability of working in the formal sectors, and increased hourly wages by 13 to 17 percent or 18 percent per additional year (Parinduri, 2014). Carneiro et al. (2017) studied the returns to senior secondary schooling in Indonesia using instrumental variable technique to evaluate the average treatment effect (ATE), average treatment on treated (ATT) and average marginal treatment effect (AMTE), with distance to school as the instrument. The findings are larger than those of Duflo (2001), the estimate of return to senior secondary school for a random person (ATE) was 13.8%, the return estimate for individuals who were enrolled in senior secondary school was 21.8% and to the marginal students who were more likely to be attracted by the expansion of senior secondary school (AMTE) was 14%. Pisckhe (2007) studied the effect of short school years in Germany between 1966 and 1967 and found that reduction in instructional time of 26 weeks over the two years period increased grade repetition and decreased higher secondary schooling attendance, but it did not have significant impact on employment or earnings later in life.

In contrast to the limited number of studies on the long-term effects of school term reduction and extensions, there is large literature exploiting changes in compulsory schooling laws which regulate the minimum years of schooling an individual must acquire. Card (1999) showed a review of studies that used compulsory schooling laws, differences in school accessibility and similar features as instrumental variables for completed education, the return estimates are often larger than OLS estimates. The upward-bias of the IV estimates were attributed to the fact that marginal returns to education among the low-education subgroups affected by the supply side innovations tend to be relatively high (Card, 2001). Belzil, Hansen and Liu (2017) argue that the IV estimates on compulsory schooling laws

are uninformative for the average effects of education because they overestimate the true effect due to heterogeneity of compliers tend to be significantly lower than IV estimates.

More recent studies the causal effects of extension of the compulsory education on health outcomes, suggest smaller and often negligible impacts (Meghir, Palme and Simeonova, 2012; Fabbri and Fort, 2013; Gathmann, Jurges and Reinhold, 2015; Brunello, Braakmann, 2011; Clark and Royer, 2013). Temporary and permanent increase in schooling may have different effects on income but temporary and permanent increase in schooling can affect learning and the ability to process information (Glewwe, 1999; Lleras-Muney, 2002).

Other outcomes of compulsory education considered in the literature are cognitive abilities (Schneeweis, Skirbekk and Winter-Ebmer, 2014; Crespo, L'opez-Noval and Mira, 2014), fertility (Cygan-Rehm and Maeder, 2013; Fort, Schneeweis and Winter-Ebmer, 2016), intergenerational transmission (Oreopoulos, Page and Stevens, 2006; Piopiunik, 2014; Lundborg, Nilsson and Rooth, 2014; Gunes, 2015), and crime (Hjalmarsson, Holmlund and Lindquist, 2014). Lleras-Muney (2005) investigated the effect of education on adult mortality and find that an additional year of compulsory schooling decreased mortality after age of 35 by three percent. Oreopoulos (2006) examined the effect of school-leaving age laws on educational attainment and earnings and compared the returns to compulsory schooling for the United Kingdom, the United States and Canada using OLS, IV-Difference-in-Differences and IV-Regression Discontinuity. The law changes in the minimum school leaving age had a remarkable impact on education attainment, the fraction of British who left full-time education before at 14 dropped dramatically from 60% to 10% before and after the law changed in 1947. The findings also suggest that the compulsory schooling has large effect on earnings between 10 and 15 percent on both the majority and minority groups who were exposed to the policy.

Other recent studies on European countries suggest the changes in the number of compulsory years of schooling have small effects on economic returns (Devereux and Hart, 2010; Chib and Jacobi, 2015). Grenet (2013) compared similar compulsory schooling reforms of extending school leaving age between England and Wales and France and found only the former saw an increase wages. Grenet (2013) found that the main difference was attributed to the sharp decline in the fraction of individuals without qualifications in England and Wales and concluded that sheepskin effects could explain the earnings difference. Pischke and von Wachter (2008) examined effect of compulsory schooling laws in West Germany after WWII and found a negligible impact on earnings.

A recent study on the very view studies of compulsory schooling in developing countries, Xiao, Li, and Zhao (2017) evaluated the long-run effects of free compulsory schooling in rural China on educational attainment, cognitive and health outcomes. The study found that compulsory education combined with school fees removal had positive impact on educational attainment and cognitive achievement measured by early adulthood math test scores.

5.3 Indonesian Education System and Data

Indonesian education system and policies since 1970s

The national education system in Indonesia comprises pre-tertiary education and tertiary education. Pre-tertiary education consists of early childhood with two years in kindergarten followed by six years in primary school, and three years each in junior and senior secondary school. Tertiary education comprises two-year, three-year diploma's or four-year bachelor's degree as depicted in Figure 5.1. Both public and private schools run Indonesian primary, secondary and tertiary education in Indonesia (OECD, 2015).

Indonesian education system consists of formal education, non-formal education, and informal education. Formal education comprises early childhood education,

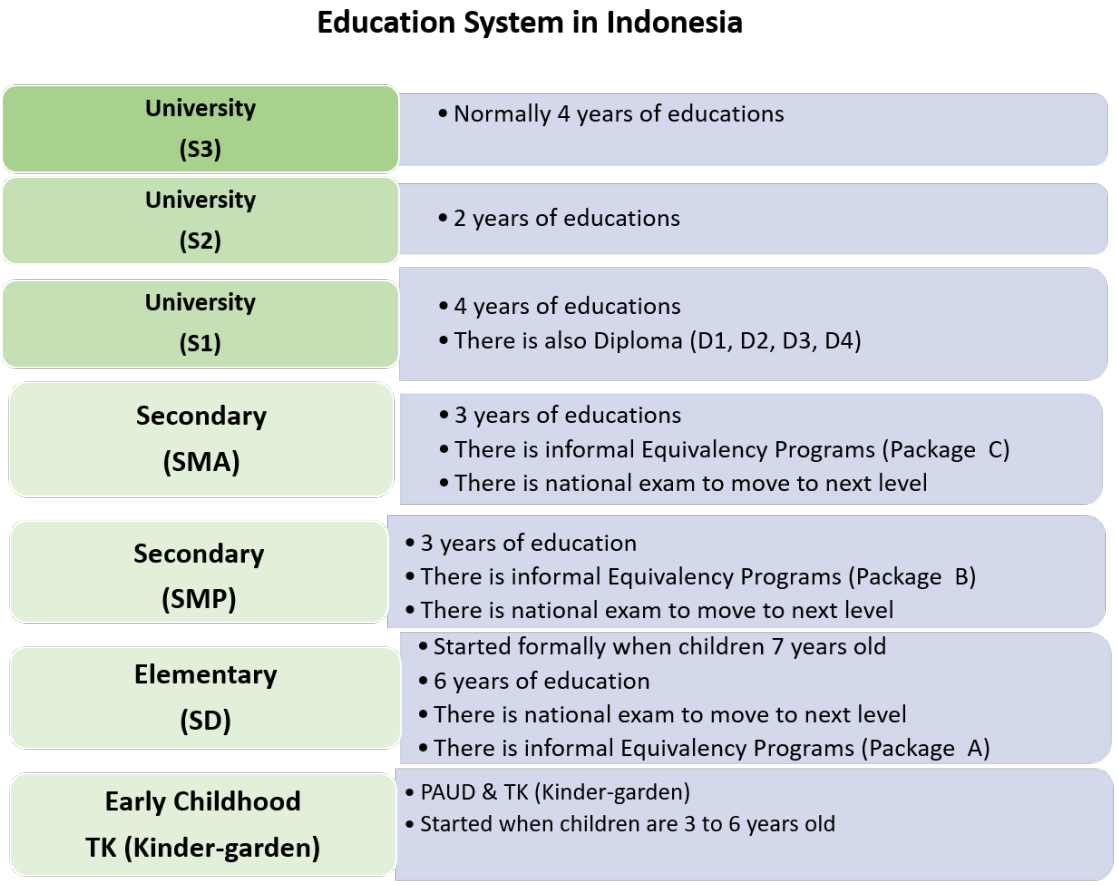

Figure 5.1: Indonesia National Education System

basic education which consists of primary and junior secondary schools, hereafter compulsory education, senior secondary education, and tertiary education. Home-schooling is considered as informal education.

(i) The early childhood education options are one-year or two-years of kinder-garten in the formal education where children can start at the age of 5 or younger. Children's playgroup is the form of non-formal education which can be managed by training or community institutions.

(ii) Basic education is the compulsory part of Indonesian education system. It consists of six years of primary school and three years of junior secondary school. Before 1994, the basic or compulsory education was six years in primary school. Children can start primary school at the age of seven. Pupils

must pass the primary school national examination in order to enter junior secondary school. For the non-formal education, children who reach the age of 13 can sit in the package A primary school equivalent test and receive primary school certificate upon passing the test. Children who already reach the age of 16 can sit in the package B junior secondary school equivalent test and receive junior secondary school certificate upon passing the test. The government work with the local communities to provide tutorials for the equivalent programmes.

(iii) Senior secondary education is three years of schooling following basic education. The three years secondary education is provided in public and private schools for formal education. The senior secondary education also provides opportunity to study in vocational schools where they can learn technical skills such as mechanical, electronics to become technicians, nursery to become nurse assistants, or in tourism. For the non-formal education, children who already reach the age of 19 can sit in the package C senior secondary school equivalent test and receive high secondary school certificate upon passing the test.

(iv) Tertiary or higher education comprises university and vocational college education. University offers a four-year bachelor's programme, two-year Master's degree programmes require two years to complete and doctoral programmes require three to four years to complete the degree. In vocational college, people can study from one-year up to four-year to obtain a vocational diploma. Senior secondary school students must pass the national exam and national public university exam for admission in public universities. Private universities organise their own student selection tests.

Primary school enrolment had quadrupled since Indonesia's independence in 1945 until 1960. Despite the significant growth, the enrolment rate declined in early

1970s (World Bank, 1989). The Indonesian Government financed a large primary school construction programme in 1974 using an increase in oil revenues. It built 61 thousand primary schools or 145 thousand school buildings in underserved areas (Duflo, 2001), it also supplied textbooks and hired new teachers. The programme was successful in increasing enrolment by 13 million in 1986 or increased primary net enrolment rate to 91.3 percent (World Bank, 1989).

The Indonesian Government implemented a large school construction project between 1974 and 1978. The project built 60 thousand primary schools across Indonesian provinces.

Prior to 1979, academic and calendar years coincided. In 1979, the government shifted the beginning of school year from January to July. This unanticipated policy delayed grade progression for all individuals who were in school in 1978 (Parinduri, 2014). In 1984, the Indonesian Government announced the six-year compulsory education.

In 1989, the secondary school enrollment rates for males and females were 43 and 51 percent, respectively (Behrman and Deolalikar, 1995). The Indonesian Government announced the enactment of nine-year compulsory education law to take effect in July 1994. The law is Presidential instruction (*INPRES*) on compulsory schooling Number 1, dated on 15 April 1994 on the compulsory education extension.

In 2004, the Indonesian Government amended its constitution and stipulated that 20 percent of the state budget must be dedicated to education expenditure excluding teachers' salaries. Subsequently, the junior and senior secondary enrollment had risen considerably and was attributed to the above policy (World Bank, 2013). Twelve-year compulsory education or up to senior secondary school was finally introduced by the Indonesian Government in 2015.

5.4 Data and Summary Statistics

This study employs the Indonesia Family Life Survey (IFLS), an on-going longitudinal household survey conducted by the RAND Corporation.[1] IFLS is an integrated socio-economic longitudinal survey comprising a wide-range information on the lives of the respondents, households and their communities. The first wave, IFLS is a representative sample of about 83 percent of the Indonesian population, including over thirty thousand individuals living in 13 of the country's 27 provinces in 1993. IFLS2 followed up with the same sample four years later, in 1997-1998. One year after IFLS2, a 25% subsample was surveyed to provide information about the impact of Indonesia's economic crisis. IFLS3 was fielded in 2000, IFLS4 in 2007-2008 and IFLS5 in 2014-2015.

This study uses the latest wave survey, IFLS-5 which was conducted in 2014-2015 (`https://www.rand.org`). In IFLS5 the recontact rate was 92%. For the individual target households (including split-off households as separate) the re-contact rate was 90.5%. These re-contact rates are as high as or higher than most longitudinal surveys in the United States and Europe. High re-contact rates were obtained because their commitment in tracking and interviewing individuals who had moved or split off from the origin IFLS1 households. High re-interview rates contribute significantly to data quality in a longitudinal survey because they reduce the risk of bias due to nonrandom attrition in studies using the data.

The observation is restricted to year of birth between 1972 and 1984 which includes individuals born 6 years before and 6 years after the cut-off point. There are 10,836 used observations in most specifications. The assumption is all individuals in the 1979 cohorts entered junior high school in 1994 or later. This is a reasonable assumption as most children in Indonesia enter primary school at the age seven and

[1]The data is available from `http://www.rand.org/labor/FLS/IFLS.html`.

Table 5.1: Summary statistics for nine-year compulsory schooling

	Older Cohorts(Controls)		Younger Cohorts(Treatments)	
Variable	Mean	Std Dev	Mean.	Std. Dev.
Javanese	0.384	0.486	0.382	0.486
Years of education	8.327	4.512	9.017	4.522
Completed at least 9 yrs of educ.	0.541	0.498	0.640	0.480
Worked for pay	0.730	0.444	0.713	0.452
Worked in formal sectors	0.575	0.494	0.582	0.493
Monthly wages (in Rp 1,000)	1995.000	2674.000	1971.000	2698.000
Birth district	0.371	0.483	0.373	0.484
Birth province	0.190	0.392	0.189	0.392
Age-School entry	6.672	0.689	6.571	0.685
Went to kindergarten	0.211	0.408	0.283	0.451
Age-kinderg. entry	5.026	0.685	4.914	0.711
Type of birthplace	0.236	0.425	0.257	0.437

Note:
The sample is taken from 10,836 observations who were born 6 years before and after the birth quarter cut-off point

thus would enter junior secondary school at the age of thirteen. Completing nine-year of education i.e. junior secondary school is used as the educational attainment outcome, and examine the work outcomes whether the individual worked for pay, whether the individual worked in formal sectors, and the log of average monthly wages. Month of birth is selected as the running variable.

Table 5.1 shows the descriptive statistics, including the covariates, gender, the ethnicity (Javanese), whether current district is the same as birth district, whether current province is the same as birth province and if the birthplace was a town. The older cohorts, who were not exposed to the compulsory schooling law, had lower educational attainment with respect to years of education (8.32) compared to younger cohorts (9). In terms of completing junior secondary school, the proportion of older cohorts and younger cohorts are 54% and 64%, respectively. In general, the older cohorts had higher probability to work for pay than the younger cohorts, while the probability of working in formal sectors and the earnings of older and younger cohorts were quite similar.

5.5 Empirical Strategy

This study exploits the variation in educational attainment with respect to the change in compulsory schooling law in Indonesia took effect in July 1994 academic year to investigate the causal relationship between education and work outcomes. Examining the causal impact of education on work outcomes is a complicated task. There is endogeneity of unobservables associated with education which might also affect work preferences. To overcome this issue, the policy of extended compulsory education will be exploited as a source of exogenous variation in a regression discontinuity design.

The change in compulsory schooling law was an unanticipated policy so parents would not be able to strategically plan their children's birth to adjust with the policy. The evidence for this will be discussed in the falsification checks.

Regression discontinuity (RD) identification is based on the idea that in a highly rule-based world, some rules are arbitrary and thus provide good opportunity for experiment (Angrist and Pischke, 2008). In the literature, RD design generally comes in two types, sharp and fuzzy (Hahn et al., 2001). A sharp design is used when the treatment is defined deterministically on some observable variable (Angrist and Pischke, 2008). A fuzzy design exploits the discontinuity in the probability of receiving treatment conditional on a covariate (Angrist and Pischke, 2008). A fuzzy design differs from a sharp design in that the treatment assignment is not a deterministic function of the observable variable.

The compulsory schooling affects educational attainment, which was induced by the timing of birth as an instrument. Following Imbens and Lemieux (2008), the probability of receiving treatment of nine-year compulsory education is a function of continuous running variable, the timing of birth,

A fuzzy regression discontinuity design is employed because the treatment to completing at least nine years of schooling is not deterministically assigned. Com-

pleting nine years education is not deterministic because the compulsory schooling policy in Indonesia implies that the government is responsible to provide free basic education for the people, while the pupils and parents may decide not to abide with the rules without apparent consequences. Moreover, some of the younger cohorts may have dropped out of school before 1994, while some of older cohorts may be exposed to the policy if they entered primary school at the age of seven or older. Hence, there is a discontinuity in the probability of being treated. The extension of compulsory schooling rule was also weakly enforced since there is no minimum attendance requirements, thus pupils and parents may not abide with the policy.

As the minimum age of primary school participation was seven years old, 30 September 1978 is chosen as the cut-off point as the oldest cohort who were unaffected by the policy, as depicted in figure 5.2. The assumption is most Indonesians who were born in September 1978 or earlier were not directly exposed to the policy enactment, with some of the older cohorts born in 1978 were exposed to the policy because they entered primary school at the age of seven. A fuzzy regression discontinuity design exploits the discontinuities in the probability of treatment conditional on the running variable (Angrist and Pischke, 2008). The discontinuity at the threshold becomes an instrumental variable for the treatment status, thus a fuzzy RD design is essentially an IV.

$$P_i(D_i = 1|x_i) = \begin{cases} g_1(x_i) & \text{if } x_i \geq x_0 \\ g_0(x_i) & \text{if } x_i < x_0 \end{cases} \text{,where } g_1(x_0) \neq g_0(x_0) \tag{5.1}$$

Where x_0 is a known cut-off point or threshold

The following fuzzy regression discontinuity specification will be estimated:

$$Y_i = \beta_0 + \beta_1 D_i + \beta_2 d_i + \delta(D_i * d_i) + \gamma X_{it} + \epsilon_{1i} \tag{5.2}$$

Where: Y_i is the outcome of interest, D_i is an indicator variable that takes the value of 1 if the individual completed at least nine-year of education and 0 otherwise, and d_i is the running variables which captures the distance from September 1978 in months. X_{it} is a set of individual-level covariates: ethnivity dummy (1=Javanese), birth district (1=current district), birth province (1=current province), type of birthplace=town, dummy for went to kindergarten, and gender. The work outcomes later in life are evaluated as the results of completing nine years of schooling include whether the individual worked for pay, whether the individual worked in the formal sector, and the individual's log of average monthly salary.

Outcomes of interest chosen is whether individuals worked for pay obtained from survey question of *During the past week, did you do any of these activities?*. The response options are (1) Yes (3) No. Individual answering yes will be marked as worked for pay. The response rate is high of 94.4%.

The second outcome is whether individuals worked in the of formal sectors is obtained from survey question of *What is the sector of the company you are working?*. The response options are (1) Agriculture, forestry, fishing and hunting; (2) Mining and quarrying; (3) Manufacturing; (4) Manufacturing; (5) Construction; (6) Wholesale, retail, restaurants and hotels; (7) Transportation, storage and communications ; (8) Finance, insurance, real estate and business services; (9) Social services; (10) Activities that cannot be classified. Response rate for the question is 77.2%. The sectors that considered formal sectors if the response is betwen (3) and (8). The total number of individual classified as work in the formal sectors was 5,982 or 55% of the overall sample.

The other outcome is the average monthly wages, obtained from survey question of *Approximately, What was your monthly salary/wage during last month (including the value of all benefits)?*. The response rate is 44.5% or 4,553 responded, 1.6% or 166 responded zero, leaving 4,387 non-zero responses.

The corresponding first-stage regression is:

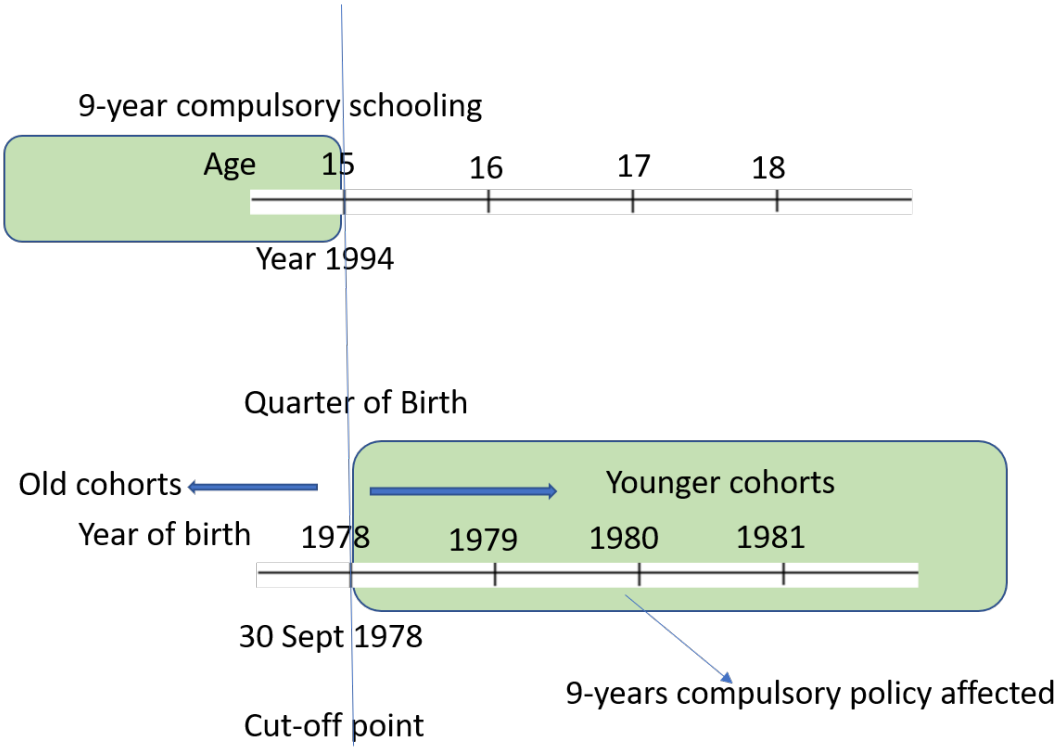

Figure 5.2: Age and Birth date Cut-off

$$D_i = \alpha_0 + \alpha_1 T_i + \alpha_2 d_i + \alpha_3 d_i T_i + \alpha_l X_{it} + \epsilon_{21} \tag{5.3}$$

The birth date cut-off used 30 September 1978. Since D_i, whether individual had completed at least nine years of schooling is endogenous, it is instrumented with time of birth dummy $T_i = 1$ if the individual was born after September 1978 in equation (5.3). They are the cohorts who were exposed to the nine-year compulsory schooling policy. While the older cohorts were born on 30th September 1978 or earlier who were not exposed to the policy. The running variable used is month of birth.

The average causal effect of nine-year compulsory schooling, β_1 or the coefficient of interest, at the cut-off x_0 is given by:

$$\beta_1 = \frac{E[Y_i|x_0 < x_i < x_0 + d_i] - E[Y_i|x_0 - d_i < x_i < x_0]}{E[D_i|x_0 < x_i < x_0 + d_i] - E[D_i|x_0 - d_i < x_i < x_0]} \tag{5.4}$$

β_1 is the local average treatment effect (LATE), the coefficient of interest (Lee and Lemieux, 2010). Equation (5.2) will be estimated using local polynomial regressions of order one and two.

Equation (5.2) is estimated around narrow bandwidths below and above the cut-off. Bandwidths are selected based on data-driven procedures approach following Calonico, Cattaneo and Titiunik (2017).

The allocation of individual across treatment and control groups is as good as random around at the cutoff point. The implication allows us to use of outcomes just below the cut-off as valid counterfactual for those just above the cut-off (Lee and Lemieux, 2010). Bandwidths selected in this analysis are varied between 22 and 48 months.

Recent studies defend the use lower order polynomials in regression discontinuity of observed outcomes on the running variables (Skovron and Titiunik, 2015; Gelman and Imbens, 2017). The use high-order polynomials in regression discontinuity is flawed which leads to noisy estimates and sensitivity (Gelman and Imbens, 2017). Local linear and quadratic regressions will be used in the analysis. The model is estimated using triangular weights for the running variables as the Statistics literature (Fan and Gijbels, 1996) shows that triangular kernel is optimal for local linear regression estimations at the boundary. Triangular kernel puts more weight on observations closer to the threshold (Fan and Gijbels, 1996).

Falsification checks are then performed where individuals near the cut-off month of birth differ on several covariates. The placebo test is aimed at testing the validity of the estimation design. The variables such as ethnicity and place of birth should not be influenced by the policy. The placebo regressions are performed on control variables as the outcome variables using the following reduced-form equation (5.5):

$$Y_{it} = \beta_0 + \beta_1 T_i + \beta_2 d_i + \delta(d_i T_i) + \gamma X_{it} + \epsilon_i \tag{5.5}$$

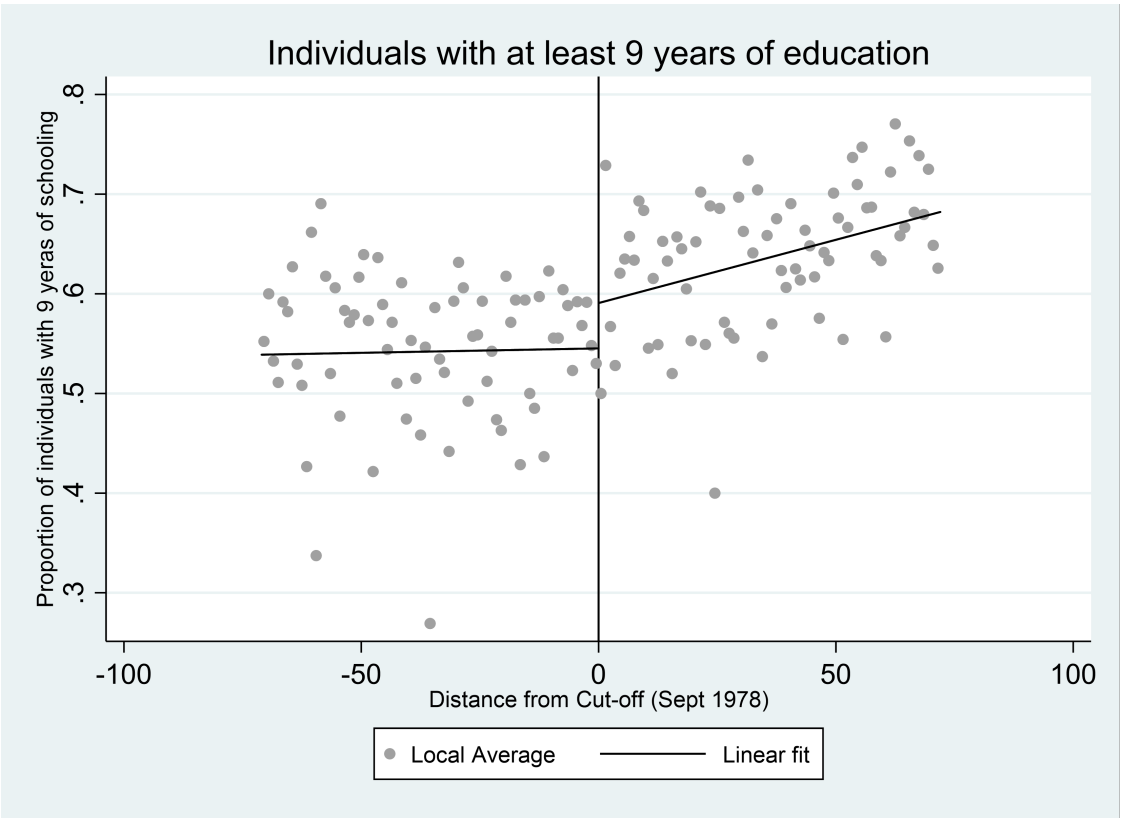

Figure 5.3: Educational Attainment by Month of Birth

5.6 Regression Discontinuity Plots

The RD plots for work outcomes are presented in Figure 5.4, Figure 5.5 and Figure 5.7. Local polynomial regression discontinuity is employed. The local polynomial regression can capture the discontinuity around the cut-off. The local linear and quadratic regression are employed using "rdrobust" Stata command developed by Calonico, Cattaneo, Farrel and Titiunik (2017).

5.7 Results and Discussion

The results of the placebo regression are shown in Table 5.2. The table shows that the timing of birth after September 1978 does not have discontinuities on the ethnicity (1=Javanese) or the birthplace (1=town).

Month of birth is selected as the running variable in the basic specifications.

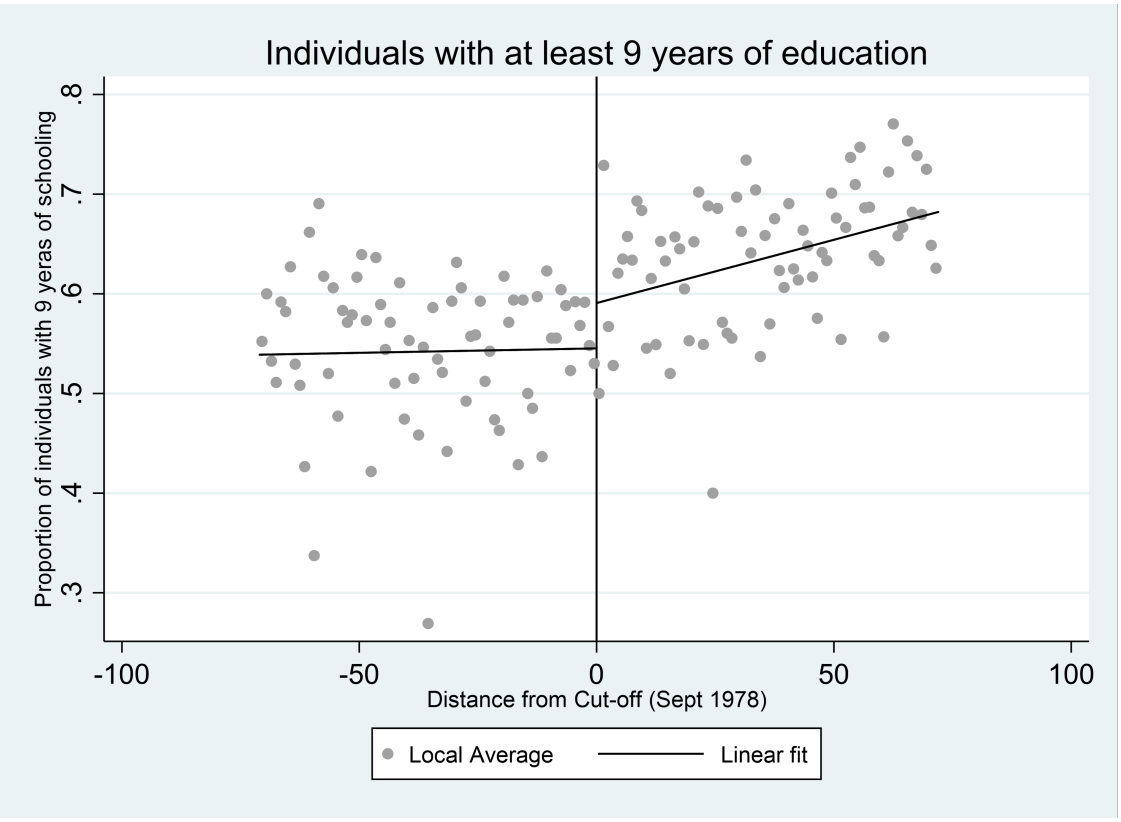

Figure 5.4: Educational Attainment by Month of Birth

Table 5.2: Placebo Estimations

Treatment Dummy	Javanese	Place of birth town
Born after Sept 1978 (T=1)	0.030	0.010
	(0.019)	(0.036)
Observations	10836	10836
Control	Yes	Yes

Note:
Standard errors are clustered at the discrete value of the running variables

Parametric estimations with IV 2SLS will used in the main analysis and non-parametric estimations using local linear regression will used as the robustness check.

5.7.1 First Stage Results

The impact of the of nine-year compulsory education policy on educational attainment is evaluated by observing the RD plot first-stage outcome of individuals

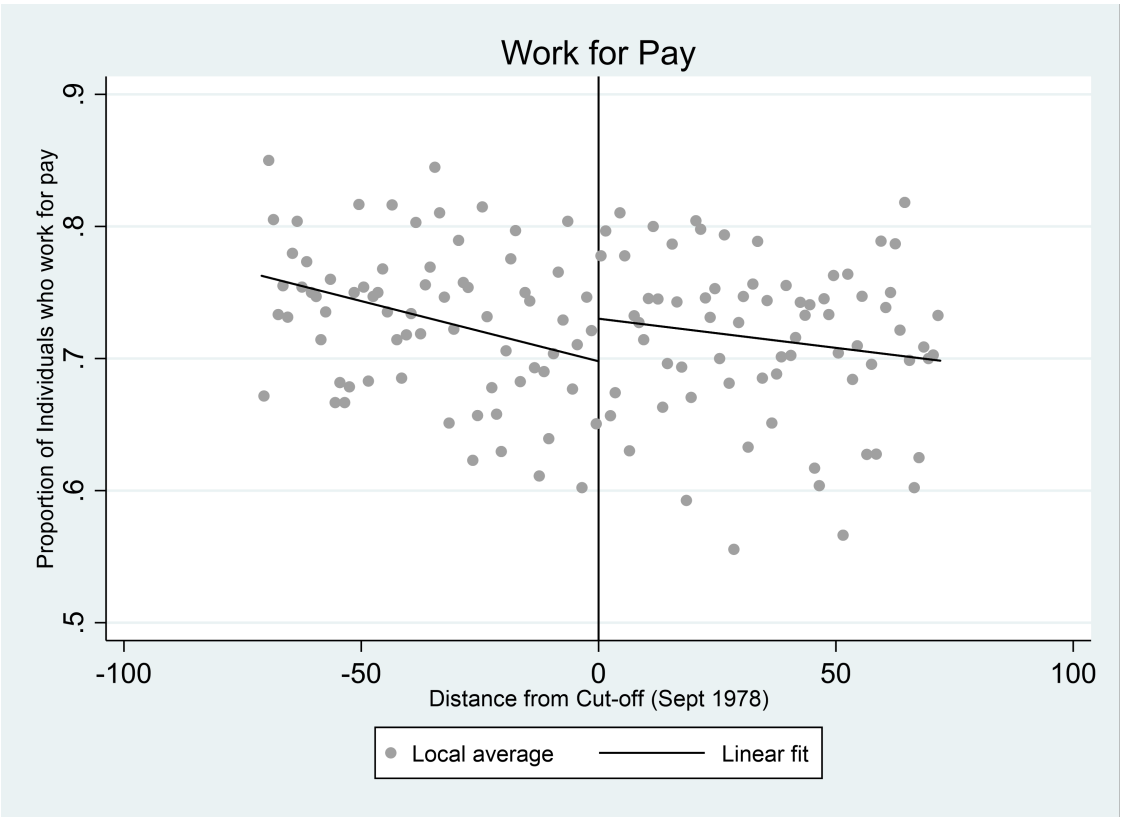

Figure 5.5: Work for Pay by Month of Birth

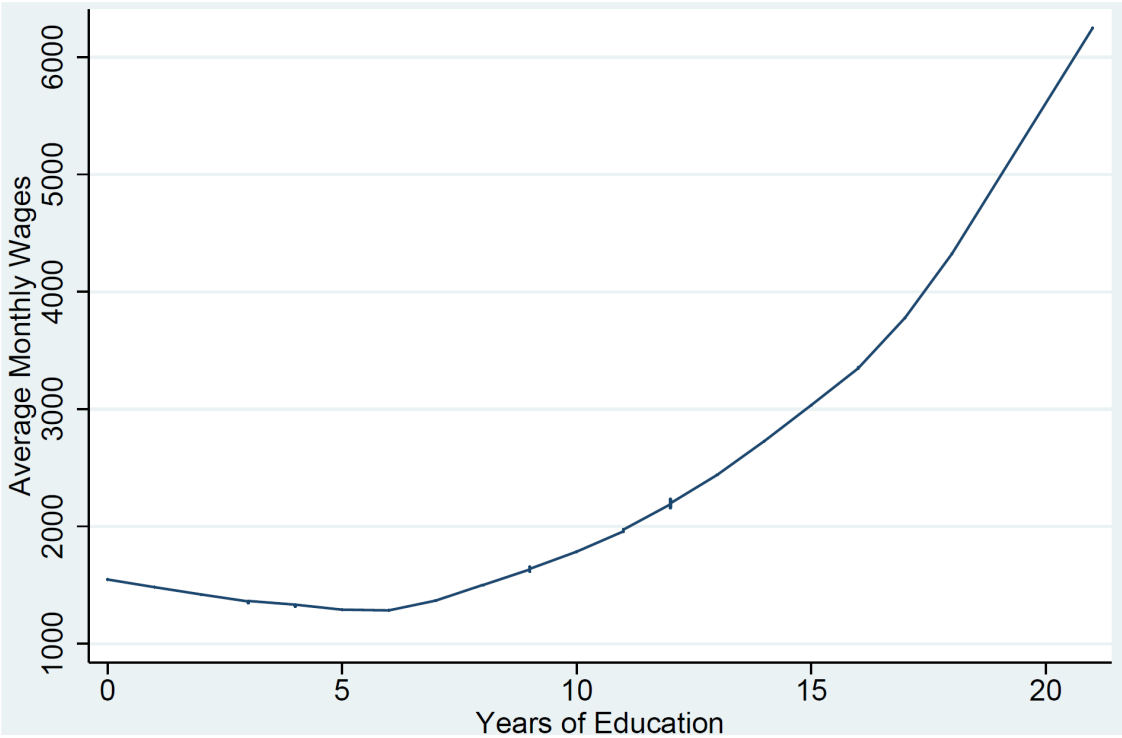

Figure 5.6: Plot of average monthly wages by years of education

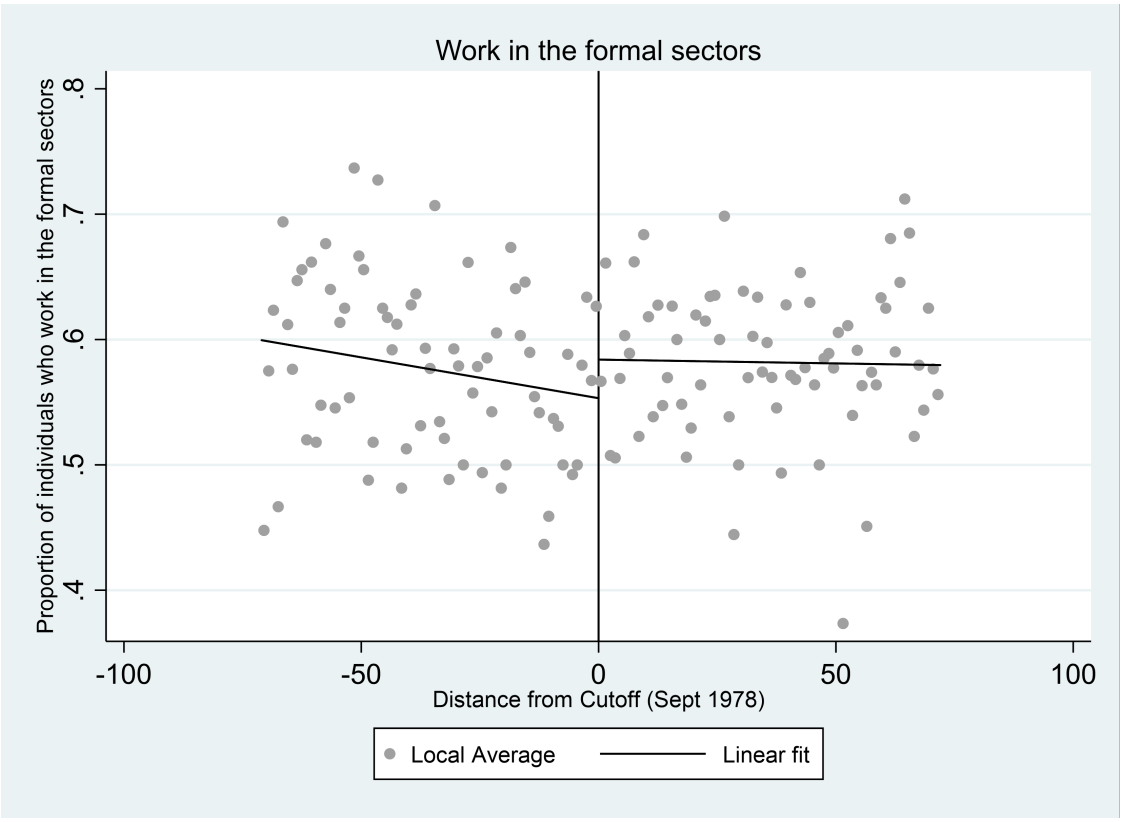

Figure 5.7: Proportion of Individuals who Worked in the Formal Sectors by Month of Birth

who completed at least nine years education or junior secondary school. Plots are drawn using triangular kernel with local linear and local quadratic regressions. The dots in the plots are the local average value within each bin, bin range is evenly spaced chosen by-data driven methods mimicking the underlying regression function (Calonico, Cattaneo and Titiunik, 2014). Figure 5.3 shows the proportion of individuals who completed nine years education in relation to individual's month of birth. The local averages are plotted for individuals who were born between 1972 and 1984 using IFLS wave 5. The figure shows that while the proportion of individuals who completed junior secondary school increases gradually, there is a discontinuity in the proportion after the cut-off point when the first cohort exposed to the nine-year compulsory schooling law enactment in 1994. The figure depicts the proportion of individuals completed junior high school saw an increase

by 5% from 54% to 59%.

The polynomial regressions of order 2 also shows discontinuity in the proportion of individuals who completed junior secondary education using month of birth as the running variable with evenly spaced bins.

Table 5.3 presents the first stage regression outcome of completed nine years of schooling from three different 2SLS specifications: working for pay, working in formal sectors and log of monthly wages. The first-stage estimates confirm the discontinuity depicted in the previous figures. The first-stage outcome of completed nine years of education is instrumented with whether the individual was born in the month after the cut-off point, September 1978. All estimates are significant at 1% level and the estimates confirms the RD plot, about five percent. In other words, the instrument of whether the pupils were born just after the cut-off increased the likelihood to complete at least nine years of education by 5.4 percent compared to those who were born just before the cut-off.

5.7.2 Second Stage Results

Table 5.4 presents the second stage estimates of 2SLS regressions for three work outcomes, work for pay, work in formal sectors and log monthly wages. The estimates for work for pay and work in the formal sectors due to completing nine-year education are 30.6 and 48 percentage points, respectively. The estimate for log of average monthly wages due to completing additional three years of schooling is 30 percentage point or 10 percentage points per year. Although not statistically significant, the estimate is comparable to that of Duflo (2001) who estimated between 1.5% and 2.7% increase in wages per 0.12 to 0.2 additional years in primary school or 12 to 13 percent increase in wages per additional school year. The estimate also reflects similarities to those obtained by Oreopolous (2006) who found the effect of minimum school leaving age change in the UK on wages increase were between 10 and 15 percent.

Table 5.3: First-stage estimates of 2SLS regressions: Completed Nine Years Education

	Work	Work in	Log Monthly
Treatment	for Pay	Formal Sectors	Wages
Born after	0.054***	0.054***	0.081***
September 1978 (T=1)	(0.019)	(0.018)	(0.028)
No. of Obs.	10,836	10,836	4,387
Adjusted R2	0.010	0.010	0.015
F-statistic	31.07	31.07	17.65
Controls	Yes	Yes	Yes

Note:
First-stage estimates are obtained from 2SLS regressions. Control variables are ethnicity dummy (Javanese), birth district=current district, birth province=current province, age of school entry, and gender. Standard errors are clusters at the discrete value of running variable (distance from month of birth cut-off). *p<0.1, ** p<0.05, *** p <0.01.

Table 5.4: Second stage estimates of 2SLS regressions: Completed Nine Years Education

	Work	Work in	Log Monthly
Treatment	for Pay	Formal Sectors	Wages
Nine-year education	0.306	0.485	0.300
	(0.298)	(0.355)	(0.664)
No. of obs.	10,836	10,836	4,387

Note:
Estimates are obtained from 2SLS regression. Control variables are ethnicity dummy (Javanese), birth district=current district, birth province=current province, age of school entry, and gender. Standard errors in parenthesis are clusters at the discrete value of running variable (distance from month of birth cut-off). *p<0.1, ** p<0.05, *** p <0.01.

5.7.3 Robustness checks

Table 5.5 presents the RD estimates for work outcomes, using local linear regressions using “rdrobust” Stata command with distance from month of birth cutoff as the running variable. Using 'rdbwselect" Stata command, th optimal order is at degree 1, so only local polynomial regression is used. The probability to work for pay range between 4.5% to 5.5% of increase, with the bandwidths 24 and 48

Table 5.5: Nine years Compulsory Schooling on Working Outcomes - Linear

Bandwith	Working for Pay	Working in Formal Sector	Log Monthly Wages
BW= 22 months	0.055	-0.001**	0.012
	(0.036)	(0.033)	(0.088)
RD robust p-value	0.126	0.023	0.914
No. of Obs.	3264	3264	739
BW=24 months	0.050*	0.004*	0.003
	(0.035)	(0.032)	(0.086)
RD robust p-value	0.099	0.061	0.589
No. of Obs.	3576	3576	1420
BW=36 months	0.045	0.017	0.038
	(0.029)	(0.028)	(0.071)
RD robust p-value	0.191	0.672	0.978
No. of Obs.	5304	5304	2141
BW=48 months	0.047*	0.026	0.036
	(0.024)	(0.052)	(0.063)
RD robust p-value	0.051	0.987	0.763
No. of Obs.	7256	7256	4387
Controls	Yes	Yes	Yes

Note:
BW is bandwidth in months. Control variables are ethnicity dummy (Javanese), birth district=current district, birth province=current province, age of school entry, and gender. Standard errors are clusters at the discrete value of running variable, distance from month of birth cut-off. * p<0.1, ** p<0.05, *** p <0.01.

months are significant at 10 percent level. Working in the formal sectors estimates range between -0.1% to 2.6% of increase as effect of the compulsory schooling policy although only the ones with bandwidths of 22 and 24 months are statistically significant. All log monthly wages estimates suggest positive effect ranging between 1.2 and 3.6 percentage points although none are statistically significant.

5.8 Discussion and Conclusion

This chapter investigates the effect of Indonesia's free nine years of compulsory education law enacted in 1994 in all Indonesian provinces with fuzzy regression discontinuity design using the fifth wave of Indonesia Family Life Survey (IFLS) data 2014/2015. This study exploits the policy of extending compulsory education from six years to nine years in 1994/1995 academic year as an exogenous variation to identify the effect the compulsory schooling policy on educational and work outcomes. Month birth is used as the running variable in the main analysis. The cut-off point is the date of birth of 30th September 1978. It was the last cohort not exposed to the policy.

The compulsory schooling policy increases the proportion of cohorts who completed at least nine years of schooling. The results show that the proportion of individuals who completed at least nine years of schooling were 55% and 60% before and after the cut-off or went up by 5% for the cohorts who were first exposed to the compulsory schooling law. These results are not as large as in developed countries such as US or UK which had 50% drop in the fraction of people left school by the changes in the minimum school leaving age law. This is mainly due to the weak enforcement and limited resources of the government. Additionally, pupils may not be able to easily access secondary schools as the locations are comparativaly more distant which could discourage children to go to school.

The second stage results from IV estimation present the effect the compulsory schooing law on three work outcomes. The estimates for work for pay and work in the formal sectors due to completing nine-year education are 30 and 48 percentage points, respectively. The estimate for log of average monthly wages was 10 percentage points per year. Although not statistically significant, the estimate is comparable to that of Duflo (2001) who estimated between 12 and 13 percent increase in wages per additional primary school year. The estimate also similar to

those obtained by Oreopolous (2006) for the effect of minimum school leaving age change in the UK on earnings, between 10 and 14 percent.

The results from local linear regressions suggest that the estimates are stable for different bandwidths. The local linear estimates of compulsory schooling on working for pay are positive ranging between 4.5 and 5.5 percentage points. The estimates are significant under 24 and 48 months bandwidths. The local linear estimates of compulsory schooling on working in the formal sectors is range between -0.1 and 2.6 percentage points and significant under 22-month and 24-month bandwidths. The results for log of monthly wages are posotive between 0.3 and 3.8 percentage points but none are significant. This study concludes that the nine-year compulsory schooling policy affects educational attainment in completing at least nine years of schooling. The effect of compulsory schooling on working outcomes later in life using local quadratic regression is significant in increasing the probability of working for pay by 3.6%. No significant effect is found on other outcomes such as the likelihood on working in the formal sectors, nor on wages.

The limitation of this study is that the compulsory schooling law is not the same as those in developed countries. First, the degree of the enforcement is not as strong due to the government's limited resources. Second, parents have more rights in deciding whether their children should go to school or not without apparent consequences. Third, during the time the policy was initiated, education may not be the priority for people in developing countries, particularly for the low-income population.

6

Impact of National Programme of Community Empowerment (PNPM) Generasi on Community Participation and Health Outcomes

6.1 Introduction

The concept of people as an important part of nation's wealth has long been understood by economists, the differences between developed and less developed countries can be explained by the investment in human capital (Schultz, 1961). One of the solutions for a country to break the poverty chain is by improving the quality of its human capital, which can be achieved by improving the education and health outcomes of the people. Despite the fall in maternal mortality rate (MMR) in low medium-income countries, Indonesia's MMR remained high at 230 maternal deaths per 100,000 live births between in 2014. The implementation of Generasi, the National programme of Community Empowerment was partly aimed to address the high maternal mortality rate. The programme was aimed at improving health and education outcomes of the beneficiaries who live in rural areas where healthcare and education facilities require improvement.

In 2007, the Indonesian Government launched the National programme of Community Empowerment, PNPM Generasi as a community cash transfer programme. The programme was intended to improve the quality of human capital through investment in health and education in rural areas at village level. Generasi health fund was to be allocated to health facilities in the form of monetary incentives for health service facilities, namely village midwife clinics, subdistrict health centres henceforth, Puskesmas, and monthly community health service, Posyandu. There is also direct assistance for households in the form of transportation allowance for expectant mothers, and subsidies for childbirth cost. This effort is aimed to address the financial constraint in accessing healthcare services. The programme is the only village-level community programme when the programme initiated in 2007, if the villages previously received different programme then the Generasi programme replaced it. All villages receive funds allocated from the central government and provincial government, however there was no change before and after the programme so there were no potential confounding policies.

The research objective of this chapter is to investigate the effects of National programme of Community Empowerment, Generasi health block grant, on community participation in village decision making, the quality of health facilities, health care provision; health facilities utilisation and health outcomes of mothers and children. This study makes several contributions. First, providing the impact of national programme of community empowerment on community participation and health facilities using village potential (Podes) data in addition to PNPM Generasi Data. Second, this chapter attempts to analyse the village governments with respect to how the villages manage the health block grant.

In developing countries, 30 percent of expectant women do not receive antenatal care which can lead to iron deficiency, pregnancy complication and lower birth weight (Abou-Zahr et al., 2003). Child mortality in developing countries is three times that of developed countries which caused by diarrhea, pneumonia, malaria

and undernutrition (Black et al. 2013). Credit constraint, lack of information on access to healthcare and distance to health care are some of the contributing factors (Dupas, 2011; Advaryu and Nyshadham, 2015). Nonetheless, the literature does not give clear picture of the effects of access to health services on health outcomes. In some settings, access to health services improved health outcomes (Rosenzweig and Wolpin, 1982; Hossain, 1989). While in other settings, access to health services did not have an impact on health outcomes (Rosenzweig and Schultz, 1982; DaVanzo 1984; Strauss, 1990). Rosenzweig and Schultz (1982) studied the individual and community effects on child mortality and fertility in Colombia. It was found that in urban areas, in addition to mother's education, medical services availabilities, family planning activities, transportation infrastructure, are associated with child mortality ratios and fertility. However, there are no effects of programme interventions and medical facilities found on rural populations (Rosenzweig and Schultz, 1982). Although improvements in maternal and child health care can be achieved through a better public health provision, such provisions often struggle with low demand, low providers's effort, absenteeism and corruption in the recruitment process (Das et al., 2008; Weaver, 2016). Consequently, the long-run returns to public provisions of maternal and child health care are unclear (Advaryu and Nyshadham, 2015).

Village is the smallest government administrative unit in Indonesia. The larger administrative units are subdistrict, district/municipality, province and central goverment. There are two types of villages based on the rural and urban location. *Desa* is a village located in Indonesia's rural area and kelurahan is a village in urban area. Unlike urban village, whose leaders are appointed by district leaders, desa leader is elected through local village election by its people. Since 2007, all Indonesian villages in Generasi treatment subdistricts receive a fixed annual grant with an average of US $100,000 from the central government as one of the Indonesian Government strategies to support village governments and their

communities. A randomisation process selected 200 subdistricts to be assigned as treatment and 100 subdistricts to be assigned as control. The programme was implemented in five provinces, West Java, East Java, North Sulawesi, Gorontalo, and East Nusa Tenggara, which included 3000 villages and 12 thousand households that were randomly selected from the 300 Generasi programme subdistricts.

The Generasi block grants are aimed at assisting villages to become more financially independent, and each village can act with greater autonomy to manage and allocate the annual village budget. Based on Indonesian Home Affairs Minister Act number 37 in year 2007 regarding village financial administration, 30% of the fund is allocated for village government, and village consultative operating cost and 70% of the fund is allocated for community empowerment including initiating and managing the village-owned business. There are other community empowerment programmes implemented in other areas different from PNPM Generasi areas, namely PNPM infrastructure, PNPM Mandiri urban and rural. The PNPM Generasi programme is the only village-level community empowerment programme in the Generasi subdistricts, if a subdistrict received different programme then the subdistricts would be excluded from this programme. The use of funds for all PNPM programmes is strictly monitored and audited by the government and independent auditors.

PNPM Generasi, is specifically targeted at improving health and education outcomes at a village level. There are eight health indicators target set by the government to be achieved within the direct control of the village, the health indicators as the conditionalities below:

1. Expectant mothers attend four health checks at a health facility during their pregnancy

2. Expectant mothers receive and consume iron supplement tablets

3. Every childbirth process is assisted by trained health personnel
4. Post-natal mothers and babies attend two health checks
5. Babies receive complete immunisation
6. Weight gain of babies and other growth indicators each month according on age
7. Children aged 0-59 months are weighed once a month
8. Children aged 6-59 months consume supplemental vitamin A twice a year

Each village can propose funds to address one of the eight health indicators through various activities training and behavioural change communication, financial incentives for health workers, health facilities improvement, supplementary feeding activities, financial assitance for households. The funds will be disbursed as long as an activity address one of the eight health indicators and can provide evidence that the activity occured. There is a fund reporting and monitoring system to ensure that the funds are spent in an appropriate manner. Most villages will make use of the funds to the maximum amount and when fund uses are evaluated regularly, the funds that was not absorbed by certain activities could be switch to different activities when supported by a reasonable explanation.

In 2009, the government increased Generasi fund and encouraged village communities to allocate most of the funds for refurbishing Posyandu, the neighbourhood monthly health centres. Trained facilitators help each village elect an 11-member village management team, local facilitators and volunteers. The trained facilitators advise village team to decide the funds allocation within the village in meetings. Communities generate proposals to fund activities required to achieve the target indicators. As the results of the discussion, the management team will propose

the final Generasi budget allocation (Ministry of Home Affairs, 2008). Inter-village meetings and consultation workshops with local health and education service providers allow community leaders to obtain information, technical assistance, and support from the local health and education offices as well as to coordinate the use of Generasi funds with other health and education interventions in the area. Following these discussions, the elected management team makes the final Generasi budget allocation.

Two main activities for the community as part Generasi programme's main activities are Behavioural Change Communication such as health knowledge campaign for mothers and monthly supplementary feeding programme for mothers and children. Supplementary feeding fund can be given to particular households in the case that they have malnourished child based on the growth monitoring charts. Village facilitators are formed and appointed by the member of the village community which empower the community and monitor the programme implementation.

This study is related to a broader literature on the community role in the development and in public service delivery (Stiglitz, 2002; Olken, 2007; Banerjee and Duflo, 2008). Stiglitz claimed that consensus building, open dialog and participatory civil society are fundamental to long-term sustainable development. Pradhan et al. (2012) studied the role of community participation in improving educational quality by employing randomised experiment in Indonesia. They found that the measures to strengthen school committees, grant and training, showed limited effects. While measures which promoted ties between school committees and other parties, linkage and election, led to a greater engagement by education stakeholders.

On contrary, Olken (2007) found that increase in grassroot participation in monitoring Indonesian village road projects had minor impact on corruption, while on the other hand, substantial increase in government audits reduced corruption. Similarly, Banerjee and Duflo (2008) contended that the antipoverty policy involving the low-income beneficiaries to take charge in making the successful change for

themselves was ineffective. They raised concerns on antipoverty strategies which gave control to the beneficiaries who may not have the drive to do so.

Olken et al. (2014) analysed the same programme using the RCT data, found that the incentivised programme improved preventive health indicators at first predominantly in less-developed areas. However, incentive health effects weaked over time. In terms of education outcomes, overall school enrollments increased. This chapter contribution is that this study shows that the weak program effects may be attributed to the funds allocation priorities since the funds are allocated mostly to activities that does not have direct impact on the outcomes, at least in short and medium-term.

6.2 Literature Review

If health is regarded as human capital, individuals will invest in health when they valued the expected discounted future benefits exceed the costs. Grossman approach to the demand for health is drawn mainly on the human capital theory of Becker and Mincer (Grossman, 2000). The difference between health as output and medical care as an input had not been considered in theoretical and empirical works until 1972. The household production function model of consumer behaviour is utilised to account for the mismatch between health as output and medical care as one of the many inputs into the production function. The "shadow price" of health depends on numerous variables in addition to the price of medical care, the shadow price increases with age and decreases with education if more educated individuals are more efficient producers of health (Grossman, 2000).

Grossman (1972) argued that health capital is different from other forms of human capital. The major distinction is the primary justification for the demand for health model (Grossman, 1972). The main proposition of Grossman model of the demand for health viewed health as a durable capital stock, which yields an output

of healthy time (Grossman, 1972). Grossman's model explains the variations in health capital supply and demand curves. The study discovered upward shifts in the supply curve in response to increases in the rate of depreciation on the stock of health with age, and it traced upward shifts in the demand curve in response to increases in wage rate and education. The model's first prediction is that the quantity of demand for health capital declines over the life cycle if the depreciation rate increase with age and expenditure on health care would rise as individual ages. The second prediction of the model is that consumers' demand for health and healthcare is positively correlated with income. The third prediction of the model is that more educated individuals demand a larger optimal stock of health if education increases the efficiency of investment in health. Demand for health inputs is derived from the demand for health capital. The advantage of the model is that it allows us to investigate the demographic variables' effects without assumptions regarding whether the variables are positively or negatively correlated with consumers' taste for health.

One of the channels to achieve targeted health outcomes is through health knowledge. Knowledge can be built and accumulated through education and information acquisition. Literature have well documented the causal effects of education on health (Thomas, Strauss and Henriques, 1991; Strauss and Thomas, 1995). Education is positively related to health and fertility (Strauss and Thomas, 1995). The channel of better education improves health is through increased productivity (Grossman, 1972). Better education also improves knowledge of health-related behaviour (Becker, 1960; Grossman, 1972; Thomas et al., 1991). Thomas et al. (1991) investigated the impact of maternal education on child health and found that a mothers' education has a positive significant effect on child height.

Grossman's (2000) framework of the shadow price of health utilising household production function model of consumer behaviour depends on numerous other variables in addition to the health care cost.

In developing countries, particularly in rural areas where the quality of health services is lacking, the condition is exacerbated with inadequate financial incentives for public sector health workers. Hence, incentive-strengthening reforms are required but also need to vary based on institutional needs (Kremer and Glennerster, 2011). They argue that the reason why some expected health outcomes linked to a programme might not be achieved is attributable to behavioural factors such as present bias and limited attention.

Theory of limited attention model suggests that individuals are not fully aware of all aspects of decision making. Loewenstein and Prelec (1992) argue that a discounted utility model plays a central role in decision making when faced with an intertemporal choice. As a model of nonconstant discounting, it resulted in myopia or time-inconsistent behaviour where individuals impose a higher discount rate between the present and the future with than two periods in the future. This behaviour may result in procrastinating the activities that can gain a positive impact on the future, such as immunisation and visiting health facilities for preventive care. Rosenzweig and Schultz (1983) found that delaying prenatal care can lead to unexpected health outcomes of the baby. Delay in prenatal care by six months resulted in lower birth weight by 45 grams reduced fetal growth by 1.6 weeks (Rosenzweig and Schultz, 1983).

The remainder of the paper is organised as follows. Section 6.2 describes Indonesia healthcare system. Section 6.3 describes data and followed by empirical specification. Section 6.4 present the estimated programme impact on health outcomes. Section 5 discusses the results and concluded the chapter.

6.3 Institutional Background - Indonesian Healthcare system

Prior to 2004, not everyone was covered by health insurance. Civil servants, Army and Police personnel are covered by ASABRI (Insurance of Army forces

and Police) under the supervision of the Ministry of Defence and public insurance called Asuransi Kesehatan (ASKES). Employees of private companies are covered by private insurance. However, there was a large proportion of the Indonesian population who did not have permanent or formal employment were not covered by health insurance. Consequently, they must pay for their healthcare costs in both private and public healthcare facilities as access to healthcare facilities depends on the insurance.

Referring to the Act. No. 40, 2004 regarding Sistem Jaminan Sosial Nasional (National System of Social Insurance), every citizen has the rights of having social insurance, including health insurance. In 2004, the Indonesian Government launched the regional health insurance for poor people who cannot afford health insurance (Askeskin), provincial, district and municipal government health insurance (Jamkesda) in 2005, national community insurance (Jamkesmas) in 2008 by the Ministry of Health, and delivery insurance (Jampersal) in 2011 by the Ministry of Health where the insurance requires minimum fee through cross-subsidies (Agustina et al., 2018). In 2009, all the national insurance companies were merged become National Health Insurance, Jaminan Kesehatan Nasional (JKN).

There are several reforms related to midwives. The Indonesian Ministry of Health also allocates a designated fund for health which focuses on the readiness of health facilities for expectant mothers and childbirth. A village-based midwife programme was established in 1989 with targets of training and deploying 54 thousand midwives across the Indonesian archipelago, which was achieved by 1997, with over 96% of Indonesian population able to access the 54 thousand village-based midwives who equipped with small birthing units.

In 2006, the Ministry of Health had educated and assigned additional 50,000 village midwives through Bidan Desa programme (health.bmz.de). In 2013, the Ministry of Health provided midwives kits and 104,178 village midwives throughout all villages in Indonesia which claimed to have contributed to a substantial decrease

in maternal mortality (Performance Accountability Report, Ministry of Health, 2013). One of the targets of the Ministry of Health strategic goals is maternal and child health (MCH). The indicators include the childbirth process assisted by trained health personnel or midwife, post-maternal and neonatal visits, and baby and toddler growth checks. Between 2009 and 2013 the Ministry of Health had improved the indicator of childbirth assisted by skilled health personnel and achieved 90.88% of the total childbirths (Ministry of Health, 2013, <www.depkes.go.id>). The use of health facilities for childbirth also increased from 26% to 63% in 1997 and 2012, respectively (Shankar et al., 2008).

The Government launched the Village Midwife Programme in 1989, which requires one midwife in every village to provide primary health services for the village population and maternal and child health services (*kesehatan ibu dan anak*-KIA). The programme was rolled out in phased with priority was given to poor and remote areas (Frankenberg and Thomas, 2001).The services include prenatal care, child delivery, post-maternal care, family planning services and basic health services for newborns and children. Several studies have concluded the programme success in reducing the probability of infant mortality by 15 percent, improving BMI of reproductive-age women, child birth weight and height for age (Frankenberg, 1995; Frankenberg and Thomas, 2001; Frankenberg et al., 2005).

The village midwives charge small fees as the equipment and medications are supplied by the government through the Ministry of Health at district or subdistrict levels. On average, there are two Puskesmas-*subdistrict health centres* in each subdistrict, which locations should be accessible by all the villages within the subdistrict.

Village midwives work as civil servants who are appointed by the Ministry of Health. The village midwives' qualification is midwifery academy, a three-year professional degree after completing high school education. They are also required to attend one-year midwifery training after completing the degree. On average,

one village midwife serves a village population of 3500 and assisted 36 births annually (Indonesia.unfpa.org/sites/default/files/pub-pdf/Midwifery_IND.pdf). In the past, village midwives can also assist childbirth in their clinic. However, since 2010 they are not allowed to do so. The expectant mother must go to Puskesmas in the subdistrict for child delivery. This is expected to reduce the risk of maternal mortality if there are any complications.

6.4 Data and Dependent Variables

6.4.1 Data

The study utilises data from PNPM Generasi programme for both community and household levels data and household level data on mothers and children who lived in Generasi programme treatment and control villages.Generasi program data is the randomised controlled experiment obtained from Survey Pelayanan Kesehatan dan Pendidikan (SPKP), Health and Education Service Surveys from the World Bank (`http://microdata.worldbank.org/index.php/catalog/1047`). The first wave (2007) and the third wave (2009) surveys of Generasi programme are used. PNPM Generasi programme fund is administered within each village.

Each treatment Generasi subdistrict receives block grant with an average amount of US $100,000. Of the total Generasi subdistricts, 90% are in rural areas. Generasi targeted rural subdistricts which have participated in Subdistrict Development programme, for a minimum period of two years and have experience with village-level planning. There are no supply-readiness requirements since Generasi programme intends to improve less supply-ready areas. The randomisation for the treatment occurs at subdistrict levels. Randomizing at the subdistrict level is important since many health and education services, such as community health centers (puskesmas) and junior secondary schools, provide services to multiple villages within a subdistrict. The randomization process involved drawing 200 subdistricts assigned as

treatment out of 300 original subdistricts. The rest 100 subdistricts were assigned as control. Randomisation occured at the subdistrict level is crucial as health and education services, such as subdistrict health centers serve population from multiple villages within a subdistrict. The individuals for impact evaluation purpose are sampled from five provinces (West Java, East Java, North Sulawesi, Gorontalo, and East Nusa Tenggara) in 2,306 villages and 12,263 households that were randomly selected from the final 264 Generasi programme subdistricts. The 264 subdistricts were obtained because 36 out subdistricts were excluded from the programme due to receiving different community empowerment programmes.Finally 2,306 villages 1,536 treatment and 770 control villages were randomly selected as control areas which were stratified across districts. Five households were sampled per village. Attrition rate of households resurveyed in 2009 is 1% with no differences between treatment and control areas (Olken, et al., 2014).

The sample of mothers is obtained from the module questionnaire of ever married women or mothers aged 16-49 years old who were pregnant or had been pregnant within the last 24 months. Mothers who have been expecting within the last 24 months were asked about pregnancy, prenatal checks in different health facilities, and delivery records. The total number of ever married mothers aged between 16 and 49 years was 8,431 in 2007. The proportion of mothers who were expecting babies was 21.6%. The proportion of mothers who were using any form of contraception was 60% (3,987). The number of women who had natural delivery were 6,131 or 93.9% of total while 6.3% had childbirth with complications.

The number of children aged 0 to 36 months old sampled in 2007 were 13,400. The proportion of babies aged 0-11 months was 44.7%, children aged 1-2 years old was 34.8% and children aged 2-3 years old was 20.4%. The child module comprises questions whether they have health monitoring card, whether they visited Posyandu within the last three months, the number of Posyandu visits and services received, including supplementary meals and immunisations received (BCG, polio, measles,

hepatitis B and DPT). In additions, they were asked about the latest acute morbidity of the child and whether they were treated in one of the healthcare facilities.

In terms of healthcare facilities, Generasi programme surveys 300 Puskesmas -subdistrict health centres-, one from each subdistrict, 696 midwives and 1200 Posyandu. The sampling frame for midwives was from the record of midwives who work in Puskemas and the records of private practice midwives. Two midwives were selected from the Puskesmas records and two from private practice records (Sparrow et al. 2008). Health facilities were asked about medical supplies, equipment, staff and services provided.

In addition to PNPM Generasi survey data, a Management Information System (MIS) data, administrative data from the Ministry of Home Affairs during the first two years of the implementation is employed. The data comprises activities, number of beneficiaries, and the amount of funds allocation at the village level as part of the activity report from all of Generasi villages.

The data on all villages in Indonesia is obtained from village population census called Village Potential data (PODES). Village population census is conducted three times within ten years which survey more than 65 thousand villages. PODES data exhibits the characteristics of villages and depicts the development progress within each village.

6.4.2 Dependent Variables

Dependent variables included in this study are namely community participation in self-help activities [1], the utilisation of healthcare services by mothers aged between 16 and 49 years, whether expectant mothers visit the different health facilities for prenatal and post-maternal checks.

[1]Self-help activities are activities that are initiated and undertook by the people in villages or hamlets. The activities can range from building community facilities such as sports centres, roads, bridges and schools.

Table 6.1: List of Dependent Variables

Dependent Variables	Data Level	Results
Household community Participation	Household aggregated to village-level	Table 6.4
Availability Health facilities	Village-level	Table 6.5
Number of health personnel	Village-level	Table 6.6
Services provided to mothers in a village midwife	Individual midwife-level	Table 6.7
Services provided to children a village midwife	Individual midwife-level	Table 6.8
Services for baby delivery and post-maternal visits	Individual midwife-level	Tables 6.9 and 6.10
Mother's health knowledge	Individual level	Table 6.11
Mother's prenatal visits to health facilities	Individual aggregated to subdistrict-level	Tables 6.12 and 6.13
Pregnancy check services received by mothers	Individual aggregated to subdistrict-level	Table 6.14
Post-maternal checks in health facilities	Individual aggregated to subdistrict-level	Table 6.15
Post-maternal services received by babies	Individual aggregated to subdistrict-level	Table 6.16
Baby's neonatal mortality and livebirths	Individual aggregated to subdistrict-level	Table 6.17
Child's visits to Posyandu & services received	Individual aggregated to subdistrict-level	Tables 6.18 - 6.21
Child's accute morbidity	Individual aggregated to subdistrict-level	Table 6.22

Note:
Dependent Variables for different outcomes

The number of prenatal visits is differentiated into the first 3-month, the second 3-month and the last 3-month. Other indicators for dependent variables are whether mothers had assisted childbirth by skilled health personnel, a midwife or doctor, and whether expectant mothers received different types of standard services during check-up, iron supplement, and tetanus and toxoid vaccines (TT).

The dependent variables related with children are whether a Posyandu, the monthly health services present in the neighbourhood, in the hamlet, or in the village. Other variables are whether a child visited Posyandu regularly for growth monitoring and obtaining vitamin A, nutritious meal supplementation, whether they have health monitoring card and had completed immunisation required for the associated age.

The difference-in-differences estimated for outcomes on mother's sample included a number of covariates to increase precision at individual level characteristics. The control variables are age, age squared, education and dummy for working. All other estimates involving aggregation from individual-level data to village level averages do not include covariates. The list of dependent variables is summarised in Table 6.1.

Table 6.2: Baseline of characteristics and Balance Tests of Villages' health services between Generasi Programme Treatment and Control

Village Characteristics	Mean				
Variables	Control	Treatment	Difference	Std error	p_value
Any village maternal clinic?	0.776	0.782	0.006	0.018	0.746
Any Puskesmas?	0.125	0.127	0.002	0.014	0.911
Any Supporting Puskesmas ?	0.365	0.354	-0.011	0.021	0.612
Nbr of active Posyandu	2.439	2.491	0.052	0.089	0.560
Nbr of Village midwives	0.889	0.895	0.006	0.021	0.793
Nbr of private midwives	0.394	0.357	-0.037	0.035	0.290
Nbr of nurses	1.434	1.248	-0.186	0.156	0.232
Nbr of doctors	0.609	0.593	-0.016	0.054	0.770
Nbr of trad'l birth assistants	2.549	2.689	0.140	0.127	0.272

Note:
The results are calculated by employing PNPM Generasi Data 2007 and 2009 at village-level. Robust standard errors are clustered at subdistrict level. Number of villages = 2,306. * p<0.1, ** p<0.05, *** p <0.01

Baseline and Balance Tests of Villages' characteristics

Table 6.2 shows village characteristics on the baseline 2007 survey and balance test between treatment and control groups on several measures for health services. The measures including the presence of village maternal clinics, Puskesmas (subdistrict health centre), supporting Puskesmas, number of active Posyandu (monthly community health service), number of village midwives and private midwives, number of doctors and nurses and number of traditional birth assistants. The table shows that the means differences are not statistically significant, which suggests that the randomisation satisfactorily balanced treatment and control groups for all measures of health facilities and providers.

Baseline and Balance Tests of Mothers' characteristics

Table 6.3 presents the balance tests between mothers' characteristics in Generasi programme treatment and control areas. The characteristics include age, education, whether they work or not. Dependent variables tested include a minimum of four

Table 6.3: Baseline of characteristics and Balance Tests of Mothers between Generasi Programme Treatment and Control

Village Characteristics	Mean				
Variables	Control	Treatment	Difference	Std error	p_value
Age in years	27.400	28.310	0.91***	0.160	0.000
Education (at least 6 six years)	0.855	0.800	-0.055***	0.009	0.000
Working	0.206	0.221	0.015	0.010	0.138
Dependent variables					
Prenatal check >=4	0.802	0.748	-0.054***	0.010	0.000
Assisted delivery	0.810	0.782	-0.028***	0.010	0.006
Facility delivery	0.465	0.451	-0.014	0.014	0.352
Post-maternal check >=2	0.647	0.614	-0.032*	0.018	0.068

Note:
The results are calculated by employing PNPM Generasi Data 2007 and 2009. Number of mothers = 10,846. The data comprise mothers aged 16-49 who had a pregnancy or delivery within the past 24 months in 2007 and 2009. Analyses using OLS regression comparing the means between treatment and control groups at baseline. *p<0.1, ** p<0.05, *** p <0.01

prenatal checks. The results suggest that there are some significant differences in mothers' characteristics between treatment and control areas namely in mother's age, education, and for the dependent variables namely minimum of four times prenatal checks, delivery assisted by health personnel. These results can be expected as Generasi programme randomisation was performed at subdistrict level instead of household.

6.5 Empirical specification

The empirical analysis is performed to evaluate whether there is an impact of the Generasi programme on various dependent variables. The dependent variables are community participation, quality of health facilities, utilisation of healthcare facilities, health outcomes of mothers and young children. The impact is measured by performing difference-in-differences regression, controlling for differences at the baseline.

Using the difference-in-differences specification by comparing the outcomes from Generasi treatment areas ($D_i = 1$) with the outcomes that of control areas ($D_i = 0$). The average treatment effect is:

$$\beta = E[Y_{1,i}|X_i, D_i = 1] - E[Y_{0,i}|X_i, D_i = 0] \tag{6.1}$$

The baseline 2007 and 2009 data are used to estimate the following difference-in-differences specification

$$Y_{i_t} = \alpha Post_t + \beta(Post_t * D) + \gamma X_{it} + \mu_s \epsilon_{it} \tag{6.2}$$

- Y_{it} - the community participation, health outcomes for mothers and children and the quality health facilities
- D_i - a dummy variable of whether the village received Generasi treatment fund, 1 for treated and 0 otherwise
- $Post = 1$ for after treatment year 2009 and zero for 2007 baseline
- β - the parameter of interest which provides the difference-in-differences in health outcomes of mothers, children and quality of health facilities between the treatment and control groups before and after programme implementation
- Interaction variable for DiD estimate = $(Post_t * D_i)$
- X_{it} is set control variables to increase precision at individual level characteristics, age, age squared, education and dummy for working
- μ_s is sub-district fixed effect
- ϵ_{it} is unobserved idiosyncratic shocks
- The standard errors are clustered at subdistrict level.

Table 6.4: Difference-in-differences estimates of community participation, village decision making for self-help activities

	Decision by Head of			Decision through meeting in		
Variables	Viilage	Hamlet	Neighbourhood	Village.	Hamlet.	Neighbourhood.
Post	-0.12	-0.105	-0.083	-0.111	-0.033	-0.015
	(0.292)	(0.028)	(0.026)	(0.030)	(0.025)	(0.013)
Treatment effect	-0.021	0.008	0.02	-0.006	-0.005	-0.003
	(0.035)	(0.035)	(0.032)	(0.037)	(0.030)	(0.017)
No. of Obs.	4612	4612	4612	4612	4612	4612
R-Squared	0.045	0.021	0.013	0.028	0.003	0.002

Note:
The results are calculated by employing household-level data which was aggregated to village-level. Standard errors clustered at sub-district are reported in parenthesis. *p<0.1, ** p<0.05, *** p <0.01.

6.6 Empirical Results

6.6.1 Impact of PNPM Generasi on Community Participation

The PNPM Generasi programme impact on community participation are evaluated based on the village decision making for self-help activities. The decision-making process in self-help activities or *gotong royong* require households to participate. The self-help activities are including refurbishing Posyandu clinic, repairing public facilities, such as roads, bridges, drainage and sewage. The results on whether the decisions were made by the village head, the hamlet head, the neighbourhood head and whether the decisions were made through village meetings, hamlet meetings or neighbourhood meeting are presented in Table 6.4. The results suggests that there is a small increase in hamlet and neighbourhood (RT) heads in deciding who should participate in self-help activities but are not statistically significant. Moreover, the decisions made were not involving hamlet or village meetings.

6.6.2 Impact of PNPM Generasi on Health Facilities and Health Providers

The village characteristics module is served to provide information on village characteristics comprise demography information, health facilities, education facilities and community social participation. The respondents are village heads or the deputy if the head was not available at the time of interview. In this study, the difference-in-differences are estimated for health facilities available in every village and health personnel who provide health services within the village.

The results of villages' health facilities using difference-in-differences are presented in Table 6.7. The table is a result of Generasi programme impact on several dependent variables of villages characteristics for health facilities, the availability of supporting Puskesmas (subdistrict health centre) in a village, availability of supporting Puskesmas and village maternity clinic. The sample is villages from each Generasi treatment and control subdistrict. The estimate for supporting Puskesmas is significant at 10%, a positive effect on the number of supporting Puskesmas by 3.3 percentage points, while other estimates are negligible.

The results of the numbers of health provider who provide health services in a village are presented in Table 6.5. The table is a result of Generasi programme impact on several dependent variables of Villages characteristics for the number of health staff using difference-in-differences. The sample is villages from each Generasi treatment and control subdistrict. The difference-in-differences estimates for the number of village midwives, private midwives, doctors, nurses and traditional birth assistants suggest that Generasi programme impact are not significant.

6.6.3 Impact of PNPM Generasi on Midwives Services

Results for Process/ Activities Performed by Village Midwives

The PNPM Generasi programme impact on midwives are evaluated based on the location she conducted the activities and the services provided both to children

Table 6.5: Difference-in-differences estimates of availability of health facilities in a village

Dependent Variable	Any Puskesmas	Supporting Puskesmas	Village Maternity Clinic
post	0.0156**	0.018	0.037**
	(0.007)	(0.015)	(0.015)
treatment effect	-0.009	0.033*	0.00009
	(0.009)	(0.019)	(0.019)
No. of Obs.	4612	4612	4612
R Squared	0.002	0.011	0.006

Note:
The table is a result of Generasi programme impact on several dependent variables of villages' characteristics for health facilities using difference-in-differences. The sample is villages from Generasi treatment and control subdistricts. Standard errors clustered at sub-district are reported in parenthesis. *p<0.1, ** p<0.05, *** p <0.01.

Table 6.6: Difference-in-differences estimates of number of health personnel in a village

Dependent Variable	Village Midwife	Private Midwife	Doctor	Nurse	Traditional Birth Assistance
post	0.107***	0.115**	-0.114**	-0.221	-0.356***
	(0.033)	(0.057)	(0.055)	(0.181)	(0.096)
treatment effect	-0.003	0.038	0.042	0.133	-0.033
	(0.040)	(0.091)	(0.066)	(0.205)	(0.128)
No. of Obs.	4609	4597	4604	4598	4604
R Squared	0.014	0.003	0.005	0.001	0.015

Note:
The table is a results of number of health personnel in a village using difference-in-differences estimation. The sample is villages from Generasi treatment and control subdistricts. Standard errors clustered at sub-district are reported in parenthesis. *p<0.1, ** p<0.05, *** p <0.01.

Table 6.7: Difference-in-differences estimates of number of children who were given vitamin A by the midwife, whether the midwife visit Posyandu and the number of her Posyandu visits

Dependent Variable	Number of Children received vitamin A	Did Midwife Visit Posyandu?	Number of Posyandu visits
post	-10.78	0.241***	-0.0497
	(26.940)	(0.062)	(0.177)
treatment effect	27.28	-0.041	0.207
	(37.640)	(0.075)	(0.309)
No. of Obs	1249	1392	1180
R Squared	0.001	0.055	0.0009

Note:
The table is a results of services provided for children in a midwife clinic using difference-in-differences estimation. The sample is panel midwives from Generasi treatment and control subdistricts. Standard errors clustered at sub-district are reported in parenthesis. *p<0.1, ** p<0.05, *** p <0.01.

and mothers. The results for Posyandu visits and services provided are presented in Table 6.6. The table is a result of Generasi programme impact on dependent variables for midwife characteristics using difference-in-differences. The sample is midwives working in government and non-government health facilities. There is an increase in number of Posyandu visits last week and the number of children given vitamin A although not statistically significant.

Table 6.8 shows the estimates of services provided by a midwife during prenatal visits in midwife's clinics. The estimate of the number of pregnant mothers who received iron supplementation is positive significant at 10% level. However, other estimates on whether mothers receive tetanus-toxoid (TT) vaccine, number of pregnancy visits, are not significant. The estimate on complication cases referred to doctors is positive but not statistically significant.

Table 6.9 shows the estimates of the number of mothers who gave birth assisted by midwives in government facilities. The table is a result of Generasi programme

Table 6.8: Difference-in-differences estimates of services received in midwife clinic

		Pregnancy		Complication	
Dep. Variables	Mothers TT vacc	iron supp	visit	handled	refer
post	-1.971	-3.54	-0.49	-0.237	-0.206
	(4.257)	(2.695)	(2.155)	(0.869)	(0.676)
treatment effect	-2.631	6.288*	-2.927	-0.0121	0.175
	(6.075)	(3.730)	(4.414)	(1.149)	(0.756)
No. of Obs.	1101	1168	1151	1085	1099
R Squared	0.005	0.005	0.004	0.0006	0.0004

Note:
The table is a results of services provided for expectant mothers in a midwife clinic using difference-in-differences estimation. The sample is panel midwives from Generasi treatment and control subdistricts. Standard errors clustered at sub-district are reported in parenthesis. *p<0.1, ** p<0.05, *** p <0.01.

impact on dependent variables for services in government health facilities including subdistrict health centres. The sample is midwives working in government health facilities. The estimates show that there are negative effects in terms of number of childbirth assisted by midwives in government facilities, the number delivery with complication and referred complication due to complication although they are not statistically significant.

The estimates of services provided during the mother's post-maternal visits in midwife's ward are presented in Table 6.10. The table is a result of Generasi programme impact on dependent variables for services provided, including neonatal visits, the number babies whose weight were checked, the number of postpartum vitamin A and iron supplement given in midwife clinic using difference-in-differences. The estimates show there is a positive programme effect in the number babies whose weight were checked, post-partum vitamin A and iron provided although not statistically significant.

Table 6.9: Difference-in-differences estimates of delivery in government facilities by midwife

Dependent Variable	Delivery in Government Facilities	Delivery with Complication	Reffered Delivery
post	-1.675	0.039	-0.007
	(1.785)	(0.431)	(0.260)
treatment effect	-2.574	-0.539	-0.281
	(3.742)	(0.732)	(0.500)
No. of Obs.	1144	1057	1086
R Squared	0.008	0.003	0.002

Note:
The table is estimates of birth delivery in government facilities using difference-in-differences. The sample is midwives from Generasi treatment and control subdistricts. Standard errors clustered at sub-district are reported in parenthesis. *p<0.1, ** p<0.05, *** p <0.01.

Table 6.10: Difference-in-differences estimates of neonatal visits in midwife clinic

	Neonatal	Baby weight	Postpatrum	
Dep. Variables	visit	checked	vit A	iron
post	-1.882	2.693	-3.257**	-3.353**
	(2.686)	(36.330)	(1.564)	(1.594)
treatment effect	-0.171	30.11	4.768	1.912
	(4.577)	(43.240)	(3.070)	(2.140)
No. of Obs.	1137	1104	1133	1142
R-Squared	0.00176	0.00433	0.00308	0.0107

Note:
The table is estimates of neonatal services in midwife clinic using difference-in-differences. The sample is midwives from Generasi treatment and control subdistricts. Standard errors clustered at sub-district are reported in parenthesis. *p<0.1, ** p<0.05, *** p <0.01.

6.6.4 Impact of PNMPM Generasi on Mothers' and Outcomes

The PNPM Generasi programme impact evaluated on mothers' activities and outcomes. The data on mothers is sampled from mothers aged 16 to 49 years who were pregnant or pregnant within the last 24 months which collect information regarding mothers' health condition, pregnancy history, the use of contraception, the utilisation of health facilities and health knowledge. All the estimates are aggregated from individual level data into subdistrict level, with exception for the health knowledge estimates.

Table 6.11 shows the difference-in-differences estimates of mother's health knowledge as outcomes. The observations are panel mothers aged 16 to 49 from Generasi programme wave 1 and 3 who had a pregnancy or delivery within the past 24 months in 2007 and 2009. The correct answers dummy equals to 1 if the respondent answered at least 50% of the questions correctly. The treatment is marginally significant on the numbers of correct answers on health knowledge regarding; number of prenatal checks, when the baby should be breastfed after birth, at how many days the baby can start drink water, and how much liquid the baby should have when experiencing diarrhoea. As per column 1, the difference-in-differences estimate for the numbers of correct answers is marginally significant, which implied the knowledge of mothers increased by 30 percentage points by living in a Generasi treatment subdistrict. For individual question responses, the estimates on knowledge on when to feed babies with water and with liquid food are positive but only the knowledge on when to feed babies with liquid food is statistically significant.

In terms of health facility utilisation, health facilities visited by mothers for prenatal checks are presented in Tables 6.12, 6.13 and 6.14. The table is a result of Generasi programme impact on dependent variables of mother's prenatal visits. The sample comprises mothers aged 16-49 who had a pregnancy or delivery within

Table 6.11: Difference-in-differences estimates of mothers' health knowledge

	Correct	Knowledge			
Dep. Variables	answers	Prenatal	Bfed	Waterfed	Liqfed
post	0.145	-0.314	0.123	-0.019	-0.026
	(0.178)	(0.442)	(0.080)	(0.074)	(0.098)
treatment effect	0.301*	0.109	-0.046	0.127	0.168**
	(0.165)	(0.756)	(0.068)	(0.078)	(0.082)
age	0.091		0.062**	-0.039	0.023
	(0.075)		(0.028)	(0.032)	(0.035)
age_sq	-0.0012		-0.0008*	0.0006	-0.0002
	(0.001)		(0.000)	(0.001)	(0.001)
work	-0.151		-0.027	-0.024	-0.072
	(0.167)		(0.057)	(0.056)	(0.076)
d_educ	0.216		0.092	0.029	0.035
	(0.155)		(0.074)	(0.058)	(0.087)
No. of Obs.	470	454	470	470	470
R Squared	0.047	0.022	0.025	0.018	0.031

Note:
The table is estimates of mother's health knowledge on feeding babies using difference-in-differences. The sample is panel mothers aged 16-49 years from Generasi treatment and control subdistricts. Standard errors clustered at sub-district are reported in parenthesis. *p<0.1, ** p<0.05, *** p <0.01.

the past 24 months. Since there will be high attrition in using panel mothers who had pregnancy and delivery within 24 months across the 28 months timeline between June 2007 to October 2009, the outcomes were aggregated into subdistrict averages. Tables 6.11 and 6.12 show there are small effect in pregnancy check within the first, second 3-month of pregnancy but none are statistically significant.

Generasi programme impact on dependent variables of services received during prenatal visits is presented in Table 6.15. The table shows that there are small and negligible impact of the programme on postmaternal checks in private hospital and Puskesmas, 40 days after giving birth.

Table 6.16 present the estimates whether the baby's weight was checked during post-maternal visits and the weight of the babies. The treatment effect on whether the baby weight was check is positive, although not statistically significant. In

Table 6.12: Difference-in-differences estimates of which facilities visited for pregnancy checks within the first 3 months

Dependent Variable	Check in Government Facilities	Check with Village Midwife	Check with Private Midwife
post	-0.002	-0.076	-0.037
	(0.010)	(0.068)	(0.023)
tretment effect	0.019	0.045	0.016
	(0.013)	(0.079)	(0.028)
No. of Obs.	600	600	600
R Squared	0.015	0.007	0.013

Note:
The table is a result of Generasi programme impact on mother's prenatal visits using difference-in-differences. The outcomes are an average for each subsdistrict from sample of mothers aged 16-49 who had a pregnancy or delivery within the past 24 months in 2007 and 2009. Standard errors clustered at sub-district are reported in parenthesis. *p<0.1, ** p<0.05, *** p <0.01.

Table 6.13: Difference-in-differences estimates of which facilities visited for pregnancy checks within the first 3 months

	Check in		
Dep. Variables	private midwife	trad'l birth attend.	Posyandu
post	0.082	-0.031	0.167***
	(0.05)	(0.02)	(0.05)
treatment effect	-0.056	-0.026	0.076
	(0.06)	(0.03)	(0.07)
No. of Obs.	600	600	600
R Squared	0.011	0.05	0.128

Note:
The table is a result of Generasi programme impact on which facilities visited by mothers' for prenatal visits using difference-in-differences. The outcomes are an average for each subsdistrict from sample of mothers aged 16-49 who had a pregnancy or delivery within the past 24 months in 2007 and 2009. Standard errors clustered at sub-district are reported in parenthesis. *p<0.1, ** p<0.05, *** p <0.01.

Table 6.14: Difference-in-differences estimates of pregnancy check services received

Dependent Variable	Complication Info	Tetanus and Toxoid Vaccines	Iron Supplement	Number of Iron Supplement
post	0.226***	-0.013	-0.035	0.186**
	(0.022)	(0.029)	(0.024)	(0.080)
treatment effect	-0.02	-0.028	-0.043	0.128
	(0.028)	(0.038)	(0.030)	(0.097)
No. of Obs.	600	600	600	600
R-Squared	0.453	0.011	0.063	0.111

Note:
The table is a result of Generasi programme impact on mother's pregnancy check services received using difference-in-differences. The outcomes are an average figure for each subsdistrict from sample of mothers aged 16-49 who had a pregnancy or delivery within the past 24 months in 2007 and 2009. Standard errors clustered at sub-district are reported in parenthesis. *p<0.1, ** p<0.05, *** p <0.01.

Table 6.15: Difference-in-differences estimates of number of post-maternal checks within 40 days after giving birth

	Post maternal			
Dep. Variables	gov hospital	priv hospital	Puskesmas	village midwife
post	0.014	0.008	-0.035	-0.05
	(0.029)	(0.012)	(0.025)	(0.066)
treatment effect	-0.004	0.005	0.026	-0.013
	(0.035)	(0.018)	(0.027)	(0.082)
No. of Obs.	600	600	600	600
R Squared	0.001	0.004	0.012	0.007

Note:
The table is a result of Generasi programme impact on mother's post-maternal check services received using difference-in-differences. The outcomes are an average for each subsdistrict from sample of mothers aged 16-49 who had a pregnancy or delivery within the past 24 months in 2007 and 2009. Standard errors clustered at sub-dis trict are reported in parenthesis. *p<0.1, ** p<0.05, *** p <0.01.

Table 6.16: Difference-in-differences estimates of whether baby weight was check and the baby's weight

Dependent Variable	Was the Baby weight Checked ?	The Baby's Weight (in grams)
post	0.026	-16.39
	(0.017)	(30.230)
treatment effect	0.035	-16.33
	(0.021)	(38.780)
No. of Obs.	600	599
R Squared	0.079	0.007

Note:
The table is a result of Generasi programme impact on baby weight check during post-maternal visits using difference-in-differences. The outcomes are an average for each sub-sdistrict from sample of mothers aged 16-49 who had a pregnancy or delivery within the past 24 months in 2007 and 2009. Standard errors clustered at sub-district are reported in parenthesis. *p<0.1, ** p<0.05, *** p <0.01.

terms of the baby's weight, the estimate indicates that there is no significant difference between treatment and control areas.

Table 6.17 presents the difference-in-differences estimates on the programme effect on health outcomes in terms of neonatal mortality and live births. There is a slight reduction in the number of neonatal mortality and an increase in the number of live births, although the estimates are not statistically significant.

6.6.5 Impact of PNPM Generasi on Children aged 0-36 months Outcomes

The PNPM Generasi programme impact evaluated on children outcomes including Posyandu visits, services received during the visits and health outcomes. The sample comprises children aged 0 to 36 months which are then aggregated into subdistrict level. The difference-in-differences estimates for whether a child visited Posyandu (monthly health service) and the services received are presented in Table

Table 6.17: Difference-in-differences estimates of childbirth types

Variables	Neonatal mortality	Livebirth
post	0.03	-0.02
	(0.029)	(0.034)
treatment effect	-0.005	0.025
	(0.037)	(0.039)
No. of Obs.	600	600
R Squared	0.007	0.001

Note:
The table is a result of Generasi programme impact on childbirth types using difference-in-differences. The outcomes are an average for each subsdistrict from sample of mothers aged 16-49 who had a pregnancy or delivery within the past 24 months in 2007 and 2009. Standard errors clustered at sub-district are reported in parenthesis. *p<0.1, ** p<0.05, *** p <0.01.

6.18. The table shows that there is a significant effect in whether a child visiting Posyandu within the last three months, the difference is 6.4 percentage points. However, there are no significant differences between treatment and control areas with respect to whether there is a Posyandu within the neighbourhood, hamlet or the village. This is partly because the programme focuses on refurbishing Posyandu that could still be managed and discarding the Posyandu which were abandoned and not active anymore. The objectives are to improve the services to the community in the area served by the Posyandu.

Table 6.19 is a result of Generasi programme impact on the number of child's visits to Posyandu and services received. The table shows that the estimate for nutritious meals served during the monthly health services positive significant. As per column 3, the effect is positive significant by 13 percentage points. These results can be explained by the high proportion of the health fund which was allocated for supplementary feeding programmes was 41% of the total fund.

Table 6.18: Difference-in-differences estimates of whether child ever visited Posyandu and the Posyandu location

	Visit Posyandu	Posyandu in		
Variables	in 3 month	neighborhood	hamlet	village
post	-0.011	-0.002	-0.159***	-0.018
	(0.016)	(0.020)	(0.058)	(0.028)
treatmet effect	0.064***	0.0264	0.0453	0.03
	(0.019)	(0.030)	(0.070)	(0.040)
No. of Obs.	600	597	596	596
R-Squared	0.081	0.005	0.046	0.004

Note:
The table is a result of Generasi programme impact on whether a chilld Posyandu using difference-in-differences. The outcomes are an average for each subsdistrict from sample of children aged 0-36 months in 2007 and 2009. Standard errors clustered clustered at subdistrict at sub-district are reported in parenthesis. *p<0.1, ** p<0.05, *** <0.01.

Table 6.19: Difference-in-differences estimates of Posyandu visits and services received

Dependent Variable	Number of Posyandu Visits	Weight Check	Nutritious Meal	Receive Vitamin A
post	0.01	0.013***	0.060***	-0.063***
	(0.084)	(0.098)	(0.020)	(0.023)
treatment effect	0.171	-0.042	0.134***	-0.044
	(0.113)	(0.006)	(0.028)	(0.029)
No. of Obs.	600	600	600	600
R-Squared	0.021	0.041	0.28	0.121

Note:
The table is a result of Generasi programme impact on services received during Posyandu using difference-in-differences. The outcomes are an average for each subsdistrict from sample of children aged 0-36 months in 2007 and 2009. Standard errors clustered clustered at subdistrict at sub-district are reported in parenthesis. *p<0.1, ** p<0.05, *** p <0.01.

Table 6.20: Difference-in-differences estimates of number of children receiving Posyandu services

Dependent Variable	Receive Immunisation	Health Check	Health Advice	Midwife Attending
post	0.195***	-0.064**	-0.059***	-0.018
	(0.036)	(0.027)	(0.022)	(0.017)
treatment effect	0.008	0.022	-0.0003	0.004
	(0.049)	(0.032)	(0.027)	(0.020)
No. of Obs.	600	600	600	600
R Squared	0.169	0.037	0.065	0.01

Note:
The table is a result of Generasi programme impact on the number of childrem received services during Posyandu using difference-in-differences. The outcomes are an average for each subsdistrict from sample of children aged 0-36 months in 2007 and 2009. Standard errors clustered clustered at subdistrict at sub-district are reported in parenthesis. *p<0.1, ** p<0.05, *** p <0.01.

Table 6.20 shows the number of children receiving Posyandu services during the monthly Posyandu visits. The programme effects of whether the child receive immunisation, health check and health advise are small and statistically insignificant. Immunisation might not increase as expected due to the social and cultural belief that the vaccines is suspected to have a harmful effect such as fever (Adato, Roopnaraine and Becker, 2011). This may also be explained by the lack of awareness on vaccines' benefits. Immunisation might not increase as expected due to the social and cultural belief that the vaccines is suspected to have a harmful effect such as fever (Adato, Roopnaraine and Becker, 2011). This may also be explained by the lack of awareness on vaccines' benefits.

Table 6.21 shows the difference-in-differences estimates of whether people need to pay for Posyandu services fee and whether they had health monitoring card or mother-child health card. The estimate for whether child has health monitoring card is positive significant, but the other two estimates are negligible.

Table 6.21: Difference-in-differences estimates of whether people need to pay for Posyandu services and whether the child has health monitoring card and mother-child health card

Dependent Variable	Need to pay for Posyandu	Health Monitoring Card	Mother-Child Health Card
post	-0.049***	0.052***	-0.113***
	(0.014)	(0.018)	(0.027)
treatment effect	0.005	0.062***	0.018
	(0.018)	(0.021)	(0.034)
No. of Obs.	600	600	600
R Squared	0.08	0.205	0.112

Note:
The table is a result of Generasi programme impact on a number of outcomes using difference-in-differences. The outcomes are an average for each subsdistrict from sample of children aged 0-36 months in 2007 and 2009. *p<0.1, ** p<0.05, *** p <0.01.

Table 6.22 shows that the PKH programme effects on child's acute morbidity including, diarrhoea within one month, the number of times had diarrhoea, had high fever or cough. The estimates for child acute morbidity are small and statistically insignificant.

The overall results show that apart from positive significant programme efects on pregnant mothers who received iron supplement, whether the child visiting Posyandu and supplementary feeding provided, most of other estimates are negligible. The availability of health providers, availability of health equipment (see appendix C), services provided, mothers' and children's health outcomes are not statistically significant. These results might be explained by village public spending allocation in figure 6.1.

There are several channels which can lead programme conditionalities to achieve targeted health outcomes. The first channel is through improvement in healthcare facilities, as Generasi programme allocated 16% of the funds to improve infrastructure, facilities and equipment. Generasi activities involve in refurbishing and

Table 6.22: Difference-in-differences estimates of the child acute morbidity

Dependent Variable	Diarrhea in 1 Month	Number of Diarrhea	High Fever	Cough Problem
post	-0.032*	0.069	-0.012	-0.063***
	(0.019)	(0.160)	(0.024)	(0.023)
treatment effect	0.001	-0.084	-0.004	0.0126
	(0.022)	(0.214)	(0.028)	(0.027)
No. of Obs.	600	600	600	600
R Squared	0.032	0.0005	0.004	0.056

Note:
The table is a result of Generasi programme impact on child accute morbidity using difference-in-differences. The outcomes are an average for each subsdistrict from sample of children aged 0-36 months in 2007 and 2009.Standard errors clustered at sub-district are reported in parenthesis. *p<0.1, ** p<0.05, *** p <0.01.

establishing Posyandu and maternal waiting homes if there was none in a neighbourhood. The second channel is through improving mothers' health knowledge, which can be achieved through attending the behavioural change communication programme that is run by the Generasi village facilitator which coordinate with Posyandu cadres and the village head.

The third channel is through increasing access to healthcare services by reducing financial constraint. Over ninety percent of the villages gave financial assistance to access healthcare for its people. In 2009, there were 1,095 out of 6,182 or about 18 percent of female respondents who received financial assistance to access health services. About 175 or 17 percent of the mothers who received financial assistance used it for transportation and health services subsidy.

Generasi Management Information System (MIS) administrative data from the first two years is obtained from the Ministry of Home Affairs. Figure 6.1 shows the allocation of Generasi health fund. The figure shows that the health fund was

mostly allocated to supplementary feeding programmes (41%). The second highest allocation was for financial assistance to access health services including subsidy and transportation allowance (27%); followed by infrastructure (16%), facilities and equipment (9%), financial incentives for health workers (4%), training and behaviour change communication or campaign (3%). Despite being the second largest allocation, in terms of the number of women who received it, financial assistance for mothers to access health services proportion is only about 15 percent of the total female beneficiaries.

The allocation of Generasi fund could imply the villages' public spending was prioritised for activities that is visible. This spending priority can be part of a moral hazard problem when the head of villages have incentives to allocate the fund for their popularity, which benefits their interests. As for villages the people can elect their leader, a popular policy can be used as an incentive by the village heads to get re-elected. Although there is a supervisory body in villages, the position is subordinated to the village head.

6.6.6 Impact on Village Health Facilities Based on Podes Data 2007 and 2011

Difference-indifferences estimates PNPM programme impact on health facilities and health personnel in 2006 and 2011 are presented in Table 6.22. The villages in Podes were the ones who were matched with districts of PNPM Generasi treatment and control areas. The estimates for the number of village maternal clinics,Posyandu, number of general practitioners (GPs) and number of female doctors are positive but only the estimates for the number of Posyandu and the number GPs are statistically significant.

Threats to Identification

This section explores the threat to identification possibilities. First, since there was a plan to expand the Generasi programmes in more areas, it is possible that

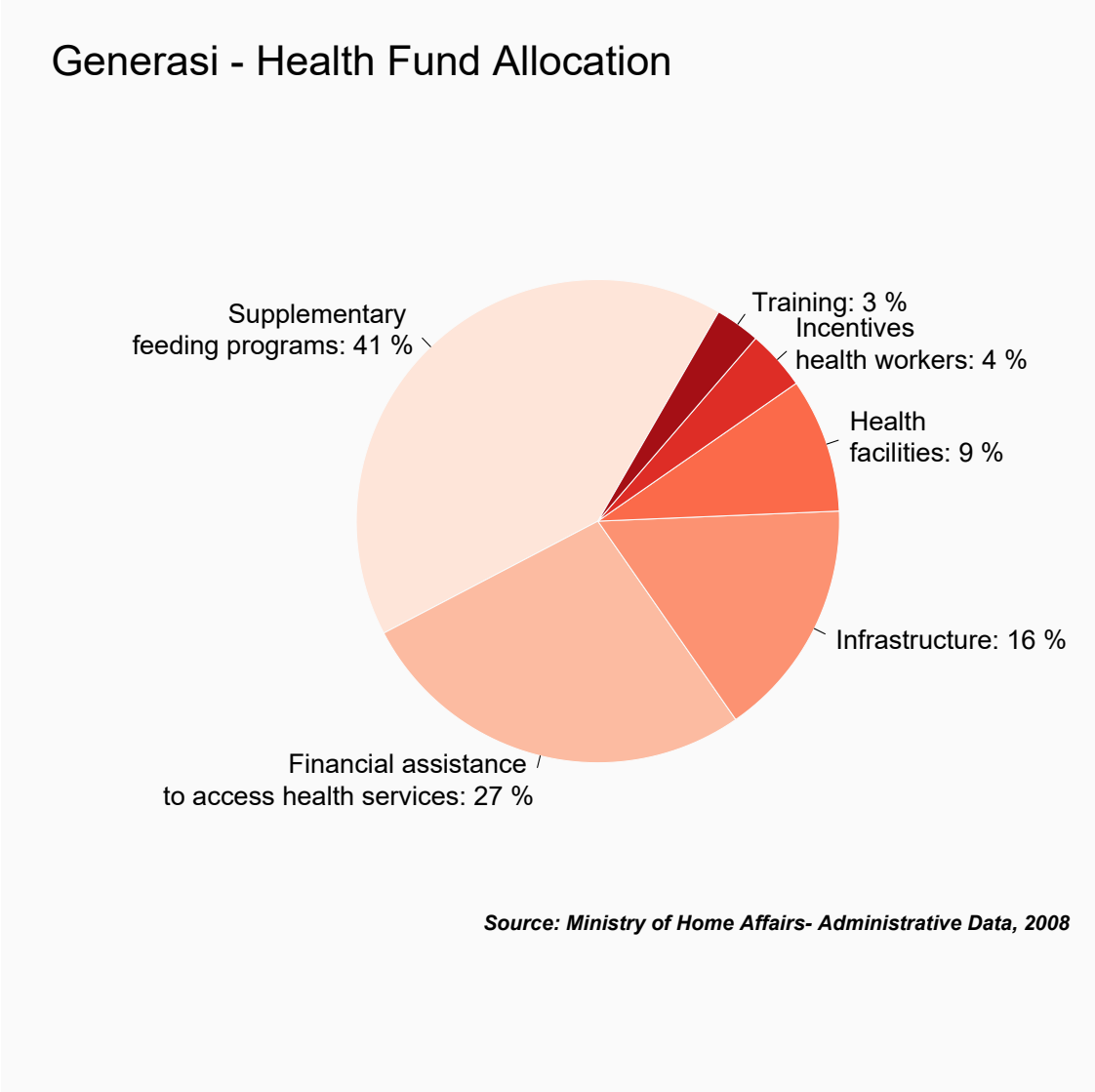

Figure 6.1: Public Spending Allocation of the Villages

between 2009 and 2011 some villages within a treatment subdistrict changed into a control subdistrict and vice versa. Second, it is possible that mothers and children in migrated from non-Generasi programme villages to Generasi treatment villages between 2011 and 2014. In this chapter, the village status of Generasi programme treatment assignment in 2011 is used. In this chapter the threats to identification is acknowledged as part of its limitation.

Table 6.23: Difference-in-differences Estimates of the Impact of PNPM Generasi on the Village Health Providers using Podes Data 2006 and 2011

Outcome Variables	Control mean	Treatment Effect	SE
Number of midwives	1.159	-0.024	(0.053)
Number of village maternal clinic	0.501	0.064	(0.051)
Number of Posyandu (Monthly health centres)	3.962	1.285***	(0.423)
Number of traditional birth assistants	1.971	0.124	(0.135)
Number of General Practitioners (GPs)	0.259	0.046*	(0.023)
Number of male doctors	0.189	-0.010	(0.020)
Number of female doctors	0.106	0.011	(0.020)
Number of Puskesmas	0.109	0.004	(0.006)
Number of Supporting Puskesmas	0.288	-0.011	(0.012)
Observation numbers	7,318		

Note:
Data villages' number of health providers in Generasi village from Village Potential (Podes) data year 2007 and 2011. Analysis using difference-in-differences with district fixed effect. Standard errors are clustered at subdistrict level. *p<0.1, ** p<0.05, *** p <0.01.

6.7 Discussion and Conclusion

This chapter investigates the impact of a National Programme of Community Empowerment, PNPM Generasi health program, on the community participation, quality of community health facilities, utilisation of healthcare facilities, and health outcomes of mothers aged 16 to 49 and children aged 0 to 36 months. The PNPM Generasi programme was implemented at a village level. The data employed are village-level data, household and individual level data on mothers and children, health personnel and healthcare facilities data. Health personnel data includes midwives and Posyandu cadres' characteristics data. Institutions' characteristics and facilities data include villages and subdistrict community health centres. Generasi programme impact is estimated using difference-in-differences specification.

In terms of community participation, the programme does not have any impact on the decision-making process for community self-help activities. The dependent variables are whether the decisions were made by the village head, the hamlet head,

the neighbourhood head, through village meetings, hamlet meetings or neighbourhood meetings. The results suggest that none of the estimates for community participation outcomes variables is significant.

Several channels can lead programme conditionalities to achieve targeted health outcomes. The first channel expected to achieve targeted health outcomes is through improvement in healthcare facilities, measured by the availability of health personnel, equipment, supplies of vaccines and medicines. The results suggest that the programme did not have significant impact on the quality of healthcare facilities. The difference-in-difference estimates also suggest that there was no significant difference in healthcare facilities utilisation between the mothers who live in the programme treatment and control areas.

Most of the statistically insignificant estimates suggest that the national programme of community empowerment (PNPM) Generasi health block grant does not have significant impact on the targeted outcomes. The results are aligned with Olken (2007), Banerjee and Duflo (2008) who found that the low-income population may not gain control on their communities and make successful changes by merely participating.

One of the channels to achieve targeted health outcomes is through health knowledge. The difference-in-differences estimate of health knowledge between mothers living in Generasi treatment and control subdistrict is marginally significant which implied that the behavioural health campaign in Generasi treatment areas increased the mothers' health knowledge by 30 percentage point. Despite estimates of health knowledge, there is no appreciable impact on the outcomes of mothers with respect to prenatal checks in different health facilities within the first three months, or postnatal checks within 40 days of giving birth.

Overall, there is a significant difference in whether a child visiting Posyandu within the last three months in terms of child visit to the monthly health service

(Posyandu), the difference is six percentage points. The empirical estimate nutritious meals served during the Posyandu sessions is always positive significant both by employing individuals and data aggregated into to subdistricts level. The programme possibly has heterogeneous effects on Posyandu, there is positive significant effect in terms of whether a child attending Posyandu within the last three months. However, the programme effects on whether there is a Posyandu centres within neighbourhood, hamlet or village are statistically insignificant. This fact might be explained by the village administration was trying to improve the quality of the Posyandu, rather than the quantity. This was done by refurbishing current Posyandu clinics and discarding the ones that are no longer needed.

In conclusion, the community Generasi programme does not seem to have significant impact on health outcomes of mothers and children. These results are not so surprising as the programme had only been implemented for two years and they are in line with the findings of the literature. The null effects may be due to the liquidity constraint and information access to quality care (Dupas, 2011; Adhvaryu and Nyshadham, 2015). Public provision in health facilities also often suffer from low demand and low efforts from health providers which will adversely affecting quality ((Das et al., 2008; Weaver, 2016).

The actual programme fund allocation might better explain the above results. The significant results of supplementary feeding may be attributed to the health fund allocation for the activities which comprised 41 percent of the total fund and in terms of the number of beneficiaries who received the programme comprised 36 percent of the total mothers. The second highest allocation was for financial assistance to access health services, 27 percent of the total allocation. However, in terms of beneficiary numbers, it was only 15 percent of total mothers. These results can partially be explained by the fact that the funds were allocated mostly to activities that are visible but may not have direct impact on community participation and

health outcomes. The allocation of Generasi fund could imply that the villages' public spending was prioritised for activities that are popular for political reason.

7
Conclusions

This thesis aims to provide an examination of the labour, education and health-related policy in Indonesia. The thesis consists of three empirical analyses; an examination of the impact of a randomised controlled trials (RCT) of household conditional cash transfer programme on female labour participation, an investigation of the effects of the enactment of nine-year compulsory schooling law on educational and work outcomes, and an evaluation of the impact of a national community empowerment programme on community participation and health services utilisation and health outcomes.

The effects of conditional cash transfer programme are evaluated by employing difference-in-differences specification and instrumental variable technique as empirical strategy to address the endogeneity of conversion from treatment became control and vice versa. The thesis reveals that the conditional cash transfer programme has no impact on female work outcomes in short-term, in 2009, or in medium-term, in 2013. The treatment effect is only significant in reducing work in medium term by 6.9 percentage points using IV estimations. The findings are aligned with other findings on CCT by Skoufias and Di Maro (2008) and Banerjee et al. (2015) who studied seven CCTs in six developing countries including Indonesia,

where they did not find any significant effect on work outcomes. The results reflect similarities to the study in Mexico, Honduras, and Nicaragua which indicated that the effects of the CCT programmes on adults labour participation were negative, small and insignificant (Alzua et al. 2013).

Further, the results also suggest that the programme has a positive significant effect on fertility, both in short-term and medium-term. The results shows that the programme significantly increased fertility by 2.2 and 4.8 percentage points in 2009 and 2013, respectively. These estimates show similarities to those obtained by CCT impact in the short run in Honduras which increased fertility by 2-4 percentage points (Stecklov et al., 2006) which might reduced female labour participation in medium-term. This may explain why the programme does not have clear impact on female labour participation. The empowerment effect might be cancelled out by income effect and the increase in fertility.

Other possible cause is the size of the cash transfer. On average, the annual cash transfer amount is 15% of the family annualised expenditure. In terms of the size of the transfer, it is relatively lower than inheritance, hence it may not provide more authority for the women in the family. A recent study on the effects of India Hindu Succession Act finds that the policy had positive impact on labour supply (Heath and Tan, 2018). The policy which enables women in India to receive inheritance had increased female intra-household bargaining and autonomy thereby empowered them to decide to enter high paying job. The India Hindu Succession Act also had seen improvements in women's health, but not in fertility.

In terms of policy implication, it can be concluded that the Indonesian conditional cash transfer programme did not motivate or deter the work of the beneficiaries. This result is aligned with the previous studies on the effect of cash transfer programmes in developing countries.

The generalisability of the results is subject to certain limitations. First, it is not possible the disentangle between the effect of empowerment and the income

effects, this is partly because the only information on participants' work is only at the extensive margin, while work hours data is unavailable. How to disentangle the effect of empowerment and the magnitude of income effect remains a problem for further reseacrch. Second, the beneficiaries are within five percent of the lowest income population in Indonesia, thus if applied to different percentile of the socioeconomic status, it is not clear whether similar results are expected.

Chapter 5 investigates the effect of the change in Indonesia's compulsory schooling law on educational and work outcomes. The causal effects of education on work outcomes have been well documented (Angrist and Krueger, 1991; Behrman and Deolalikar, 1993; Card, 1999; Acemoglu and Angrist, 2000; Duflo, 2001; Oreopoulos, 2006). Better education can increase the likelihood to work for pay and to earn higher income. The study exploits the exogenous variation in the likelihood to complete at least nine years of schooling and work outcomes by the change in compulsory schooling law in Indonesia enacted in 1994 as a source of identification.

There are currently few studies on the impact of compulsory education in developing countries. Several studies examined the impact of longer school year implemented in all education levels in Indonesia and impact of large school construction project, but none has examined the impact of Indonesia's free nine-year compulsory schooling policy on working outcomes.

This study applies a fuzzy regression discontinuity design which exploits the compulsory schooling law enactment as an exogenous variation. The policy mandated children to stay at school for at least nine years. Prior to 1994, children were only required to spend six years at school. Completing nine years education is not deterministic because of the the tenuous enforcement. In addition to no minimum attendance requirement, parents may decide not to abide with the policy without apparent consequences.

The treatment of completing at least nine years of education is instrumented with the time of birth dummy. Individuals who were born just after the cut-off

point, are 5.2 percent more likely to complete at least nine years of education. The second stage estimates of 2SLS regressions on log of average monthly wages is 27.3 percentage point due to completing additional three years of junior secondary schooling or 9 percentage points per year. Although not statistically significant, the estimate is comparable to that of Duflo (2001) who found that each constructed primary school per 1000 children resulted in 0.12 to 0.19 years average increase in education and between 1.5 and 2.7 percent increase in wages which equivalent to between 12 and 13.5 percent increase in wages per additional year in primary school. The result is similar to those obtained by Oreopolous (2006), between 10 and 15 percent higher in earnings for one additional year of compulsory schooling.

Subsequently, local linear regressions are employed using fuzzy rdrobust Stata command. The local linear estimates of compulsory schooling on working for pay are positive ranging between 2.8% and 3.6%. Significant effect is also found on the probability of individual worked in the formal sectors. The findings suggest that the compulsory schooling policy increased educational attainment and the increase in educational attainment increased the probability of work for pay and work in the formal sectors.

It is important to note the limitation of this study is that the compulsory schooling law is not comparable to those implemented in developed countries. The compulsory schooling is different due to the differences in the degree of the enforcement. There is no minimum attendance requirement. The compulsory schooling law is more emphasised on the government's responsibility in providing access to free basic education for all the people. The government is more encouraging rather than forcing the pupil to stay in school since the government have limited resources to monitor the implementation.

Chapter 6 evaluates the effects of the Generasi health block grant, a national programme of community empowerment on community participation and the quality of community health facilities, utilisation of healthcare facilities, health outcomes

of mothers aged 16 to 49 and children aged 0 to 36 months using difference-in-differences technique. The results from Generasi community empowerment programme suggests that the programme does not have an impact on village decision-making process for community self-help activities.

The programme suggests a marginally significant positive effect on mothers' health knowledge by 30 percentage points which implied the health campaign in Generasi treatment areas increased the health knowledge of mothers. Despite estimates of health knowledge, there is no appreciable impact in health outcomes on health facilities utilisation by mothers. The programme is expected to achieve the targeted health outcomes through the of quality improvement in healthcare facilities. However, the results suggest that the programme did not have significant impact on the quality of healthcare facilities which measured by availability of equipment, supplies of vaccines and medication.

Overall, for children empirical results, with regards to child visit to the monthly health service (Posyandu), there is a significant difference in whether child visiting Posyandu within the last three months, the difference is six percentage points. The empirical estimates for children, nutritious meals served during the Posyandu sessions are all positive significant.

The findings of this study have several practical implications. First, the time frame between 2007 and 2009 might not enough to pick up the program's effect particularly on health outcomes. Second, the programme fund allocation may explain why the effects are not significant. The significant results of supplementary feeding may be attributed to the health fund allocation to the activities which comprised 41 percent of the total fund. In terms of the number who received the program, it comprised 36 percent of the total mothers. The second highest allocation was for financial assistance to access health services, 27 percent of the total allocation. However, in terms of beneficiary numbers it only comprised 15 percent of total mothers. In conclusion, the community Generasi programme does

not seem to have impacts on health outcomes of mothers and children. Although these results are a bit surprising, they are in line with the findings of the literature (Fiszbein et al., 2009). The insignificant effects may be due to the liquidity constraint and information access to quality care (Dupas, 2011; Adhvaryu and Nyshadham, 2015). Public provision in health facilities also often suffer from low demand and low efforts from health providers which will adversely affecting quality (Das et al., 2008; Weaver, 2016). The implication for policy maker is how to design a policy which can induce people's behaviour not only to the activity indicators but also to encourage healthier environment which improve final outcomes. The challenge is to design complementary actions for policies which improve the quality the supply of education and health services and policies which promote healthier and more stimulating environment (Fiszbein et al., 2009).

This results may also be explained by the fact that the funds were allocated mostly to activities that were visible but may not have direct impact on health outcomes. The allocation of Generasi fund can imply that the villages' public spending was prioritised for activities that is visible or popular for political reason.

The interpretation of the results is also subject to certain limitations. The information on health facility utilisation such as prenatal checks and postmaternal visits were self-assessed by the respondents. Similarly, information on health outcomes such child as morbidity was also self-assessed.

The results of this thesis reveal that the government's investment in human capital in the form of cash transfers and community health block grant suggests no substantial impact on the assessed outcomes. While the nine-year compulsory schooling has a positive effect on educational attainment and the probability of working in the formal sectors but does not indicate a significant effect on wages. These programmes may need to be complemented with other interventions such as employment-related workshops and trainings programmes. Adequate health and

education facilities are also need to be available and easily accessed by the beneficiaries. With regards to future research opportunities, latest data collected on the CCT can be used to evaluate the long-term programme impact as the programme is still ongoing. Similarly, the effect of nine-year compulsory schooling can be evaluated in the future when the young cohort are older, as in this study the oldest birth cohort were 35 years old in 2014 when the work outcomes were evaluated.

8
Appendices

8.1 Appendix A

Table 8.1: Means of educational outcomes at pre-program by primary and secondary school

Variable name	Primary	Secondary
Enrollment	0.970	0.727
Attendance	0.975	0.965
Language test score	71.550	76.650
Math test score	50.450	64.100
Number observation	8457.000	3041.000

Note:
Standard errors clustered at sub-district are reported in parenthesis. *p<0.1, ** p<0.05, *** p <0.01.

Table 8.2: Difference-in-differences Estimates on Educational Outcomes for Primary School Aged Children

Variables	Post	SE	Treatment effect	SE
Attendance	-0.003	(0.004)	0.008	(0.006)
Attendance (85% attendance=1)	-0.035***	(0.006)	0.007	(0.009)
Enrollment	-0.046***	(0.006)	0.037***	(0.007)
Maths test scores	0.138***	(0.011)	0.025	(0.017)
Language test scores	0.181***	(0.011)	0.017	(0.017)
Number observation	9070			

Note:
The table is a result of cash transfer impact on educational outcomes children aged between 6 and 12. Standard errors clustered at sub-district are reported in parenthesis. *p<0.1, ** p<0.05, *** p <0.01.

Table 8.3: Difference-in-differences Estimates on Educational Outcomes for Junior Secondary School Aged Children

Variables	Post	SE	Treatment effect	SE
Attendance	0.021**	(0.009)	-0.028**	(0.011)
Attendance (85% attendance=1)	0.023	(0.033)	-0.052	(0.042)
Enrollment	-0.168***	(0.014)	0.023	(0.020)
Number observation	5976			

Note:
The table is a result of cash transfer impact on attendance and with control variables are travelling time to school, cost of schooling, wage work. The sample is children aged between 13 and 15. Standard errors clustered at subdistrict level, are reported in parentesis. *** p <0.01, ** p<0.05, *p<0.1.

8.2 Appendix B

Table 8.4: Difference-in-differences estimates of number of childbirth-related equipment in the Puskesmas

Variables	Post	SE	Treatment effect	SE	R-Squared
Number of stethoscopes	0.364	(0.435)	-0.101	(0.514)	0.006
Number of forceps	0.796	(0.602)	-1.319*	(0.727)	0.012
Number speculum	-1.313	(0.946)	1.032	(1.237)	0.006
Number vaccine thermos	-3.323**	(1.558)	1.851	(1.858)	0.023
Number of observations	596				

Note:
The table is a result of Generasi program impact on several dependent variables for Puskesmas characteristics using difference-in-differences. The sample is Puskesmas from each Generasi treatment and control subdistrict. Standard errors clustered at sub-district are reported in parenthesis. *p<0.1, ** p<0.05, *** p <0.01.

Table 8.5: Difference-in-differences estimates of number of child birth-related equipment in the mid wife clinics

Variables	Post	SE	Treatment effect	SE	R-Squared
Number of stethoscopes	0.175*	(0.091)	-0.014	(0.102)	0.027
Number of forceps	-0.058	(0.062)	0.108	(0.068)	0.006
Number speculum	0.621***	(0.208)	-0.276	(0.276)	0.018
Number vaccine thermos	-0.224	(0.310)	0.115	(0.381)	0.002
Number of observations	1384				

Note:
The table is a result of Generasi program impact on dependent variables for equipment in midwife clinic using difference-in-differences. The sample is midwives working in government and non-government health facilities. Standard errors clustered at sub-district are reported in parenthesis. *p<0.1, ** p<0.05, *** p <0.01.

Table 8.6: Difference-in-differences estimates of Puskesmas clinic facilities and coverage of villages and patients

Variables	Post	SE	Treatment effect	SE	R-Squared
Bascic Obstetric and Neonatal Emergency units	-0.141	(0.126)	0.750	(0.811)	0.028
Number of villages covered by a Puskesmas	-0.089	(0.151)	-1.424	(0.933)	0.024
Number of existing patients	-71.010	(139.8)	209.800	(203.7)	0.004
Number of new patients	105.400	(132.0)	11.400	(173.7)	0.006
Number of contraceptive patients	58.250	(120.3)	179.500	(158.0)	0.021
Number of mother and child health patients	5.417	(48.76)	29.110	(80.29)	0.001
Number of observations	596.000				

Note:
The table is a result of Generasi program impact on several dependent variables for Puskesmas characteristics using difference-in-differences. The sample is Puskesmas from each Generasi treatment and control subdistrict. Standard errors clustered at sub-district are reported in parenthesis. *p<0.1, ** p<0.05, *** p <0.01

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