

Macro, Household and Individual Level Explanations for
the Geographic Differences in Poverty Levels in
Indonesia, 2000–2009

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Trinity Term 2017

Thesis submitted for the degree of Doctor of Philosophy

Approximate word count: 70,000

Abstract

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Measuring and explaining poverty and its geographic differences in Indonesia is mostly confined to a single measure of poverty and to macro-level explanations. This thesis moves beyond these constraints to investigate regional poverty trends using multiple measures of poverty and to explore household and individual level explanations. The analyses in the thesis are undertaken using data from the SUSENAS core, covering the period 2000–2009.

Different measures of poverty produce different numbers of poor. Some 33 million additional Indonesians were identified as poor using the \$1.25 a day poverty measure than the official measure used by the government. The differences between both measures of poverty are, however, driven by poverty trends in the early 2000s, following the devastating impact of the 1997–1998 financial crisis. In the latter part of the 2000s, poverty trends were converging between the two poverty measures, suggesting some degree of reliability of Indonesia's official poverty measure.

At the macro level, on average, increasing GDP is significantly associated with falling levels of poverty. The association is reduced marginally when the share of the informal workforce is taken into account, but in general the negative relationship remains robust. Regional analyses, however, reveal that GDP has a very small, insignificant negative association with poverty in the poorest region.

At the individual level, education strongly determines poverty, independently of employment status. A substantial share of the primary and lower secondary qualified population is employed in informal work, yet their risk of poverty is substantially lower when compared to those with no formal qualification engaging as informal workers. More importantly, the highest risk of poverty exists among the unemployed who lack a formal education. This finding is highlighted because unemployment is often seen as having little relevance to poverty, since a higher proportion of the unemployed are tertiary educated. The 'penalty' on poverty for those occupying the lower tiers of educational qualification is heavier in less developed regions.

Household level analysis show that the different groups of female-headed households (*de facto*, widows and divorcees) are less likely to be in poverty than male-headed couple households. After controlling for socioeconomic characteristics and the number of young children within households, however, female-headed divorcee households are found to be marginally poorer than male-headed couple households. Regional level analyses reveal that poverty is significantly higher in female divorcee-led households than in male-headed couple households in all regions, except in the most and least developed ones, where poverty is comparable between both groups.

Acknowledgements

This thesis was completed with the enduring support of many individuals. I'm truly grateful to everyone for making the DPhil journey viable, meaningful and enjoyable.

Uma – my twin and my confidant, was central in guiding me through my DPhil. She quietly supplemented my dwindling bank balance and heroically absorbed my many rants about my research. I sustained my positive energy because of her dedicated support and presence via our almost daily telephone calls.

I am most grateful to Dr Christiaan Monden for his constant and consistent supervision. He steadfastly guided me towards asking the right research questions. He never faltered when it came to questioning my work and firmly getting me through the many deadlines of the DPhil. The thesis did finally come to an end point and this was to a large extent because of his dedicated supervision sessions and encouraging discussions.

I owe a lot to my Papa, Amma, Periana and Chinammah for their endless support and prayers. I thank Ranjini, Sharmilee, Aruna, Dev and Dhanesh for sharing my joys, as well as my sorrows. I can never express enough love and thank you to Sujatha, Sharruna, David, Ahilesh, Ashrita, Pranavhanaathan and Harraskandha for making my world much more beautiful. I enjoyed watching their antics on recorded video clips, as well as going through pictures, drawings and cards that they made and sent me.

I thank Chen Oai Li and Hong Meen Chee for their continuous motivation. My most humble gratitude to Koh Siew Hua, Sinapoo Kandiyah, and Rajasingam Sinnappoo who encouraged me to pursue my postgraduate studies in Oxford. Often I do reflect on where I would be today if it was not for their persistence.

I'm also grateful to Dedi Adhuri Supriadi for the many useful conversations on poverty in Indonesia. I thank Emilie Noteboom, Amoghavarsha Mahadewegowda, Bipana Bantawa, Tania Saeed, Arunvinay Prabakharan, Abhilasha Joshi, Priyamvada Goyal, Florence Graham, Barbara Salas, Alina Istrate, Raheel Dhattiwala and Jane Greig for their tender loving care through the various phases of my data analyses and thesis writing. I sincerely appreciate the very useful advices that I gained from Andrea Canales and Morag Henderson in the first two years of my DPhil.

I thank the sisters of the Society of the Sacred Heart for accepting me to be part of their community at 11 Norham Gardens. My unique achievement in a transient Oxford is that I had the same address through my DPhil journey. This was only possible because the sisters provided a very affordable home for those who walked through their doors.

I would also like to thank my examiners, Professor Francesco Billari and Dr Jeroen Smits for their valuable feedback, encouraging comments and a stress-free viva session.

My most sincere gratitude to Maxis Berhad for making the DPhil journey possible by providing a three year grant. The thesis was completed whilst working as a Research Assistant for the Oxford Poverty and Human Development Initiative (OPHI). I have applied much of the knowledge gained through the work at OPHI in my DPhil research. For that, I am most grateful to my friends and colleagues at OPHI.

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Chapter 1

Introduction

1.1 Overview

An immediate scenario that confronts one observing any of the traffic-congested roads of Jakarta, a metropolitan city of almost 10 million people and the seat of the government of Indonesia, is one of duality. On the one hand, the metropolis is a host to some of the most influential financial firms, government agencies, international development agencies, and hard-to-miss mega-sized shopping malls. On the other hand, co-existing along these dominating physical structures is the sight of thousands of Indonesians making a living from the thriving informal urban economy. Most pedal their tricycles selling street food, while a substantial number of young men hold cardboard signs advertising mechanic or motorcycle-taxi services and scores of children rush to sell water bottles to motorists stranded in the traffic. The government figure shows that on average, between 2000 and 2009, some four percent of Jakartans were living in poverty.¹ Alternative measures of poverty for Jakarta suggest a higher share of poor people. As of 2009, there are 1.6 million people in the metropolitan area with expenditure below 66 percent of the 2009 median, a measure known as the relative poverty. In contrast, the government's official measure of poverty only identifies some 365,000 poor people in the metropolitan area.

Moving on to the eastern tip of the Indonesian archipelago, the province of Papua is home to the world's largest gold mine and the third largest copper mine. It is easy to assume Papua as the land of riches – indeed it does have a regional income above the national average, primarily caused by the extraction of natural resources by private mining companies. Yet, Papua remains the poorest region in Indonesia. Between 2000 and 2009, on average some 40 percent of Papuans were living below the regional poverty line. Moreover, only some 17 percent of Papuans reported receiving income from full-time work, while the majority were either working part-time (45 percent) or were in unpaid household activity (38 percent).

¹ Poverty may be underreported for metropolitan areas because SUSENAS is less likely to capture families living in informal settlements (Baker, 2013). It is not possible to determine by how much poverty is underreported following the limitations in capturing informal settlements constructed on wastelands along the railway tracks, riverbanks and under bridges. This thesis assumes that the numbers are low because informal settlements are comparatively smaller in number when compared to slum households with secure tenure (World Bank, 2016; Burger et al., 2012).

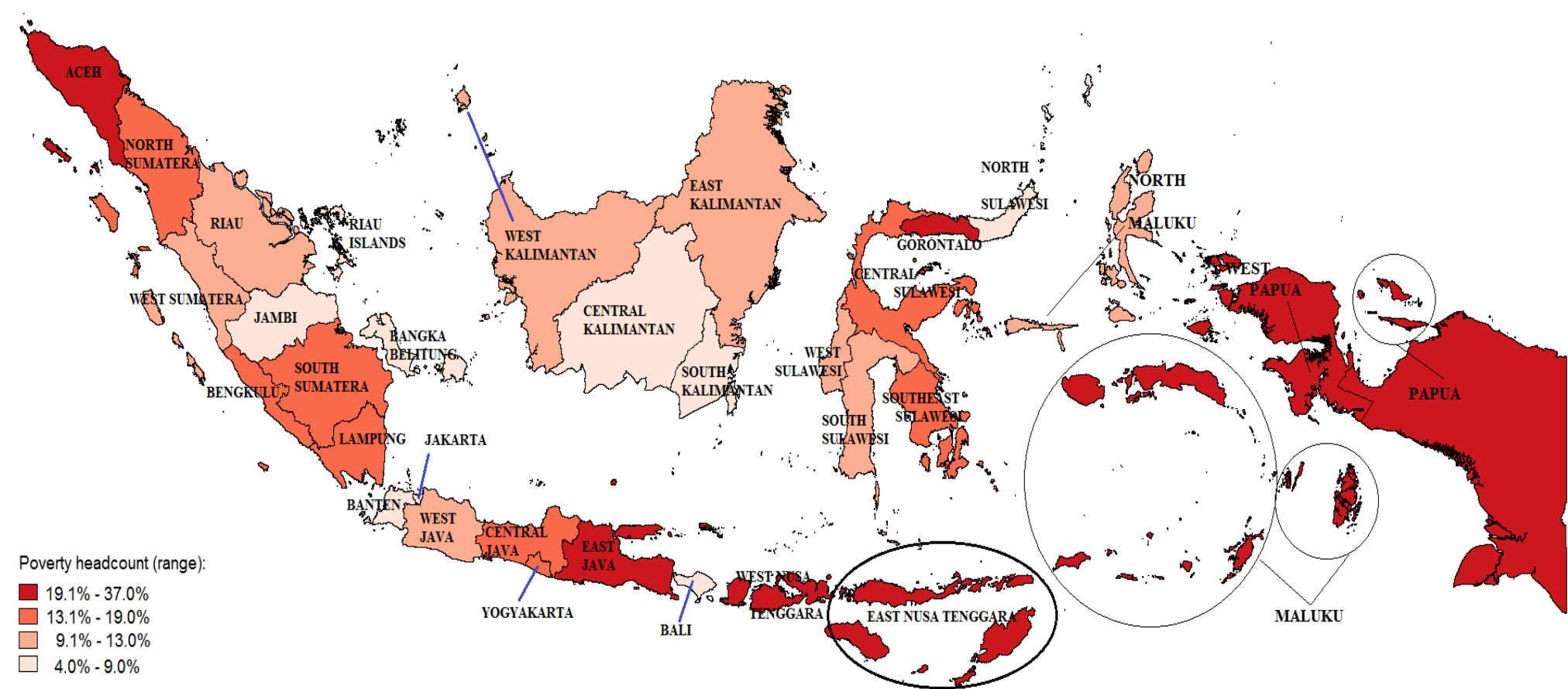
On the same timeline, the country's Central Bureau of Statistics (BPS in its Indonesian acronym) estimated that, on average, some 17 percent of Indonesians were living below the government's regionally defined absolute poverty lines. In other words, some 37.5 million of the 220 million² people living across 33 provinces of the country could not afford to meet their most basic needs. However, the ground reality in Jakarta and Papua shows that national averages often obscure the important variation that is found at the subnational regions (see Figure 1.1). Moreover, an alternative measure of poverty may reveal a subnational trend that is quite divergent from trends based on the government's more conservative measure of poverty, as demonstrated in the case of Jakarta.

It is important to note that the trend of geographic differences in poverty across the Indonesian archipelago has prevailed since pre-independence days. Yet, the subject has received very little scholarly attention, particularly in the field of contemporary quantitative social sciences. An exception to this is the published poverty trend by Islam and Khan (1986) and Bidani and Ravallion (1993). More importantly, there are even fewer studies that explain why such disparity occurs, and among those that do explain, *almost all* have focused exclusively on macro-level explanations (Balisacan, Pernia and Asra, 2003; Suryahadi, Suryadarma and Sumarto, 2009; Miranti, 2010). In particular, one macro-level factor dominates the literature: economic growth.

Empirical findings indicate that regions experiencing slower growth in their economy have fewer people moving out of poverty, while regions with faster growth are associated with more people moving out of poverty (Friedman, 2005). Besides factors related to the economy, others have additionally explored aggregate level measures such as the share of adults who can read and write, the average distance of villages to secondary schools (proxies for level of human capital) and paved roads (proxy for level of development) as explanations for why the share of poor population vary across the archipelago.

² Two-hundred twenty million is the rounded *average* population size between 2000 and 2009. The annual population data are based on the projection data using 2000 and 2010 census data computed and published by BPS, see: <http://demografi.bps.go.id/proyeksi/index.php/dokumentasi/ebook-proyeksi>.

Figure 1.1. Poverty headcount (BPS measure) by province, Indonesia, 2000–2009



Yet, macro-economic factors do not fully explain the differences in the share of poor population between Indonesia's provinces. This suggests that alternative explanations, in particular, factors at the individual and household level, are needed to understand the variation in regional poverty in Indonesia. Indeed the exploration of micro (individual) and meso (household) factors have so far remained elusive in explaining the persisting geographic differences in levels of poverty in Indonesia.

Furthermore, the 1997–1998 economic crisis notably reversed the good fortune of many individuals and families, in particular regarding their engagement with the labour market. Many young men and women lost their jobs in the formal sector, young students were forced to leave schooling behind and families disintegrated into single headships when at least one adult member was forced to migrate to neighbouring cities or countries – with majority of them joining the informal sector for survival. Manning (2010:157) observes that between 1997 and 1999, Indonesians experienced several major changes in the institutional environment, notably in the labour market where formal jobs were displaced.³ Similarly, Suryadarma, Suryahadi and Sumarto (2005) find that an increasing number of Indonesians turned to the informal sector for a source of employment as fewer formal jobs were available and a rising minority opted to remain unemployed as they were discouraged by their employment prospects. It is less clear to what extent these observed changes in the employment trend are associated with the geographic variation in poverty levels in Indonesia.

Following the reasoning above, the overarching objective of this thesis is to understand to what extent the structural factors, identified at the macro (province), micro (individual) and meso (household) levels are linked or associated with employment status⁴ in explaining a) poverty in Indonesia and more importantly b) the geographic differences in poverty in Indonesia. The period that is covered in this thesis is between 2000 and 2009, which represents the post 1997-1998 economic and political crisis period that gripped Indonesians.

³ The period was also marked by other major institutional changes: the first free elections in 1999, decentralisation in 2001, constitutional reform in 2002, the first direct presidential elections in 2004 and elections for district and provincial governments over the subsequent years (Manning, 2010).

⁴ Throughout this thesis, employment status is represented by four major categories: formal employment, informal employment, unemployment and economically inactive.

In the following section, the conceptual framework of this thesis is presented. The section summarises the structural factors that are of interest throughout this thesis. The discussion of the conceptual framework leads to the framing of the overarching research question of this thesis. However, before introducing the specific research questions in detail, an overview of several relevant aspects of this research is covered. This includes an overview of the poverty experiences of Indonesians (third section), the variation in regional poverty levels across Indonesia's major development periods (fourth section), and prior studies on factors that explain the poverty variation (fifth section). Thereafter, the specific research questions of this thesis are framed in the sixth section. The following section covers the data sources used to investigate those research questions. The final section is a summary of the four empirical chapters that supports the objective of this thesis.

1.2 Conceptual framework

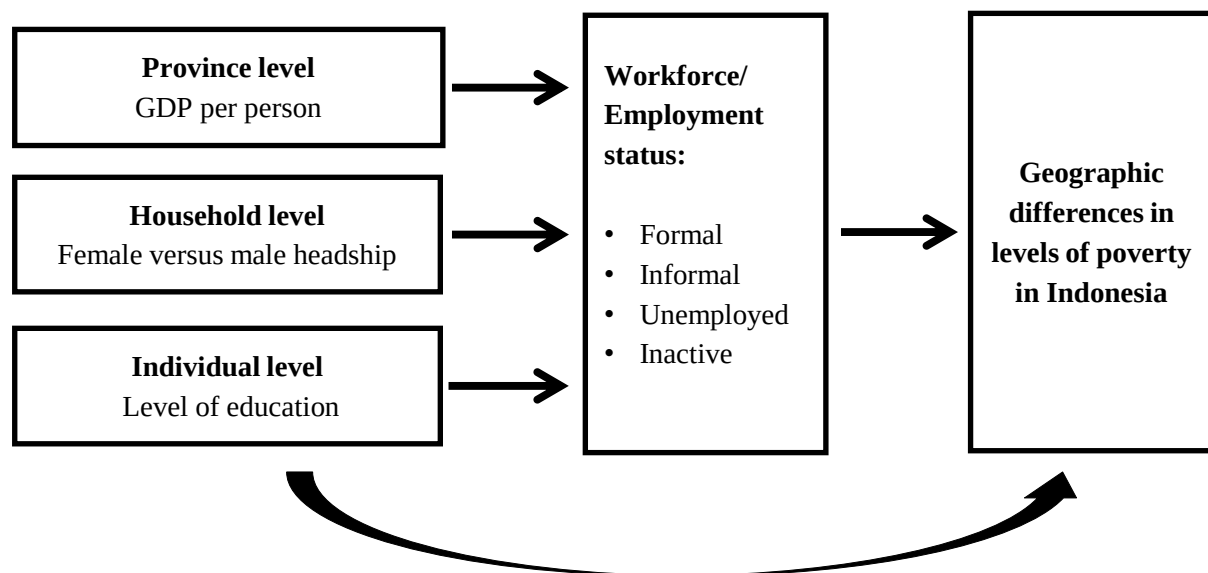
The objective of this thesis is twofold: (1) to compare the geographic trend of poverty in Indonesia based on the official measure, the World Bank's \$1.25 a day measure and a relative measure; and (2) to examine the structural factors that explain the geographic variation of poverty in Indonesia. Figure 1.2 presents the conceptual framework that underpins the structural factors that are of focus in this thesis. However before detailing out the conceptual framework, it is useful to mention briefly the methodology applied to identify poverty. This thesis gives precedence to poverty measured using the official or BPS methodology. Indonesians are identified as poor when their consumption expenditure standards fall short of the BPS poverty line. The line, anchored to the basic needs approach, represents the costs required for Indonesians to meet their absolute minimum needs.

In general, structural factors that explain the geographic variation of poverty across the Indonesian archipelago may be grouped into three levels: macro, meso and micro.⁵ In the context of this study, the macro level is defined at the provincial level, the highest sub-national unit of Indonesia. Most studies employing data at this level have argued that *on average* a growing economy can be expected to help to reduce poverty (Miranti, 2010; Suryahadi et al., 2009; Balisacan et al., 2003). The argument has remained robust even after taking into account of the level of consumption inequality.

⁵No doubt, people's lives (micro) are shaped by their household condition (meso) and regional environment (macro), or vice-versa. Therefore, in Figure 1.2, there should be multiple arrows showing those connections, but this has been excluded. The aim is to present a concise overview of the research focus of this thesis.

However there is one other aspect that is difficult to discern from the empirical analysis of these previous studies. That is, to what extent the economy matters for poverty when the share of informal workforce is prevalent? In particular, despite being a middle- income country, Indonesia's workforce is dominantly engaged in informal employment while only a minority are employed as formal workers. Furthermore, the share of informal workforce varies substantially across provinces from an average of 28 percent in Jakarta to 81 percent in Papua. Thus, the specific research question of interest at the macro level is: To what extent the economy, measured by GDP per person, matters for poverty when informal employment is taken into account?

Figure 1.2. Conceptual framework explaining the variation in poverty between provinces in Indonesia



The next point of interest of this thesis is factors that explain the geographic differences in poverty operating at the meso level. Here meso level is defined at the household level, with particular interest regarding the extent to which poverty co-varies between female headed households with *de facto* and *de jure* status and male headed households. In Indonesia, the documentation on the extent of economic struggle experienced by the different types of female headship based on large scale survey is non-existing. The lack of interest may be driven by previous literatures that suggest no automatic relationship between female headship and poverty (Manning and Sumarto, 2011; Perdana and Maxwell, 2004).

However, these studies have solely treated female headship as an aggregate variable, ignoring the significantly different processes that lead to the formation of female headships (Youssef and Hetler, 1983; Chant, 1997).

For some women, headship is a permanent status, particularly for women whose marital union has dissolved through legal or informal means or the death of their spouse. In other words, these are female heads with *de jure* (permanent) status. On the other hand, for some women the status of headship is temporary: the wife is more likely to take on the *de facto* (temporary) leadership of the household when men migrate for work. Previous findings from elsewhere show that female-headed households with *de jure* status are found to be economically worse off compared to male-headed households, as well as when compared to their *de facto* female counterparts (Chant, 1997). The explanation here is that male-headed households tend to be economically better off because they have more income-generating members, while remittances play a vital role in keeping *de facto* female-headed households in a wealthier position. Qualitative evidence from community studies in Indonesia also show that single mothers and widows are the poorest and they mostly live in the most impoverished regions of Indonesia (Mukherjee, 2002).

However, when it comes to the discussion of poverty, it is also important to single out the position of *de jure* women who are divorced or separated from those who are widowed. This is because single mothers, of whom the majority are divorced or separated from their husbands, tend to be poorer even than widowed female-headed households. Most single mothers bear the dual role of managing a job and caring for their young children. Widowed women, on the other hand, may be better off because they are older and are likely to have adult children whom they could turn to for financial support (Cameron and Clark, 2005).

In general, studies from post industrial countries examining the effect of divorce on women's economic well-being show evidence that women's economic vulnerability increases following their marriage dissolution (Uunk, 2004; Smock, Manning and Gupta, 1999). However, in the context of Indonesia, there is much less work on divorce and poverty. Anecdotal evidence suggests that female divorcees are economically vulnerable because divorce means that many women lose their male breadwinners. A higher proportion of female divorcees also tend to have minimum levels of education. This is not surprising since women with lower levels of education are more likely to marry at an early age and are less likely to

choose their partners – factors that contribute to marital instability – than women with higher levels of education (Heaton, Cammack and Young, 2001). The combination of lack of education and work-related skills places female divorcees in a disadvantaged position in the labour market.

But that still leaves us with the question of whether households headed by female divorcees are economically vulnerable following their lack of human capital and dual responsibility of work and family care. For these reasons, it is crucial to investigate what actually may be occurring among the different types of female headships and how the trend differs across the subnational regions of Indonesia. Hence, at the meso level, this study aims at two research questions. First, do female headships with *de jure* status, particularly among women heads who are divorced, experience a higher risk of poverty than all other types of household? The second question investigates the extent to which the poorer outcome among female-headed households varies across the Indonesian archipelago: Is the risk of poverty higher in households headed by female divorcees in less developed regions when compared to their counterparts living in more developed regions of the country? The questions were explored by taking into account (1) the socioeconomic background of the household head; (2) the human capital contribution of other householders; and (3) the number of young children in the household.

The final empirical interest of this thesis are related to factors that explain poverty at the micro level, that is, at the individual level. The individual factors that are of interest in this study are the level of education and employment status. Previous findings have demonstrated the powerful role of increasing levels of education and reduced risk of poverty (McCulloch, Weisbrod and Timmer, 2007 and UNESCO, 2004). But less is known on the association between the different levels of education and employment status for poverty outcome. It is assumed that in Indonesia the risk of poverty is the highest among individuals who lack formal education and at the same time are employed as informal workers, even more so, than those who are unemployed. The risk worsens for individuals of similar characteristics living in poorer than richer provinces. The argument is that the poor can never afford the cost of staying unemployed (Manning and Sumarto, 2011; Islam, 2006). When they fail to find employment in the formal sector, they are quick to find an alternative in Indonesia's highly flexible informal sector. In addition, previous studies show that unemployment is a trend among tertiary graduates from well-to-do families (Dhanani, Islam and Chowdhury, 2009;

Suryadarma, Suryahadi and Sumarto, 2005). Following these arguments, this study specifically tested the hypothesis that the poorly educated centred in the informal employment bore the highest risk of poverty over any other combination of educational level and employment status; and that their position was worse off over time and in economically poorer than richer provinces.

In this thesis, employment status is seen as an important factor associated with factors operating at the provincial, household and individual level (as shown in Figure 1.2). People's status in the labour market is known to be influenced by multiple factors. These include the stability of the economy, which determines the availability and quality of jobs (Bhagwati and Panagariya, 2013), household demographics, which influence the decision of its members, in particular women, in seeking employment outside of their homes (Gallaway and Bernasek, 2002) and an individual's achievement, such as having the required education and skill for employability (di Gropello, Kruse and Tandon, 2011). Only by taking into account the combined influence of these factors, we will have a better understanding of the factors that explain the geographical variation in poverty in Indonesia.

Furthermore, there has been a notable shift in Indonesia's employment structure in the last decade. This leaves a gap in the literature: to what extent has this shift affected people's economic well-being, specifically their poverty status? In the decade before the economic crisis of 1997–1998, Indonesia was notable for its rapid rates of industrialisation and poverty alleviation. By pursuing a labour intensive and export orientated industrialisation, the government succeeded in creating a spate of new jobs in the garment, footwear, toys and furniture industries. As a result, the urban formal sector's share of total employment almost doubled from its level in 1980 (Manning, 2010).

In addition, construction jobs were in abundance as the government pursued a mass infrastructure development agenda, notably in the construction of roads, hospitals and schools across the archipelago. The expansion of jobs in the formal sector was also associated with increment in wage levels. In particular, the real earnings of those with no formal education and primary qualification grew by 5 and 6 percent respectively, while it grew by 4 percent for those with tertiary qualification (Islam, 2006:345). Although Aswicahyono, Hill and Narjoko (2011:113) note that wage levels were low for those with lower educational qualification, they also concurred that the wages were above those prevailing in agriculture and the

informal sector. More importantly, many Indonesians who qualified with minimum levels of education were absorbed into jobs that are placed within the formal sector and that offered them stable wages.

During the economic and political crisis of 1997–1998, the economy, including the manufacturing industry, contracted sharply as a whole. Manning and Pratomo (2013) point out that in the post-crisis period, growth in casual employment was faster than in regular employment. In part, they explain that this is because of the slow growth in private-sector investment, especially in manufacturing. Following these changes, more Indonesians, in the aftermath of the crisis have become engaged as informal workers. But it is worth noting that informal employment is not only confined to low productivity jobs that are refuge for surplus labour, such as unskilled street vendors. As Manning and Pratomo (2013:169) describes, the sector has diversified to include entrepreneurially-inclined individuals with thriving small businesses and modern service activities engaging self-employed workers. Following the notable shift in the employment trend, it is less clear to what extent provincial GDP (a measure of macroeconomic affluence), people's level of education or the different statuses of women headship are responding to these recent employment structures.

Thus, following the discussion above, the overarching research question of this thesis is *to what extent do provincial, household and individual level determinants operate along with employment structure in explaining poverty outcome in Indonesia? More importantly, do GDP, type of household headship and level of education and their connection with employment status matter for the geographic variation in poverty observed in Indonesia?*

Specific research questions that underline the overarching research question are presented in section 1.6. Before that, it is useful to cover some relevant aspects of this research.

1.2.1 A note on ‘determinants’ referring to association than causation

The word ‘determinants’ seems to suggest causal implications. But in the context of this thesis, ‘determinants’ refer to *associations* of the different factors, operating at different levels of the society with regional poverty. The exploration of causality must be underlined by established theoretical arguments and appropriate identification strategies. For this to happen, one must first explore the potential factors and their associations with regional

poverty trends. In other words, it is useful to make accurate estimates of the associations before advancing to any causal interpretation. However some attempt to go beyond measuring association is made by adopting the random effects (RE) and fixed effects (FE) modelling approach while exploring the research question at the macro level.

1.3 What it means to be poor in Indonesia

Indonesians, by the BPS poverty measure, are recognised as poor when their consumption expenditure falls below the estimated costs of a basic consumption basket. The costs of the consumption basket is calculated based on a person's daily food needs of 2,100 calories, as well as the costs associated with fulfilling non-food needs such as clothing, housing, health and education of the person. In an archipelago such as Indonesia, where markets are not fully integrated spatially, the cost of an individual's basic needs varies by where the person lives (Bidani and Ravallion, 1993: 38). Since prices of goods and services vary across the archipelago, poverty lines are developed by the rural and urban area of each province. The prices are then indexed to the price level in Jakarta, such that the cost of the basic needs is comparable across provinces. In other words, as Miranti (2010) points out, "regional disparities in consumption arise only because of differences in consumption patterns and prices, not because of differences in income levels".

The BPS poverty line methodology has been widely critiqued for its *basicness*. The poverty line, anchored to the basic needs approach, may be defined as a threshold to meet the barest minimum. In other words, Indonesians living below the poverty line is defined as living in abject poverty. An example to illustrate how basic the government's provincial poverty line is to use an alternative poverty line, such as the \$1.25 a day, which is just above the government's modest poverty line. Between the survey years of 2000-2009, some 70.3 million Indonesians or almost one third of the population got by on less than \$1.25 a day, while by the government's measure it was some 37.5 million individuals. If one is to suggest that people should also occasionally afford family dinners in restaurants and be able periodically to go on holidays, then by setting the poverty line at \$1.51 a day, just under half of the population, that is, 102 million Indonesians are not able to meet these rather 'basic' luxuries.⁶ For many Indonesians, the rapid economic and social development since the 1980s has transitioned their standard of living from merely fulfilling basic needs to an increasing

⁶ Provincial poverty figures based on the \$1.25 a day measure is presented and discussed in Chapter 2.

need for essentials, such as students affording private tuitions, youngsters owning computers, farmers having access to modern machineries, to name a few, so they are able to compete in today's intensively competitive market based economy.

Another official indicator of how well the poor are doing is whether their income has improved *relative* to those in the upper parts of the income distribution. The Gini index is one among the many measures of inequality that measures whether the gap between the haves and the have-nots has improved (or deteriorated) over time. The index ranges between 0 and 1, 0 meaning perfect equality with income is shared equally among the population; and 1 meaning perfect inequality, with all income belonging to one person. In Indonesia, the Gini index computed using consumption expenditure data shows an increase in inequality, rising from 0.29 in 2000 to 0.38 in 2010.⁷ Using income data, Leigh and van der Eng (2009) shows that in the early 1990s, the richest 10 percent held some 40 percent of total income while in the early 2000s they accounted for some 35 percent of the total income.⁸ Their work demonstrates that there is a slight decline in the top income shares in Indonesia. However, the media have often critiqued the inequality figures published using data from the national socioeconomic surveys because the mega-rich are less likely to participate in such surveys (Budiantoro and Martha, 2011). In addition, even going by the official figures, the ownership of the economic pie is hugely imbalanced: the income wealth owned by some 200 thousand Indonesians is equal to the income accumulation of more than 200 million Indonesians. In addition, between 2003 and 2010, average real consumption grew by about 4 percent a year (The Economist, 3rd May 2014).⁹ But for the poorest 40 percent of households it grew by only 1.3 percent. In contrast, consumption by the richest 20 percent grew by 5.9 percent. In other words, the rich are getting richer much more rapidly than the poor are.

So far, we have discussed the 'official' measures of poverty and inequality. But what does poverty mean to the poor themselves? In many countries, when queried, poor people go beyond income in defining their experience of poverty.¹⁰ They often include a lack of

⁷ Data on consumption expenditure inequality are based on figures updated by BPS on their website: <https://www.bps.go.id/>

⁸ Data on income shares in Indonesia are based on the computation by Leigh and van der Eng (2009) using SUSENAS Module survey between 1982 and 2004.

⁹ Online source: <http://www.economist.com/news/finance-and-economics/21601550-poor-are-benefiting-relatively-little-indonesias-growth-muted-music>

¹⁰ These dimensions are often captured through focus-group discussions and stakeholder meetings carried out in various communities across the world. Two major reports - the 'Voices of the Poor' (Narayan et.al, 2000) and 'A Million Voices: The World We Want' (UNDG, 2013) - have successfully documented poverty as multidimensional rather than unidimensional.

education, health, housing, clean drinking water, employment, personal security, to name a few. For the poor themselves, no one indicator or single dimension, such as income, is uniquely able to capture the *nature* of poverty (Alkire and Santos, 2014; Stiglitz, Sen and Fitoussi, 2009). The Human Development Index (HDI),¹¹ a multidimensional well-being index that encompasses three major dimensions of life – health, educational and living standards – showed that through the 2000s, Jakarta was consistently categorized as having high human development while islands on the eastern belt of the country, namely Papua, Maluku and Sulawesi, showed low to medium human development.

Evidently, different measures of poverty produce different estimates and pictures of poverty. However, in the context of Indonesia, the government's (or BPS) provincial poverty lines are the primary source of information on the number of poor people. This in turn influences the government's targeted programs for poverty reduction.¹² In other words, economic and welfare policies related to poverty reduction are somewhat guided by those basic provincial poverty lines.

1.4 The persisting gap in regional poverty

Indonesia's annual national poverty figure obscures the large disparity found across its 33 provinces. These provinces are situated on five major islands of the archipelago: Java and Bali; Sumatera; Kalimantan; Sulawesi; and Nusa Tenggara, Maluku and Papua. Java accounts for almost seven percent of the Indonesia land area, the smallest share among all the major islands. Yet, the majority of the population lives on Java: some 57 percent or 140 million Indonesians live and work on this island.

Indonesia's very first census – in 1930 – showed substantial economic disparity between the island of Java and the outer islands (Nitisastro, 1970). While the data lacked poverty information, it showed that the Javanese were better off on average. The densely populated Java island was primarily developed through irrigated agriculture because of its highly fertile

¹¹ Indonesia's HDI is a composite statistic of three indicators: (1) health, as measured by life expectancy at birth; (2) education, as measured by a combination of adult literacy and mean years of schooling; and (3) standard of living, as measured by per person expenditure (PPP Rupiah). The index value is between 0 and 100 and ranks provinces into four tiers of human development: low, medium, high and very high human development. The HDI is recognized as an index that captures both economic and social development, emphasizing that development is not only about economic advances, but also improvements in human well-being.

¹² The three major programs are: (1) the direct cash assistance program (BLT in its Indonesian acronym), which distributed one-time grants of about US \$100 to poor households in 2005 and 2008; (2) Jamkesmas, which provides health insurance to the poor; and (3) Raskin, which provides the poor with subsidized rice. A review of these programs are covered by Alatas, Purnamasari and Wai-Poi (2011).

soil and the abundance of labour. The majority of the Javanese population worked in paddy fields and plantations, while a small minority of the Javanese elites worked as government administrators. On the outer islands, since lands were not fertile, agricultural activities were sparse. The population was mainly dependent on trading. Hence, a fair share of the population led a nomadic lifestyle on these islands.

Income tax data collected in 1939 showed that on the island of Java, the minority of Javanese who paid tax were salary earners, many of them in government services. But in the outer islands, the great majority of the 1.7 million indigenous Indonesians who were forced to pay income tax were self-employed (Booth, 1988:333) suggesting that self-employment was the major form of employment in areas of the country that are the furthest from the country's governing administration. However, a larger proportion of the population in the outer islands, particularly in the island of Maluku were found to be literate. In the island of Maluku, some 20 percent of its population knew how to read and write in comparison to 6 percent on the island of Java (Nitisastro, 1970:82-86). The possible explanation is that trading provided opportunities for locals to write and count for the purpose of keeping accounts, while farmers on the island of Java had less opportunity to do so under the colonial administration.

Since Indonesia's independence in 1949, the eastern part of the country has been persistently identified as economically and socially disadvantaged. In the country's first phase of development (1949–1963) the government emphasised the ideology of 'agricultural-self-sufficiency'. However, irrigation farming and other high value crops were promoted across the island of Java, Sumatera and Bali. Effectively, these islands prospered in terms of food production and were recognised as the green belt of the archipelago.

Through the second phase of development (1964–1996), the majority of the provinces that formed the eastern belt of the country continue to be economically worse off than provinces in the western part of the country, despite the oil price boom between 1970 and 1982 and the rapid industrialisation between 1980 and 1996. The revenues from the oil boom were utilised for infrastructural development projects across the archipelago, suggesting that the government had begun investing in the neglected islands that formed the eastern part of the country. However, the implementation of infrastructural development was slow and of poor quality. For example, roads were built but they were poorly connected between the districts in the eastern region. Bridges and irrigation channels remained incomplete.

Not surprising, the geographic differences in poverty level remained unchanged over the three decades – as shown between the studies of Islam and Khan from mid-1970s and Bidani and Ravallion from early 1990s.

Using nationally representative data from SUSENAS 1976, the islands of Sulawesi, Maluku and East Nusa Tenggara – comprising of seven provinces on the eastern belt of the country – were listed as the ‘problem areas’ in Indonesia (Islam and Khan, 1986:98). In contrast, only three other provinces on the western part of the archipelago were identified as ‘problem areas’. During this period, poverty incidence ranged from 44 percent in East Nusa Tenggara to 3 percent in Jakarta.

In subsequent years, Bidani and Ravallion (1993) constructed a regional poverty profile using data from SUSENAS 1990. The authors notably contributed to a methodological innovation back then, that is, adjusting for the spatial differences in prices across the provinces. Despite the 14-year gap and methodological adjustment to the regional poverty lines, Bidani and Ravallion (1993) list similar findings to those of Islam and Khan (1986). Of the ten poorest provinces in Indonesia in 1990, six of those provinces were located in the eastern part of the country. Poverty incidence ranged from 46 percent in East Nusa Tenggara to one percent in Jakarta. This suggests that despite the impressive record of consistent broad-based economic growth recorded since mid-1980s, the gap in regional levels of poverty persisted.

The third phase is a period that marked the reversal of developmental achievements accomplished under the second phase. Between 1997 and 1999, poverty trends reversed for the worst as the country plunged into a financial crisis. At the peak of its crisis, that is, between mid-1997 and end of 1998, 36 million additional Indonesians were pushed into absolute poverty, although in their work, Suryahadi, Sumarto and Pritchett (2003:221) argue that the sharp rise was only temporary. By mid-1999, following the stabilisation of inflation, poverty decreased to its pre-crisis level. However these findings are limited to a single country-level poverty line (not provincial as was in the earlier decades). In their work, Suryahadi et al., (2003) argued that the computation of regional poverty lines was deterred by highly instable regional food prices. In addition, it may be the case that the riots that followed through the first half of 1999, which eventually brought to an end to Indonesia’s military rule, affected the daily operation of governmental institutions, particularly at the provincial and district level. This, to some extent, may have prevented the monitoring, collection and

recording of reliable data on regional prices which are crucial for the construction of provincial poverty lines.

However, case studies on the poverty experience of Indonesian communities during the economic crisis of 1997 and 1998 reveal that the effects of the crisis were found to be more severe for urban communities on the island of Java and less so for those in the isolated provinces (Mukherjee, 2002: 181-186). In Java, there were massive layoffs from urban industries that closed or went bankrupt during the crisis. Dhanani et al. state that “the layoffs pushed millions of urban workers out of the formal sector into the agricultural sector and the low productivity informal sector” (2009:2). It is not surprising, then, that between 1997 and 1998, the real income of the poorest 25 percent of the population decreased by 64 percent and 33 percent in urban and rural areas, respectively (Smith, Thomas, Frankenberg, Beegle and Teruel, 2002).¹³

The fourth phase of development (2000–2009) is represented by the decade after the economic crisis. The period is characterized by several important institutional changes. These changes include the right of Indonesians to elect their government democratically and the devolution of power to local provincial and district governments. Amidst these achievements, there are areas of concern. Dhanani et al. caution that “more Indonesians than before are self-employed or working for their families without pay and salaried workers are in fact a minority” (2009:22). Economic growth is slower. Poverty reduction is slower. In addition, the poverty disparity across provinces continues to persist. On average, over the 10 years (2000–2009), poverty levels are found to range between 4 percent in Jakarta to 40 percent in Papua. In Papua, some 40 percent of its 3.5 million people, who vastly form the indigenous community of the country, remain the poorest and least developed in Indonesia.

In summary, the substantial gap in poverty levels across the provinces in Indonesia has remained almost stable over Indonesia’s four major development phases. A substantial number of provinces on the eastern belt of the archipelago continue to be disadvantaged by measures of poverty.

¹³ Smith et al.’s (2002) findings were based on data from the Indonesian Family Life Survey (IFLS). The IFLS is a panel data, where households identified in their first wave of the survey in 1993 were followed through in 1997, 2000 and 2008. For their work, Smith et al.’s (2002) have used data from 1993 and 1997. One limitation of the IFLS data is that in 1993 only 50 percent of the provinces in the country were enumerated. The provinces excluded from the survey are on the eastern belt of the country, where the poorest indigenous communities live.

1.5 Explaining the geographic differences in poverty

‘Wulan and her husband, Joko, come from poor families that have always eked out their living in the [informal sector]. They reside in the densely crowded squatter settlement of Tanjungrejo in East Java, where most people work as [scavengers, day labourers, rickshaw drivers and petty traders]. Wulan is the [ninth of thirteen children], only four of whom have lived to adulthood. Wulan [never attended school]. Wulan married Joko when she was 21; she has two children. Joko works as a [becak (three-wheeler) driver]. Whenever Wulan is completely out of money, Wulan pawns her clothes at a government-run pawnshop for Rp 5000 (75 cents) apiece. She [has no assets] and very [few clothes] left’

- Case study of a Javanese household,
Voices of the Poor project, May 1999: 181–182

‘The travelling merchant is our [only source of loan] to buy thread for weaving *ikat* (traditional textile). He also comes to the village to buy our *ikat*. He gives us very [low prices], but we are [forced to sell] to him alone because he provides the cash and thread and because it is [difficult for us to go to the market] to sell our own fabric. The [road is so bad] that [no public transportation] reaches our villages.’

- Women’s group, Waikanabu, East Nusa Tenggara
Voices of the Poor project¹⁴, June 1999: 190

The two case studies depict a similarity: there is some association between being poor and where one lives. But there are distinct *dimensions* of poverty explanation that emerge from each case study. The first case study shows that Wulan and her family live in the province of East Java – a province that is located in the most economically advanced island of Java. In particular, one third of the economy in the province of East Java nowadays is driven by the manufacturing sector, while another one third is driven by sectors related to the tourism industry (that is trade, hotel and restaurant). Despite living in one of the most developed regions of the country, Wulan and her family live in abject poverty. Here, poverty experience is associated closely with disadvantages faced at the individual level such as the lack of secure job and the lack of education, as well as disadvantages at the household level such as large families and the lack of assets.

¹⁴*Voices of the Poor* is a three-part book series that remains an unprecedented project by the World Bank’s Poverty Group that gathered the views, experiences and thoughts of more than 60,000 poor men and women from 60 countries through participatory and qualitative research methods. The first book in the series titled ‘Can Anyone Hear Us’ brings together the voices of over 40,000 poor people from 50 countries from studies conducted throughout the 1990s. The second book in the series, entitled ‘Crying Out for Change’, documents the realities of poverty faced by over 20,000 men and women in 23 countries through comparative field work conducted in 1999. The final book in the series, entitled ‘From Many Lands’, highlights case studies and regional patterns.

The second case study involves a group of women from a village in Waikanabu, situated on the remote province of East Nusa Tenggara. While some 40 percent of East Nusa Tenggara's economy is based on agricultural related activities, the hand-weaving textile sector forms a prominent part of the informal sector. More so, the sector is dominated by women. For many of the women weavers, who mostly work in community groups, weaving remains their major source of income. Despite the meticulous skills required to produce the final product, the returns from the weaving sector is low. Part of this lies in the remoteness of the province thereby leaving prices of goods higher than generally found in the more central regions of the country. In such cases, poverty, as experienced by the people of Waikanabu, is closely associated with factors that are not only operating at the individual level but more importantly at the macro level, such as a lack of physical infrastructure and the absence of fair trade competition.

Several of the factors outlined in the two case studies above are discussed briefly in the following sub-sections, while a comprehensive discussion of the relevant literature is covered in each of the empirical chapters of this thesis. The idea here is to provide a lighter version of the literature on possible explanations of poverty and where possible, the geographical variation in poverty. The aim is also so readers have a context to relate to the specific research questions raised in section 1.6.

1.5.1 Macro economy and poverty

Through an export driven model of economic development, Indonesia achieved high levels of economic growth. More importantly, the trends of high level economic growth were sustained for more than a decade, that is, through the 1980s to mid-1990s. The successful model of economic development is associated with the success of moving close to 70 million Indonesians above the national poverty line in a span of 20 years. Yet, poverty reduction is not uniform within the archipelago: poverty was reduced much more in some provinces while it is slower in others (Friedman, 2005). Previous studies seem to suggest that this has to do with economic growth: in places where economic growth is slower, poverty reduction is slower as well. Regions with a higher share of poverty tend to be places where its economy fails to grow even when the rest of the country is growing. In other words, even when average economic growth is high, parts of a country may be bypassed for decades.

Indonesia's western provinces, linked to foreign trade and investment and where poverty levels are lower, have experienced much faster economic development than the isolated eastern regions of the archipelago, where poverty levels are higher.

There are several factors that prevent the economy of some areas within a country from growing. One argument is the geographical isolation of these areas, which encourages economic isolation. Most areas lacking economic growth are either landlocked, situated in high mountain ranges or lack navigable rivers (Sachs, 2006; Collier, 2007). This geographic disadvantage keeps investors out and transportation costs high. The lack of private investments suggests fewer employment opportunities. Even when investors do set up businesses, they are not large enough to meet local economic needs. Locals then turn towards the informal sector for employment opportunities.

The UN Development Group reported that in Asia, a large majority of the people voiced for greater attention to economic growth that can ensure the generation of employment (2013: 70). The report based on the voices of one million individuals from across the world, including Indonesia, showed that the vast majority of those voices highlighted the issue of persisting inequalities and poverty as being intertwined with poor quality jobs and a pattern of growth which has negatively affected working conditions. In other words, a growing economy that does little in terms of quantity and quality of jobs does little in improving the lives of the poor. On the other hand, while the argument that a fast growing economy would lead to more job opportunities may to some extent be true, they do not necessarily create *favourable* employment opportunities for the poor.

1.5.2 Employment and poverty

For the poor, gainful employment is without a doubt a medium for moving out of poverty. In their randomized control trials among dozens of poor communities in developing countries, Banerjee and Duflo asked parents about their ambitions for their children. The results are striking: the most common dream of the poor is that their children become government employees (2011: 226). The emphasis on government jobs suggests a desire for stability and security.

In 1999, when asked the primary sources of their vulnerability, the majority of urban poor Indonesians mentioned the lack of permanent employment. They further elaborated that the reliance on badly paid and unreliable casual labour and petty trades is the prominent cause of their poverty (Narayan, Chambers, Shah and Petesch, 2000:45). Their thoughts and opinions were heard and documented through May to June 1999, a period characterised by the country's economic and political crisis. In the period after the crisis, employment opportunities have improved and unemployment is below five percent. Yet, the low quality of new jobs is compounding the problem of the working poor. Figures from the Labour Force Survey of 2005 and 2006 illustrate that close to half of working-age Indonesians are engaged in non-permanent contract employment, casual day work and below-subsistence wages (Dhanani et al., 2009).

1.5.3 Level of education and poverty

As outlined in the first case study, Wulan's vulnerability towards poverty is exacerbated as she lacks formal education. This may be the case for some 22 million adult Indonesians who have remained illiterate through the 2000s.¹⁵ In 1999, when enumerators from the *Voices of the Poor* project visited communities in both villages and urban centres of Indonesia, men and women said that every little bit of education helps. As recent as 2013, education was listed as one of the ten development priorities in the MY World survey (UN Development Group, 2013). Specifically in Indonesia, 'the need for a good education' received the highest vote voiced by 16,000 young and old Indonesians. People who can read are more likely to look for job advertisements. They are more willing to take loans to start small businesses. Those who go on to secondary education are more likely to get a formal-sector job than those with primary education (Banerjee and Duflo, 2011; Islam, 2006).

In Indonesia, the primary school enrolment rates are particularly high. After the first oil boom in 1973, the country's then dictator, General Soeharto, decided to build schools in areas where the number of unschooled children was the highest. A nation-wide program was implemented through INPRES (translation: Presidential Instruction). To evaluate whether the top-down supply-driven program was a success, Duflo (2001) compared the wages of adults who as children were young enough to have benefited from the newly constructed schools with the wages of the older generation who would have been just old enough at that time to

¹⁵ The adult illiteracy rate is the percentage of people age 15 years and above who either are not able to read or write a short simple statement about their everyday life.

have missed their chance to go to these schools. The results of this comparison indicate that relative to the older generation, the wages of the younger ones were significantly higher in areas where more schools were constructed. Duflo concludes that every extra year of primary school due to the new school raised wages by about 8 percent.

The incentive to stay in school remains a challenge for a large proportion of the rural and remote population. In the remote eastern provinces of Indonesia, children are more likely to drop out of secondary education when compared to children of same age in urban centres of the island of Java (Suryadarma, Suryahadi, Sumarto and Rogers, 2006). Poverty is also found to be substantially and significantly higher in the eastern areas, relative to other areas of the country (Miranti and Resosudarmo, 2005). This suggests that young people living in high poverty areas of the country are also less likely to complete schooling.

1.5.4 Female headship and poverty

In Indonesia, Mukherjee (2002) finds entrenched gender inequalities at both the community and household levels, affirming that women's lives are doubly insecure than men's lives. Her conclusion was based on participatory discussions and in-depth interviews with more than 900 men, women and youth across 12 communities located in the island of Java and in the islands of West Nusa Tenggara and East Nusa Tenggara of Indonesia.

In general, the empirical evidence that female-headed households have higher risk of poverty than male-headed households is rather mixed. Some have demonstrated that female-headed households are more likely to be poorer (Gangopadhyay and Wardhwa, 2004; Buvinić and Gupta, 1997), while others have shown either weak or contrary evidence (Manning and Sumarto, 2011; Perdana and Maxwell, 2004; Quisumbing, Haddad and Peña, 2001). The ambiguity in findings may partly be explained by the heterogeneity found among female headships (Youssef and Hetler, 1983; Chant, 1997). Women who have lost their spouses through death or separation usually take on the role of the primary decision-maker of the household: that is, the *de jure* headship. On the other hand, women assume temporary headship or *de facto* headship when husbands or partners migrate away from their household for employment on a temporary basis (Jones, 2004; Chant, 1997). Case studies covering urban areas of the Philippines show that *de facto* female headships are less likely to fall into poverty due to the regular remittances sent by their husbands or elder sons working abroad

(Chant, 2008). However, there is also a distinction between the *de jure* female headships: widows and divorcees. The latter is more likely to experience higher levels of economic deprivation for they are usually single mothers, with responsibility for dependent children.

1.6 Research Questions

The overview of poverty experiences and poverty explanations presented in section 1.3 to 1.5 suggests that the subject of poverty research remains highly relevant. The description of hardship faced by Indonesians living below the poverty line, the potentially underestimated size of the poor population by a single measure of poverty, the persisting regional poverty and the under-studied structural explanations of poverty and geographic differences of poverty point towards the need for further research. Following the extended introduction on the focus of this thesis, this section presents the key research questions that are investigated in each of the four following empirical chapters:

- i. Are regional trends of poverty sensitive to the different measures of poverty?
- ii. How does regional poverty respond to GDP *per capita* when the share of informal workforce is taken into account?
- iii. Is the risk of poverty more acute for informal workers lacking education than all other groups? More importantly, are they worst-off in less developed than in developed regions of the country?
- iv. Are households headed by women with *de jure* status, particularly those who are divorced, poorer than all other types of households? More importantly, are they worst-off in less developed than in developed regions of the country?

1.7 Principal data source

Indonesia has several major national surveys. For the purpose of this research, the survey that is of key relevance is the National Socioeconomic Survey of Indonesia (SUSENAS in its Indonesian acronym).

1.7.1 An introduction to SUSENAS

SUSENAS is the only national survey that has comprehensive consumption expenditure data at the household level. Such data is fundamental for the construction of poverty indicators and for the identification of the poor and non-poor within Indonesia. SUSENAS consists of a

set of annual survey questionnaires. Choosing the sub-survey that is most relevant to investigate the research questions raised in this thesis is challenging. The set of annual surveys that make up SUSENAS is summarised in Table 1.1.

Table 1.1. Type of questionnaires that are available under SUSENAS, 2000-2009 (sub-surveys used in this thesis are highlighted)

Year	Month	Questionnaires	Sample enumerated (Households)
2000	January-February	Core only	189,339
	January-February	Core + Module (Sociocultural and Education)	65,664
2001	March	Core only	218,568
	March	Core + Module (Health and Housing)	65,280
2002	February	Core only	212,646
	February	Core + Module (Expenditure and Income)	65,000 +
2003	February	Core only	222,791
	February	Panel: Core + Module (Expenditure and Income) ¹	10,512
	February	Core only	252,913
2004	February	Core + Module (Health and Housing)	67,072
	July	Panel: Core + Module (Expenditure and Income)	10,200
2005	February	Panel: Core + Module (Expenditure and Income)	10,640
	June-July	Core + Module (Expenditure and Income)	68,288
	June-July	Core only	268,848
2006	February	Panel: Core + Module (Expenditure and Income)	10,023
	August	Core + Module (Sociocultural and Education)	68,800
	August	Core only	277,202
2007	February-March	Panel: Core + Module (Expenditure and Income) ²	68,800
	July	Core + Health and Settlement module	68,800
	July	Core only	285,186
2008	March	Panel: Core + Module (Expenditure and Income)	68,800
	July	Core + Module (Expenditure and Income)	66,666
	July	Core only	217,104
2009	March	Panel: Core + Module (Expenditure and Income)	68,800
	July-August	Core + Module (Sociocultural and Education)	291,753

Notes: ¹Panel survey sample is only representative at the national level; ²From 2007 onwards, the number of panel sample was expanded from 10,000 to 68,800 households. The sample is representative at the province level.

The central survey questionnaire is the SUSENAS Core which is administered annually. Effectively, SUSENAS Core is the only survey – among all other national surveys in Indonesia (such as Labour Force Survey) and among other survey components of SUSENAS – with a population sample representative up to the district level. In Indonesia, province represents the highest subnational administrative unit, followed by *kabupaten* and *kota* (collectively identified as district, second level administrative unit), *kecamatan* (sub-district, third level administrative unit) and finally the village level.

SUSENAS Core is also administered in combination with module questionnaire. There are three modules that are fielded in rotation across the survey years. These are: (1) Expenditure and Income; (2) Health and Housing; (3) Sociocultural and Education. The combined core and module questionnaires are administered on a smaller sample that is representative of the population at the province level. The final set of the survey that makes up the SUSENAS composite of surveys is the SUSENAS Consumption and Income Panel. The *panel* survey was introduced in 2003 and follows some 10,000 households that are nationally representative samples. In other words, results drawn from this particular panel survey cannot be inferred as subnational findings. However, since 2007, the sample size was increased and is representative at the province level.

SUSENAS Core is the primary source of poverty and socioeconomic variables used in this thesis. SUSENAS Core + Expenditure and Income Module survey would have been another option – since the sample of this survey is also representative of the provincial population making it viable for the study of spatial poverty. But the combination of the Core and Module survey was less suitable due to its smaller number of observations and fewer rounds of survey. In addition, despite having a smaller sample, the cost of the Core + Module is higher because of the additional detailed variables. Hence a decision was made to focus only on SUSENAS Core as the principal source of data. An exception to this decision is the 2008 survey data. Information on household expenditure was not collected as part of the SUSENAS Core 2008. So data was drawn from the SUSENAS 2008 Expenditure and Income Module instead. As such the sample size for 2008 is much smaller compared to other survey years. However, the weighting of the sample, developed by BPS, allowed for the variables to be comparable to the Core sample.

The total cost in purchasing the SUSEANS Core 2000-2007 and 2009 with selected variables was about GBP 1,500 which was self-funded (Table A.1, Appendix, for Indonesian data invoice). The initial aim of this thesis included Indonesia and Malaysia as focal countries. This was a requirement of the author's scholarship since it was a Malaysian based scholarship. However, due to the exorbitant costs of the Malaysian socioeconomic data, the country was dropped from the study (Table A.2, Appendix, for Malaysian data invoice).

1.7.2 SUSENAS sampling design

In the SUSENAS survey, households were identified for enumeration using a stratified multi-stage cluster sampling technique with two strata (urban and rural area) for each district. At the urban level, a two-stage cluster sampling method is applied. Here households have been divided into census blocks. Each census block is roughly represented by about 100 households. In the first stage sampling, a number of census blocks are selected. In the second stage sampling, 16 households are selected for enumeration from each of the selected census blocks.

In rural areas, a three-stage cluster sampling design is applied. In the first stage, a number of districts are selected. The probability of a district being selected is proportional to the number of households that exists within the district. In the second stage, a number of census blocks are identified from the selected districts. Then from each of the targeted census blocks, 16 households are selected for enumeration – completing the final stage of sampling. At the sampling stages across the urban and rural areas, the census blocks and households within those blocks are selected using linear systematic sampling method.

1.7.3 Variables of interests

The SUSENAS Core has a standardised annual questionnaire that covers basic information about household and individual characteristics including educational attainment, health, employment, fertility and family planning, housing and household expenditure. Many questions have been asked in almost the same way since the SUSENAS was standardised in 1993. As such, it has been possible to pool the data of all years to study a variety of trends.

The key variables of this study are: poverty, employment status, level of education, type of household headship and province. The construction of the poverty variable and re-construction of the employment, education and household headship variables to meet the need of this study is detailed in the relevant empirical chapters. However, it is useful to note the adjustment made to the province variable from onset.

1.7.3.1 Province

One of the main challenges in merging the survey years of 2000-2009 is in dealing with splitting provinces and districts. Indonesia's decentralisation begun in the later part of 1999 and to date is still an on-going process in the country. The process shifted much of the responsibility for local economic development from central government to provincial and district governments (McCulloch and Sjahrir, 2008). The fragmentation of the subnational boundaries resulted in a number of provinces (and districts within those provinces) splitting to form new, smaller provinces (and districts). Between 1999 and 2005, the number of provinces grew from 26 to 33, an additional of seven provinces. At the district level, the decentralisation process was far more dynamic, with 299 districts splitting to form a total of 434 districts in the same timeframe.

Naturally the comparability of poverty between provinces of pre- and post-decentralisation is problematic. The association between poverty and where one lives may be a spurious resulting from splitting provinces. To address this problem, I readjusted the pre-decentralisation boundaries to match the post-decentralisation boundaries. For example, the districts that make up Gorontalo in 2009 are regrouped so as to form Gorontalo from 2000 onwards. The approach is not short of challenges.

The codes and name labels of the lower subnational units tend to differ in the earlier survey years. But this was sorted through communication with BPS staff. In addition, some districts were not part of the earlier sampling framework due to low population size. But in the later survey years, through migration and population growth, these districts qualified under the sampling methodology. However, despite these challenges, this is a better approach than the general practise of collapsing the data back to the 2000 provincial boundaries. The latter is quite misleading since poverty levels are significantly different between the old and newly formed provinces. For example, the decentralisation process in North Sulawesi resulted in the formation of Gorontalo, where average poverty in the former is 10 percent, while the latter is 28 percent.

In summary, for the purpose of this thesis, the boundaries of the seven post-decentralisation provinces were re-adjusted to exist since 2000 (Table 1.2).

Table 1.2. Readjusting the pre-decentralisation boundaries to match the post-decentralisation provincial boundaries in Indonesia using SUSENAS, 2000-2009

Island	Original data		Adjusted data	
	Before splitting	After splitting	For survey years before the split	For survey years after the split
1 Sumatera	South Sumatera	South Sumatera Bangka Belitung	South Sumatera Bangka Belitung	South Sumatera Bangka Belitung
2 Sumatera	Riau	Riau Riau Island	Riau Riau Island	Riau Riau Island
3 Java	West Java	West Java Banten	West Java Banten	West Java Banten
4 Sulawesi	North Sulawesi	North Sulawesi Gorontalo	North Sulawesi Gorontalo	North Sulawesi Gorontalo
5 Sulawesi	South Sulawesi	South Sulawesi West Sulawesi	South Sulawesi West Sulawesi	South Sulawesi West Sulawesi
6 Maluku	Maluku	Maluku North Maluku	Maluku North Maluku	Maluku North Maluku
7 Papua	Papua	Papua West Papua	Papua West Papua	Papua West Papua

It is also useful to note that in particular years, several provinces were excluded from the national surveys due to security concern. In 2000 and 2002, SUSENAS survey was not conducted in the provinces of Aceh, Maluku and Papua due to political and/or communal violence.

1.7.4 Survey timeline

The variables used throughout this thesis were drawn from SUSENAS Core for the survey years of 2000 to 2009. In the initial years, interviews using the SUSENAS Core questionnaire were carried out in the first quarter of the year. However, since 2005, there was a notable shift in the time of the year in which data is collected (see Table 1.1). There are two reasons for why BPS decided to shift the month of survey interview.¹⁶ First, it was increasingly hard to operationalise the surveys during the months of January and February as it is monsoon season.

¹⁶ The following reasons are based on a telephone conversation that was carried out in October 2014 with a relevant statistical officer in BPS in an attempt to find out the reason of why there was a shift in the survey timeline.

Secondly, officers at the provincial and district level were finding it increasingly hard to finance the operation of SUSENAS Core that involved a very large sample at the start of the year. This is because state funds, an important source of funding for the implementation of national surveys, are only disbursed in April. Following these reasons, BPS decided to administer the SUSENAS Core questionnaire between June and July from 2005 onwards.

One may argue that the different timelines of the surveys may pose a potential bias in the comparison of consumption expenditure poverty because the data is sensitive to the seasons of the year. For example, consumption expenditure is more likely to fall during the lean period, that is, during the monsoon season (November–February) and rise in non-monsoon season (April–August). To address this issue, the more recent SUSENAS surveys (particularly since 2011) are conducted every quarterly. As a measure of robustness, I conducted a t-test comparing aggregate consumption expenditure data between two quarters using SUSENAS 2013, specifically the quarters between January–March 2013 and April–June 2013.¹⁷ The consumption pattern was not significantly different between both quarters of 2013. In other words, there is very low likelihood that the change in survey months across the survey years affecting poverty estimates.

1.7.5 Survey limitations

There are two limitations associated with the SUSENAS Core survey. The first has to do with the potential underrepresentation of the vulnerable population. The second is the underreporting of the household consumption expenditure data.

1.7.5.1 Underrepresentation of population that lacks permanent residence

Informal settlements are likely to be under-sampled (Baker, 2013) as families living in these settlements are highly mobile. This suggests that information on poverty among this group of population is likely to be underrepresented. Informal settlements include households in the form of shacks constructed on wastelands along the railway tracks, riverbanks, under bridges and between built up areas. In Indonesia, such illegal squatters are found mostly in metropolitan areas. These illegal squatters – lacking infrastructure, amenities and legal tenure – are associated with very poor living conditions found across Indonesia (Tunas and Peresthu, 2010).

¹⁷ The SUSENAS 2013 data was graciously shared by Perkasa, a local Indonesian NGO that I collaborated with for a project.

It is not possible to determine by how much poverty is underreported following the limitations in capturing informal settlements in Indonesia (Baker, 2013). This thesis assumes that the numbers are low because informal settlements are comparatively smaller in number when compared to slum households with secure tenure (World Bank, 2016; Burger et al., 2012). 8 out of 10 households in Indonesian slums have secure tenure either by owning or renting, while a minority are categorised as illegal squatters (World Bank, 2016). Household with secure tenure means the resident's right to occupy the land is recognised by the local government (World Bank, 2016) and as such SUSENAS enumerates these households (World Bank, 2016; Hiroshige, 2014). This is further attested through data provided by BPS for past and on-going government and multilateral donor funded mega-projects that focuses on upgrading and legalising slums in Indonesia such the Neighbourhood Upgrading and Shelter Sector Project 2004-2009 (ADB, 2003) and the National Slum Upgrading Program 2016-2021 known as KOTAKU (World Bank, 2016).

1.7.5.2 Adjustment to household consumption expenditure data

The data on household consumption expenditure used in this thesis was adjusted to match the consumption expenditure data published from the Module component. To understand this decision, it is useful to note that BPS uses data from SUSENAS Module to construct the provincial poverty lines and poverty rates.

BPS's preference for using Module as its primary poverty data source is because the consumption expenditure data from Module cover a comprehensive list of food and non-food items compared to the Core survey. For example, consumption expenditure data based on Module covers 215 specific food items and 90 specific non-food items while Core covers 15 aggregated food and 6 aggregated non-food items.¹⁸ When the questions are more detailed, respondents are likely to remember in more detail and to report higher spending (World Bank, 2014:18). In contrast, respondents of the Core survey are asked to recall their consumption expenditure based on aggregated categories of food and non-food items. It is thus not surprising that the reported expenditure figures are lower in Core survey compared to Module. In their work, Balisacan et al. (2003) compare expenditure figures between Core and the Module for survey year of 1993, 1996 and 1999. The authors find that expenditure figures from the Core survey are about 11 percent lower, on average than those from the Module.

¹⁸ It makes sense to collect aggregated food and non-food items in SUSENAS Core. The survey is administered on a very large sample hence the questionnaire is kept compact.

Poverty figures will be misleadingly high if BPS poverty lines are applied on what is essentially a ‘low’ consumption expenditure data from the Core survey. Hence, a practical approach was to adjust the household consumption expenditure from Core similar to the mean published from the Module by rural and urban areas of each province, as well as by survey year. This enabled for the application of the BPS provincial poverty lines on adjusted consumption expenditure data. The approach is straightforward, but there is a risk in adjusting data. The adjustment may push some households who genuinely had low expenditure into the higher quintile. However, the differences are more likely to average out, particularly when analyses are presented at the province level. More importantly, the implication of using an unadjusted data, that is, the original expenditure data of SUSENAS Core would have led to greater concerns such as misleading poverty numbers.

One other approach is to re-estimate the provincial poverty lines for each survey year. This may be done by sorting the original household consumption data from the highest to lowest for a given province at a given year. If the official poverty figure (published by BPS) for Jakarta in 2009 is 4 percent, then one may simply take the poverty line at the point where the consumption expenditure value corresponds with 4 percent of the population in Jakarta from the lowest point. The drawback with this approach is that the definition of the poverty line following the basic needs approach becomes invalid. Therefore, in the context of this thesis, it was more relevant to adjust the household consumption data than the poverty line.¹⁹

¹⁹ For the purpose of robustness check, the adjusted poverty line approach was also applied to the Core data. The share of poor people identified at the province level using either adjusted consumption data or adjusted poverty line was very similar. However, in the spirit of maintaining the original definition of the poverty line, this thesis has applied the BPS poverty line on adjusted consumption expenditure data to identify the poor.

1.8 Overview of empirical chapters

The following section provides an overview of the four empirical chapters that forms this thesis.

1.8.1 Chapter 2: Regional poverty trends

This chapter investigates whether the regional trends of poverty are sensitive to the different measures of poverty. Regional poverty trends are analysed by contrasting three poverty measures: the BPS measure, the \$1.25 a day measure and the relative poverty measure at 66 percent of the regional median expenditure. Specifically, three research questions are of focus: (1) Do regional poverty levels and ranking differ by different measures of poverty? More importantly, is there significant mismatch in individuals identified as poor across different poverty measures? (2) How robust is the regional poverty level using poverty measures that are adjusted using various equivalence scales?; and (3) Is poverty consistently higher in the eastern than in the central and western parts of the country using various measures of poverty?

This chapter concludes that different measures of poverty produce different numbers of poor. However there is added value in using multiple measures of poverty only if the measures are defined using a similar approach (such as the case of the BPS and the \$1.25 a day measures – both are anchored to the basic needs approach). For example, the \$1.25 a day measure revealed that some 33 million additional Indonesians in poverty compared to the BPS measure. However, the differences between both BPS and the \$1.25 a day measure is driven by poverty trends in the early 2000s. Given that the \$1.25 a day poverty line represents an average increase of \$0.17 cents from the BPS line, the added knowledge here is that millions of the supposedly non-poor Indonesians by the BPS measure were in fact clustered very closely to the BPS line during a period in which the country was recovering from the devastating impacts of the 1997-1998 financial crisis. Hence, when a slightly higher poverty line is applied, significantly more Indonesians were identified as poor. In the later part of the 2000s, however, poverty trend is converging between both measures of poverty. This chapter also shows that poverty measures anchored to the basic needs approach are more relevant to Indonesian society than poverty measured using a relative approach. Furthermore, this chapter also concludes that in the context of Indonesia, the *per capita* scale is appropriate when inferring individual living standards from household data.

1.8.2 Chapter 3: GDP and poverty: Macro level analysis

This chapter empirically investigates whether GDP per person continues to matter for falling levels of regional poverty in an environment where the share of informal workforce is prevalent. The specific research question of this chapter is: *To what extent the economy, measured by GDP per person, matters for poverty when informal employment is taken into account?*

Using fixed-effects regression on a panel of provinces from 2000 to 2009, the chapter shows that on average, increasing GDP is associated with falling levels of poverty. The size of the association is reduced when the share of informal workforce is taken into account, but these are marginal. A regional analyses show that those living in the poorest region of the country have not benefitted from an increasing GDP. Furthermore, an increasing GDP is associated with much faster reduction in levels of \$1.25 a day poverty than BPS poverty. Since BPS poverty lines are lower than the \$1.25 a day poverty line, the BPS measure is more likely to capture the poorest of the poor. The findings of a much smaller negative association between GDP and BPS poverty suggest that those in the bottom most of the welfare continuum are associated less with an increasing GDP. In other words, a rising tide (GDP) is associated with lifting the boats (poor people) but less so of the neediest boats (poorest of the poor).

1.8.3 Chapter 4: Education and poverty: Individual level analysis

This chapter explores the extent to which the association between individual's level of education and poverty outcome vary in relation to their employment status. Two research questions are of focus: (1) is the risk of poverty more acute for informal workers lacking education?; and (2) do poorly educated informal workers have a much higher risk of poverty in less developed than in better-off regions of the country?

Traditionally, Indonesia's large pool of minimally educated workforce benefitted through formal employment created in the manufacturing and construction industries. However, the economic crisis of 1997–1998 reversed the favourable trends. More Indonesians than before are employed as informal workers. In particular, the increase in informal employment is more notable among those with secondary education. In addition, following the literature, this chapter draws on the assertion that unemployment is less associated with poverty as it is seen as a trend among tertiary graduates from relatively well-to-do families.

This chapter shows that the negative association between an individual's level of education and poverty outcome remains very stable, even when their employment status is taken into account. More importantly, the empirical analyses of this chapter reveals that the unemployed have the highest risk of poverty at any given level of education, and the risk is higher compared to those in informal employment. The finding is a highlight because it is contrary to the unemployment literature in Indonesia. Having employment, even if it is unfavourable form, is likely to keep Indonesians above the poverty line. The conclusion is robust across the major regions of Indonesia.

1.8.4 Chapter 5: Female headship and poverty: Household level analysis

This chapter examines the economic vulnerability of households headed by the different groups of female headships to that of male-headed households. Two research questions are of focus: (1) do female headships with *de jure* status, particularly among women heads who are divorced, experience a higher risk of poverty than all other types of household?; and (2) is the risk of poverty higher in households headed by female divorcees in less developed regions than in better-off regions of the country?

The chapter demonstrates the limitations of looking at the aggregated category of female headship: descriptive numbers revealed that female-headed households are less likely to be in poverty than male-headed couple households, and the former showed a lower poverty than the national average. However, the results showed something different when women-headed households are disaggregated into sound analytical categories. The results indicate that the *de jure* divorcee female-headed households are marginally poorer than male-headed couple households. Regional level analyses confirm that the differences are more pronounced between both groups in places like Sumatera and Sulawesi, where female divorcee group are economically far more vulnerable than the male majority group. It is only in the most developed region (Java) there is some evidence that male-headed households are worse-off than other households. In the poorest region, the probability of poverty is high for all groups of headships regardless whether they are married male, divorced female or widowed women. The chapter concludes that the common argument that female-headed households in Indonesia are economically better off than male-headed households lacks relevance when the different types of female headship are taken into account.

Chapter 2

A Comparison of Indonesia's Regional Poverty Trends Using Multiple Measures of Poverty, 2000-2009

2.1 Introduction

In Indonesia, the poor are defined as those whose consumption expenditure standards fall short of the official poverty line. The poverty line is characteristically a sum of two components: the food line and the non-food line. A defining aspect of the official poverty methodology (also known as the BPS method) is that it corresponds to the most minimal needs, to the extent that the official poverty is comparatively lower than the World Bank's \$1.25 a day poverty measure. For example, in 1996, official poverty in Indonesia stood at 18 percent, whereas it stood at 43 percent using the \$1.25 a day measure.²⁰ The public have protested that the BPS poverty measure fails to reflect rising food prices and falling real wages.²¹ Likewise, academicians continue to criticise the inadequacy of the BPS measure, particularly its definition of the poverty line (Manning, 1998:64).

Despite being contentious, the BPS measure has important value to the Indonesian society in four main respects. First, it helps Indonesians to comprehend just how little some people have to get by in their life. In 2009 some 32.5 million Indonesians were living below the frugal BPS poverty line. Second, despite concerns that the BPS measure underestimates the number of poor, it provides an important benchmark for local politicians to mobilise antipoverty policies for the poorest of the poor and for the public to criticise the delivery of these policies. Third, the BPS poverty line may fail to represent the actual costs of today's living standard, but the methodology does cover a wide breadth of essential food consumption items that are critical for a person's nutritional well-being.

²⁰ Poverty figure for 1996 was obtained from the World Development Indicators database that is published as part of the World Bank's databank: <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators>

²¹ On 15 August 2008, about 3000 people, many of them women and children from the city's burgeoning urban shanty towns organised by the Poor People's Union (Serikat Rakyat Miskin Indonesia [SRMI]), held a protest outside BPS and the Department of Social Affairs in Jakarta. The protesters claimed that the official poverty rate had been manipulated and failed to reflect the increase in hardship experienced by regular people since May 2008, a period also marked by a 30 percent rise in fuel prices (Action in Solidarity with Asia and Pacific, 15 August 2008)

Fourth, although such an unreasonable setting for Indonesia's minimum poverty line seems to suggest some degree of political motivation, it is important to note that the process is a transparent academic exercise that allows for replication and criticism from researchers.

Despite the limitations, this thesis gives precedence to the BPS poverty measure because it is widely accepted by policy makers in Indonesia. It is, however, important to understand how comparable the official measure is to alternative measures of poverty. This chapter compares the findings of geographical poverty differences in Indonesia based on the BPS measure with two other poverty measures: the World Bank's \$1.25 a day measure and the relative poverty measure. A comparison between the BPS measure and the World Bank measure is useful to understand the extent to which BPS measure is defensible if poverty in Indonesia is measured by the standards of the poorest countries in the world. It is useful to mention at the outset that the relative measure is of less relevance to the Indonesian context, and we explore the reasons why this is so in the discussion section. Nevertheless, a poverty comparison between the BPS measure and a relative measure in the context of Indonesia is useful since both measures originate from contrasting yet dominant concepts of poverty.

This chapter focuses on three research questions. The first explores to what extent the different measures of poverty are robust in identifying the poor: *Do regional poverty levels and ranking differ by different measures of poverty?* More importantly, *to what extent is there a mismatch between individuals identified as poor across the different measures of poverty?* The second research question tests the robustness of the different measures of poverty when various equivalence scales are applied: *How robust is the regional poverty level using various equivalence scales?* The final research question explores the regional trend of poverty using different measures of poverty: *Is poverty consistently higher in the eastern than in the central and western parts of the country using various measures of poverty?* These questions are explored using data from SUSENAS Core (National Socioeconomic Survey of Indonesia), 2000–2009.²²

²² An exception to this decision is the 2008 survey data. Information on household expenditure was not collected as part of the SUSENAS Core 2008. So I have drawn data from the SUSENAS Module (Expenditure and Income) 2008. The sample size for 2008 is much smaller compared to other survey years. However the weighting of the sample, developed by BPS, allowed for the variables to be comparable to the core sample.

Previous literature on Indonesia has been limited to analysing regional poverty trends by relying on the BPS methodology (Miranti, 2011; Friedman, 2005). There is an explicit acceptance that the BPS poverty methodology is sufficient for separating the poor from the non-poor. This chapter contributes to the discussion on regional poverty trends in Indonesia by contrasting poverty figures that are measured using the BPS measure, the World Bank's \$1.25 a day measure, and the relative approach. It is useful to consider more than one measure of poverty to better understand the strength and shortfalls of the widely used BPS measure. More importantly, as this chapter proceeds to show, the trends over time and provincial poverty ranking are robust to different measures of poverty that are anchored to the basic needs approach, though precise counts are more sensitive.

2.2 Measuring poverty that are relevant to this thesis

The BPS poverty measure is the primary dependent variable applied in this thesis. In addition, this chapter compares regional poverty trend based on the BPS measure with two other poverty measures: the World Bank's \$1.25 a day measure and the relative poverty measure. Section 2.2.1 – 2.2.4 details the four major steps that were applied in constructing these poverty measures: (1) computing and *adjusting* the total monthly household consumption expenditure; (2) converting household expenditure to per person expenditure; (3) applying relevant poverty lines on per person expenditure data to identify the poor from the non-poor; and finally (4) aggregating information on individual poverty profiles into a summary of poverty statistics.

2.2.1 Indicator of welfare

2.2.1.1 Household consumption expenditure

There is wide consensus that consumption expenditure represents a better welfare indicator than income (Ravallion, 2016; Lanjouw and Ravallion, 1995). This argument is particularly relevant in the context of developing economies, particularly those countries where informal employment prevails. In Indonesia, almost two third of the working force is engaged in the informal labour market. Most jobs in the informal sector are of a seasonal nature, particularly for those engaged in the agricultural and construction sectors, hence wages are more likely to vary.

In reality, however, households tend to mitigate the shortfall in income through several coping mechanisms such as borrowing, using their savings, selling assets or producing their own food. Despite falling income levels, these coping mechanisms help to insulate consumption patterns. In other words, consumption expenditure better captures the consumption smoothing behaviour of households (McCulloch and Baulch, 2000), hence placing it as a more reliable welfare indicator than income.

On the practical side, the data source used in this thesis details expenditure information at the household level in comparison to income. The consumption data from SUSENAS Core is considerably comprehensive in that it includes recall values for consumption from own production and it also includes recall values of non-food items such as utility bills, transport, clothing, education, and housing, to name but a few. In contrast, a single question in the Core questionnaire asks ‘What is the wage/salary (money and goods) usually received for primary work?’ Furthermore, the question is only applicable for those who are employed as employees, representing some 30 percent of the sample. Self-employed and casual workers is excluded from the question, presumably due to the seasonal nature of their income. Thus, in the context of the Indonesian society, household consumption expenditure data is seen as more viable as a welfare indicator than income data.

The household consumption expenditure variable is a sum of food and non-food expenditure. Since the inception of the survey, SUSENAS has used a consistent recall period of one week for all food items (Table B.1, Appendix). The expenditure of the food items recalled in the last week is summed up and later adjusted to an average monthly sum. As for non-food items, the survey has used two recall periods. Household members are asked to recall how much they have spent over the last 12 months and the last month for non-food items (Table B.2, Appendix). However, to derive the total non-food consumption expenditure, BPS relies on the 12-month recall period later adjusted to reflect an average monthly sum. In the Core survey of 2000-2009, the recall was based on some 15 aggregated food items and some six aggregated non-food items.

The total monthly household consumption expenditure, in Indonesian Rupiah, for household h^{th} ($h_1, h_2, \dots, h_n$) in area j (rural/urban) of province p at survey year t is denoted by:

$$\text{Monthly exp}_{hjpt} = \text{Monthly FE}_{hjpt} + \text{Monthly NFE}_{hjpt}$$

where,

$$\text{Monthly FE}_{hjpt} = \text{Total food expenditure in the previous week}_{hjpt} \times \frac{30 \text{ days}}{7 \text{ days}}$$

$$\text{Monthly NFE}_{hjpt} = \frac{\text{Total non food expenditure in the last 12 months}_{hjpt}}{12 \text{ months}}$$

The notations for the expressions are:

Monthly FE_{hjpt} is total monthly food expenditure

Monthly NFE_{hjpt} is total monthly non-food expenditure

2.2.1.2 *Adjusted household consumption expenditure*

The data on household consumption expenditure used in this thesis was adjusted to match the consumption expenditure data published from Module. It is useful to reiterate that the primary source of data used in this thesis is the SUSENAS Core (details covered in Chapter 1, section 1.7.1). It is also useful to note that BPS primarily uses data from the SUSENAS Module to estimate and publish Indonesia's official poverty figures.

The core survey covers a wide-ranging topic, ranging from household consumption expenditure to various demographic information of householders such as education, health, employment, fertility decision, to name but a few. The survey is administered annually on a very large sample, that is, some 200,000 households. The core survey is complemented by a rotating set of specialised modules that are administered on some 25 percent of the households covered by the core sample. BPS's preference for using SUSENAS Module as its primary source of poverty estimation is because the consumption expenditure data from the module survey covers a comprehensive list of food and non-food items compared to the core survey. For example, consumption expenditure data based on Module covers 215 specific

food items and 90 specific non-food items while Core covers 15 aggregated food and 6 aggregated non-food items. The World Bank (2014:18) observes that when the questions are more detailed, respondents are likely to remember in more detail and to report higher spending.

Since the core survey covers a much larger sample size, it is only cost- and time-efficient to collect expenditure information on aggregate consumption, such as on vegetables, than on the quantity consumed and spent on the different *types* of vegetables, as is done by the module component. It is thus not surprising that the reported expenditure figures are lower in core survey compared to module survey.²³ It is misleading to estimate poverty using what is essentially a ‘low’ consumption welfare data, as this will inherently result in high poverty rates.

Hence, a practical approach was to adjust the mean household consumption expenditure data used in this thesis similar to the mean published from the Module for rural and urban areas by province and survey year. As a result, poverty rates estimated using the adjusted data was very similar to the official published figures. The *adjusted* total monthly expenditure for household h^{th} ($h_1, h_2, \dots, h_n$) is expressed as:

$$\text{Adjusted monthly exp}_{h_{jpt}} = \text{Monthly exp}_{h_{jpt}} + \Delta e_{jpt} \quad (2.1)$$

where,

$$\Delta e_{jpt} = e_{1jpt} - e_{2jpt}$$

The notations for the expressions are:

e_{1jpt} is the average monthly consumption expenditure from module survey for area j (rural/urban) of province p at survey year t

e_{2jpt} is the average monthly consumption expenditure from core survey for area j (rural/urban) of province p at survey year t

Δe_{jpt} is the differences in average monthly consumption expenditure between module and core

²³ Balisacan et al. (2003) compare expenditure figures between the core and the module surveys for the year of 1993, 1996 and 1999. The authors find that expenditure figures from the core survey are about 11 percent lower, on average than those from the module survey.

2.2.2 Individual welfare

In measuring poverty, the ultimate goal is to understand *individual* welfare. In this case, we are interested in the consumption expenditure of individual Indonesians. However, information about consumption expenditure that is obtained through national surveys such as SUSENAS are for household units instead of per person units. The literature has proposed various forms of equivalence scales to convert total household expenditure into individual welfare. In Indonesia, as in all developing economies, the common scale that is applied in producing measures of individual welfare is simply to divide aggregate household consumption by household size. By this approach, it is assumed that every member within the household has the same equivalent consumption. The simplicity of the *per capita* approach makes it one of the most accepted method of conversion (Ravallion, 2016). Based on this motivation, the adjusted household expenditure data is transformed to represent a per person measure using the *per capita* approach.

The *adjusted* monthly expenditure (in Indonesian Rupiah) for person i^{th} ($i_1, i_2, \dots, i_n$) living in area j (rural/urban) of province p at survey year t is expressed as follows:

$$\text{Per capita adjusted monthly exp}_{ijpt} = \frac{\text{Adjusted monthly exp}_{hjpt}}{\text{Total members}_{hjpt}} \quad (2.2)$$

However, the simple *per capita* approach has its limitations. Within households, children typically consume less than adults, but a *per capita* approach assumes that all household members consume equally, hence understating welfare in households with a higher fraction of children. This in turn leads to the questionable conclusion that individuals living in larger households are poorer (Deaton and Zaidi, 2002; Lanjouw and Ravallion, 1995). Furthermore, the simple *per capita* approach also ignores the concept of family goods (Lazear and Michael, 1980). Some household goods such as electricity, water, durable items and housing rent are collectively consumed, meaning that households with more members pay less on a *per capita* basis for these items when compared to households with fewer members. Using data from Pakistan, Lanjouw and Ravallion (1995) find that the positive association between poverty and household size disappears when economies of scale in consumption are applied. However, this trend is only observed when the jointly-consumed goods within households (captured in the poverty measure) are *assumed* to be as high as 80 percent – a level that seem unrealistically high.

In the context of developing economies, the way in which the choice of equivalence scale alters poverty comparisons has received very little attention. Very few studies have considered alternatives to the *per capita* scale, such as the new OECD scale, the root square scale or the FAO/WHO scale, all of which adjust for differences in needs by age and gender and/or for economies of scale. A recent study, however, has filled the gap. Using data from 73 countries in Asia and Africa for the year 2000, the study concludes that the application of these various equivalence scales remains inconclusive for the developing economies (Batana, Bussolo and Cockburn, 2013). This is because poverty rates based on the \$1.25 a day poverty line fall to unrealistic levels, such as from 31 percent using *per capita* scale to 3–13 percent depending on the alternative scales used. However, the study does not explain why poverty falls to unrealistic levels with the application of equivalence scales that take into account the differences in needs across age, gender and/or economies of scale in consumption. Ravallion (2016) usefully proposes that in developing economies, shared commodities play little part in the consumption of the poor. Their consumption bundle is dominated by food, for which few scales of economy exist.

Similarly, the traditional notion of joint consumption of family goods such as electricity is misleading in a decade that has seen significant rise in the use of personal communication devices and home appliances (more mobile phones are charged and more clothes ironed in households with more members). A study conducted across two cities in Indonesia (Bandung and Yogyakarta) show that one of the main determinants of differences in household electricity consumption is household size (Wijaya and Tezuka, 2013). Their analyses show that, there is very little scale of economy for electricity consumption as families grow bigger.

This thesis recognises that the choice of equivalence scale in measuring poverty matters because, depending on the choice of scale, some demographic group will be identified as more deprived than others. The widely-used *per capita* scale has been criticised in this respect, as it invariably leads to the conclusion that larger families tend to be poorer as it fails to take into account economies of scale in consumption. On the other hand, in the context of developing economies, the application of various other equivalence scales taking into account the differences in adult and child consumption and family shared goods show unrealistic results (see Batana et al., 2013). The application of these additional scales in regional poverty studies in Indonesia has not, however, been attempted; hence, the sensitivity of the more common *per capita* approach is explored in this chapter.

Following Batana et al., (2013), the specific equivalence scales tested in this chapter are expressed as follows:

OECD scale with weighting of 0.5 for adults, 0.3 for child below 14 years, with no economies of scale ($\alpha_i = 0.5$, $\gamma_c = 0.3$ and $\theta = 1$):

$$N^{eq} = 1 + 0.5 (n_a - 1) + 0.3n_c$$

Square root scale that gives equal weighting to all individuals, with an economies of scale factor of 0.5 ($\alpha_i = \gamma_c = 1$ and $\theta = 0.5$):

$$N^{eq} = (n_a + n_c)^{0.5}$$

FAO/WHO scale that gives weight to each individual's caloric needs based on their age and gender to those of the average household member on which the poverty line is based (y_{ref}). In the case of Indonesia, $y_{ref} = 2,100$ calories since this is the calorie reference used in the regional food poverty line. An economies of scale factor of 0.78 that was derived using data from developing countries is applied here (see Batana et al., 2013):

$$N^{eq} = \left(1 + \frac{\text{caloric needs of adults} + \text{caloric needs of children}}{\text{average caloric needs of a householder, } y_{ref}} \right)^{\theta}$$

The notations for the expressions are:

N^{eq} is the number of average member equivalents in the household, α_i is the discount factor for adult i (excluding the household head), γ_c is the discount factor for child c , n_a is the number of adults (excluding the head), n_c is the number of children, and θ is the economies of scale factor ($\theta = 1$ implying no economies of scale and $\theta = 0$ implying total economies of scale).

2.2.3 Identifying the poor

In section 2.2.1, I discussed why household consumption expenditure is a relevant measure of welfare and outlined the construction of the *adjusted* household consumption expenditure data that will be applied in this thesis. In section 2.2.2, I discussed the strength and limitations of the most common equivalence scale (the *per capita* approach) and showed other alternative scales to convert household level consumption data to individual level information. The next important step is to build an individual poverty profile, that is, to identify the poor from the non-poor. This brings us to the relevance of poverty lines.

Three different sets of poverty lines are focused on in this chapter. First are the BPS provincial poverty lines that are anchored to the basic needs approach. Second is the World Bank's international \$1.25 a day poverty line that is anchored to the average value of the national lines of the 15 poorest countries in the world (at 2005 purchasing power parity exchange rates; all national poverty lines are constructed following the basic needs approach). Third are the relative poverty lines at 66 percent of the median expenditure for a given province.

2.2.3.1 The BPS poverty line

In this section, I outline the BPS poverty line methodology.²⁴ Three important elements characterise the BPS poverty line: (1) the line is computed annually; (2) the line is computed for each rural and urban area by province; (3) the line is the sum of per person per month food and non-food poverty line. The source of data for the poverty line is the consumption and income Module of SUSENAS. In addition, BPS also pre-determines a basket of non-food items based on data from the Basic Needs Commodity Package Survey (SPKKD in its Indonesian acronym) (BPS, 2009).²⁵

²⁴ The provincial poverty lines was made available by BPS upon request.

²⁵ It is beyond the scope of this thesis to recompute the provincial poverty lines as a measure of validation of the data that was produced by BPS. This is because any project to replicate the work of BPS would require purchasing additional or complimentary data such as the Module survey, the SPKKD and calorie data from the Ministry of Health. This was financially not feasible.

The BPS poverty line represents the minimum monthly cost that is required to meet a person's food and non-food needs. The food expenditure is anchored to the cost spent on 52 food items that corresponds to 2,100 calories per person per day, complemented by the cost to purchase a pre-determined basket of 26 non-food items for rural and 27 items for urban.²⁶ The total cost for the food and non-food basket is derived using the expenditure data of a reference population, specifically the 20 percent of the population who are just above the previous year's poverty line for each urban and rural area by province (BPS, 2009). The BPS poverty line for area j (rural/urban) of province p at survey year t is given as:

$$\text{BPS_PL}_{jpt} = \text{BPS_food_PL}_{jpt} + \text{BPS_non_food_PL}_{jpt}$$

The notations for the expressions are:

BPS_food_PL is food poverty line

BPS_non_food_PL is non-food poverty line

The **food line** for area j (rural/urban) of province p at survey year t is expressed as follows (BPS, 2009):

$$\text{BPS_food_PL}_{jpt} = \frac{\sum F_{jpt}}{\sum K_{jpt}} \times 2,100 \text{ calorie}$$

where,

$$\sum F_{jpt} = \sum_{k=1}^{52} P_{kjpt} \times Q_{kjpt}$$

The notations for the expressions are:

P_{kjpt} = price of each commodity k in area j (rural/urban) in province p at survey year t

Q_{kjpt} = average quantity of each commodity k that is consumed

F_{jpt} = total expenditure for 52 commodities

K_{jpt} = total calorie for 52 commodities²⁷

²⁶ In 1999, BPS announced that it was revising the poverty line methodology. Among the changes implemented, BPS switched the composition of its food and non-food basket to more expensive items (Priebe, 2014). These food and non-food items have remained unchanged through the 2000s which was favourable for this thesis for consistency purpose.

²⁷ The information on total food consumed is converted into calories. This step is carried out by BPS using data published by the Ministry of Health.

The **non-food** line for area j (rural/urban) of province p at survey year t is expressed as follows (BPS, 2009):

$$BPS_non_food_PL_{jpt} = \sum_{k=1}^n r_{kjpt} \times NF_{kjpt}$$

The notations for the expressions are:

NF_{kjpt} = total expenditure for a pre-specified basket of non-food commodity k

r_{kjpt} = expenditure ratio for non-food commodity k

The expenditure ratio for non-food commodity is estimated using data from SPKKD. Complementary information from SPKKD is used because compared with SUSENAS, the SPKKD includes more detailed questions on non-food consumption (Priebe, 2014). For example, let us assume that the expenditure on mobile phone bill payment/recharge constitutes 70 percent off all telecommunication expenditures of the reference group as recorded in the SPKKD. Data from the Module, on the other hand, showed that the reference population spends Indonesian Rupiah (Rp) 70,000 on telecommunications each month. BPS then applies the ratio: $0.7 \times \text{Rp } 70,000 = \text{Rp } 49,000$ which is the amount that is entered for mobile phone bill payment/recharge commodity.

Since the food and non-food poverty lines are computed for rural and urban areas by province, this means the commodity prices are sensitive to local prices. This is an important consideration in Indonesia since it is an archipelagic nation where the markets are not fully integrated and inter-regional transport costs are high. As a result, the cost of an individual's basic needs basket varies by where they live (Bidani and Ravallion, 1993). The prices are then indexed to the price level in Jakarta, such that the cost of the basic needs is comparable across provinces. In other words, regional disparities in consumption arise only because of differences in consumption patterns and prices, and not because of differences in income levels (Miranti, 2010).

In sum, the BPS measure identifies a person as poor if the *adjusted* monthly consumption expenditure (in Indonesian Rupiah) of person i^{th} ($i_1, i_2, \dots, i_n$) is below the BPS poverty line for area j (rural/urban) in province p at survey year t :

$$\text{Per capita } \textit{adjusted} \text{ monthly exp}_{ijpt} < \text{BPS_PL}_{jpt} \quad (2.3.1)$$

2.2.3.2 The World Bank's \$1.25 a day poverty line

The World Bank's \$1.25 a day poverty line at 2005 purchasing power parity (PPP) is also essentially a basic needs line. The \$1.25 a day line represents the minimum cost that is required to meet the basic daily needs of a person following the national poverty standards of the poorest 15 countries in the world at 2005 PPP exchange rates (Ravallion, Chen and Sangraula, 2009; World Bank, 2017).²⁸ This chapter is motivated to compare Indonesia's regional poverty profile between the BPS measure and the World Bank measure to understand to which extent the official measure is defensible if poverty in Indonesia is measured by the standards of the poorest countries in the world.

The technical procedure that was applied in constructing the \$1.25 a day line is discussed in Ravallion et al., (2009).^{29 30} The technical details of the World Bank's poverty line are not discussed here because of more relevance to this chapter is the approach applied in converting the monthly consumption expenditure data valued in Indonesian Rupiah (Equation 2.2) to a per day data valued in U.S dollar. Adjusting the data to per day value is essential since the World Bank's poverty line represents a daily benchmark.

²⁸ The 15 countries are Malawi, Mali, Ethiopia, Sierra Leone, Niger, Uganda, Gambia, Rwanda, Guinea-Bissau, Tanzania, Tajikistan, Mozambique, Chad, Nepal and Ghana.

²⁹ The national poverty lines of 88 developing economies, including 25 of the poorest countries in Sub-Saharan Africa was compiled and reviewed. In the following step, the national lines of each country were converted to a common currency by using the 2005 PPP exchange rates. This step produced reliable conversion for 75 of the 88 national poverty lines. The PPP exchange rates allows for poverty in all countries to be measured by the same standard. The nonparametric regression provided a reasonable good fit for the average national poverty lines of 15 of the poorest countries (at 2005 PPP). This formed the basis for the \$1.25 a day line.

³⁰ In 2015, the new international poverty line was set at \$1.90 a day when the PPPs were updated using 2011 prices (Ravallion, 2016). In other words, the real value of \$1.90 in 2011 prices is the same as \$1.25 was in 2005.

The *adjusted* daily expenditure (in Indonesian Rupiah) for i^{th} person living in area j (rural/urban) in province p at survey year t is expressed as:

$$\text{Per capita } \textit{adjusted} \text{ daily exp}_{ijpt} = \frac{\text{Per capita } \textit{adjusted} \text{ monthly exp}_{ijpt}}{30 \text{ days}}$$

The next step focused on converting the data valued in Indonesian Rupiah to U.S dollar. An additional adjustment is applied to allow for the fact that the purchasing power across the Indonesian archipelago is different. In the BPS poverty measure, the regional variation was accounted for in the BPS provincial poverty lines. In the context of the World Bank's poverty measure, the adjustment for regional variation is applied on the welfare indicator (that is, on the consumption expenditure data) instead of the poverty line.

It is important to keep in mind that the annual PPP conversion factor computed by the World Bank is essentially a national estimate.³¹ This allows for poverty in Indonesia to be comparable to the standards of poverty in other countries. But there is important regional variation in the prices of goods and services across the archipelago. Thus it was necessary to construct a spatial cost-of-living differences using provincial urban-rural adjustment factors. This was derived from the relative differences between the national and provincial poverty lines (following the work of Ilmma and Wai-Poi, 2014). Applying this adjustment will inform us how poverty in rural and urban areas of each province, e.g.: rural Bali is comparable to the standards of the poorest countries in the world. The adjusted national PPP conversion factor by area j (rural/urban) and province p at survey year t is expressed as follows:

$$\text{Adjusted_PPP_factor}_{jpt} = \text{National_PPP_factor}_t \times \frac{\text{BPS_PL}_{jpt}}{\text{BPS_national_PL}_t}$$

The notations for the expressions are:

$\text{National_PPP_factor}_t$ = PPP conversion factor (at 2005 prices) for Indonesia at survey year t

BPS_PL_{jpt} = poverty line for area j (rural/urban) of province p at survey year t

BPS_national_PL_t = national poverty line for area j (rural/urban) of survey year t

³¹The annual conversion factor for Indonesia is computed and made available by the World Bank on their website: <http://databank.worldbank.org/data/reports.aspx?source=2&country=IDN#>

The adjusted PPP conversion factor allowed for converting the per capita *adjusted* daily consumption expenditure data into U.S dollars, for person i^{th} ($i_1, i_2, \dots, i_n$) living in area j (rural/urban) in province p at survey year t as follows:

$$\text{Per capita } \textit{adjusted} \text{ daily exp in U.S dollar}_{ijpt} = \frac{\text{Per capita } \textit{adjusted} \text{ daily exp}_{ijpt}}{\text{Adjusted_PPP_factor}_{jpt}}$$

In sum, the World Bank measure identifies a person as poor if the *adjusted* daily consumption expenditure (expressed in U.S dollar) of person i^{th} ($i_1, i_2, \dots, i_n$), living in area j (rural/urban) in province p at survey year t is below the \$1.25 a day poverty line:

$$\text{Per capita } \textit{adjusted} \text{ daily exp in U.S dollar}_{ijpt} < \$1.25 \text{ a day} \quad (2.3.2)$$

2.2.3.3 The relative poverty line

A relative approach suggest that individuals are in poverty if their income and resources are so inadequate as to preclude them from having a standard of living considered acceptable in the society in which they live (Lister, 2004). Here the poverty line varies based on the distribution of household's real consumption or income. One of the disadvantages of a relative poverty line is that if average income declines for the majority of the population, the relative poverty rate will not change much even though those in the bottom are getting poorer. This is because the relative poverty line will adjust according to the current average income.

The shift in the poverty benchmark poses a problem in informing poverty reduction policies, particularly in a country where abject poverty is still a serious concern. For the purpose of informing poverty reduction policies, a poverty line should always be absolute in the space of welfare (Ravallion, 2016). Such a poverty line guarantees that the poverty comparisons made are consistent.

Warr (2005) argues that a relative poverty line is in effect a measure of inequality. Assuming that the real expenditures of all households in Indonesia doubles, then relative poverty (or inequality) would not change, but absolute poverty would decline substantially. In sum, when the overall size of the economic pie changes significantly, measures of absolute and relative

poverty do not necessarily move together, and may not even change in the same direction. This suggests, in the context of emerging economies, where there is the need to understand whether the overall size of the economic pie helps reduce poverty, that an absolute poverty line is more apt. A relative poverty line where the line rises with average income is argued to be more suited to high- and middle-income countries where absolute deprivation has been dealt with (Atkinson and Bourguignon, 2001). Indonesia gives a contrasting picture: it is recognised as a middle-income country by its GDP measure, but absolute poverty is still a persisting problem. Despite this, we pursue with the construction of a relative poverty line for the purposes of comparison.

Individuals are identified as living in relative poverty if his or her *adjusted* monthly expenditure is below 66 percent of the median *adjusted* monthly expenditure for a given province and survey year. The choice of 66 percent as the median cut-off is based on the reasoning that the average national poverty based on this particular threshold corresponds to average national poverty identified using the BPS poverty line. To some extent the choice of the 66 percent median line may seem arbitrary, but it allows for a simple comparison between the two dominant poverty line methodologies – the basic needs versus a relative measure.³²

The relative poverty line for province p at survey year t is expressed as follows:

$$\text{Relative_PL}_{pt} = 0.66 \times \text{median (aggregated per capita } \textit{adjusted} \text{ monthly expenditure)}_{pt}$$

In sum, the relative poverty measure applied in this chapter identifies a person as relatively poor if the *adjusted* monthly consumption expenditure (in Indonesian Rupiah) of person i^{th} ($i_1, i_2, \dots, i_n$) is below the relative poverty line for province p at survey year t :

$$\text{Per capita } \textit{adjusted} \text{ monthly exp}_{ijpt} < \text{Relative_PL}_{pt} \quad (2.3.3)$$

³² A dominance analysis for various relative poverty cut-offs of 60, 65, 66, 67, 68, 69 and 70 percent of median expenditure aggregated by different geographic compositions such as rural and urban by province and national show that provincial trend and ranking is mostly stable.

2.2.4 Poverty headcount

The final step in measuring poverty involves aggregating information on individual poverty profiles into a summary of poverty statistics. In practice, the most common measure of poverty aggregation is the poverty headcount: that is, the share of poor in a given population. The strength of this particular measure is that it is intuitively simple to interpret. The simplicity of this measure often makes it a powerful headline figure in reporting the prevalence of poverty of a nation, as well as for regional comparisons. In other words, the poverty headcount for a given individual poverty profile is:

$$H_{ip} = \frac{q_p}{n_p}$$

where,

q_p is the number of poor people in province p

n_p is the total population of province p .

In the context of this chapter, q_p is estimated based on three different poverty lines: the BPS line (Equation 2.3.1), the World Bank's \$1.25 a day line (Equation 2.3.2) and the relative poverty line (Equation 2.3.3).

Although commonly used, poverty headcount measure is insensitive to any changes of those below the poverty line. If a poor person experiences a drop in their economic welfare, making them poorer, then realistically the poverty measure must increase (Sen, 1976). Since poverty headcount is of restricted value to those below the poverty line, it is usually complemented by the squared poverty gap measure which gives additional weight to those further below the poverty line (Foster, Greer and Thorbecke, 1984). However, this particular class of measure is not explored in the context of this thesis. Understanding the progress (or constraints) of the poorest of the poor merits an independent study. It is of little use to explore the measure descriptively and not aim for explanations.

However, the narrow focus of poverty headcount has its merits. First, readers get an intuition of how regional poverty in Indonesia vary by the different measures of poverty that are constructed using different poverty lines. Next, readers can tell how close Indonesians are clustered just above the official BPS line when it is compared to the \$1.25 a day line. This is because the \$1.25/day line represents an average increase of \$0.17 cents from the BPS line,

and both lines are constructed using the basic needs approach. In addition, a focus on poverty headcount allows us to ascertain if the ranking from the poorest to the least poor province is stable using different measures of poverty. Previous work focusing on Indonesia has shown that poverty incidence is significantly different in the eastern and western provinces (Miranti and Resosudarmo, 2005), but the finding is limited to a single poverty measure: the BPS measure.

Moreover, a poverty headcount using different measures of poverty estimated from the same data source provides an in-depth understanding on the subject of poverty mismatch. An example of this work is by Whelan, Layte and Maître (2004). Using five waves of the European Community Household Panel (ECHP) data from nine western European countries, the authors show that some 10 percent of individuals are persistently income-poor and deprived. At the same time, they also find that 10 percent of the population is only persistently income-poor, while another 9 percent is persistently deprivation-poor. If poverty is measured using both measures of poverty, then we may conclude that almost one third of the population in those nine western European countries face either one form of poverty, or both in combination. However, if only a single measure of poverty is used to influence the design and distribution of welfare policies, then a substantial proportion of the population would have been excluded from any form of intervention.

2.3 Results

2.3.1 Do regional poverty levels and rankings differ using different measures of poverty?

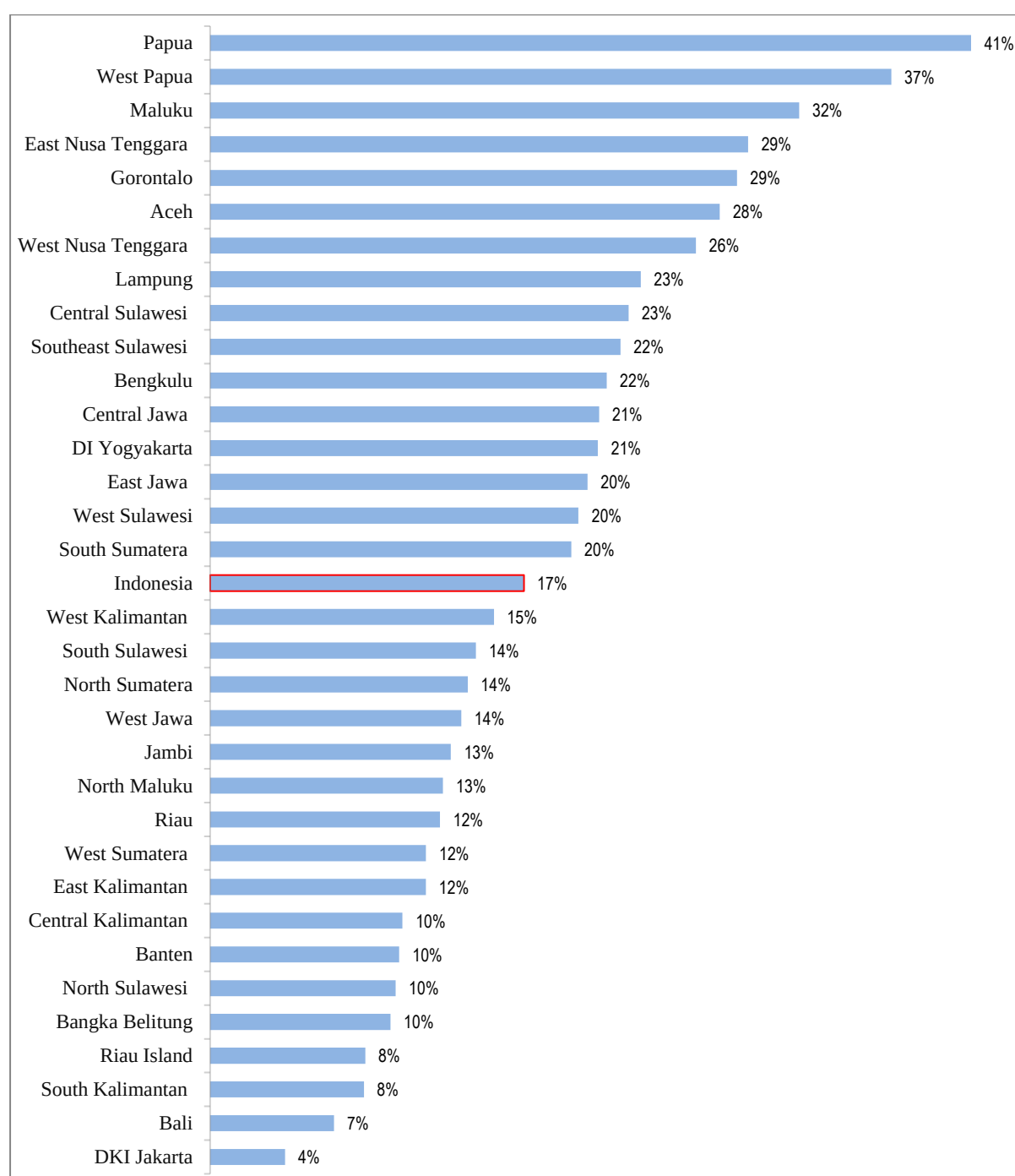
2.3.1.1 Poverty based on the BPS measure

The results illustrated in Figure 2.1 (blue bar) suggest two key points. First, the application of the BPS measure reveals that there is substantial variation in poverty level between provinces. Poverty for the year of study is as low as 4 percent in Jakarta and as high as 41 percent in Papua. The national average indicates that some 17 percent, or some 37.4 million, of Indonesians were identified as poor by the BPS measure.

Second, poverty is more prevalent among provinces in the eastern areas of the country than in other areas. Of the 16 provinces recording higher average levels of poverty than the national average (which is represented by the bar labelled 'Indonesia' in Figure 2.1), nine are located on the eastern islands of Nusa Tenggara, Maluku, Papua and Sulawesi. Moreover, poverty is more than twice as high as the national average in the provinces of West Papua and Papua, located in the easternmost tip of Indonesia. Comparatively, only three provinces in the central region (Central Java, Yogyakarta and East Java) and four provinces in the western region (Aceh, Lampung, Bengkulu and South Sumatera) have recorded higher poverty than the national average.

It is nevertheless useful to remember that the eastern areas of the archipelago are sparsely populated compared with the more central and western provinces. For example, some 5.4 million poor people live in the nine poorest provinces located in the eastern area of the archipelago. In contrast, the three poorest provinces in the central region of the island of Java together account for some 14.8 million poor people. In Indonesia, the poverty figure is often stated in terms of a percentage of the total population. The absolute number of people in poverty should be highlighted as well given that some provinces are much more populated than others.

Figure 2.1. Poverty (%) by province using the BPS measure, 2000–2009, Indonesia



Note: Data is sorted from highest to lowest level of poverty.

2.3.1.2 Comparing poverty based on the BPS measure versus the World Bank's \$1.25/day measure

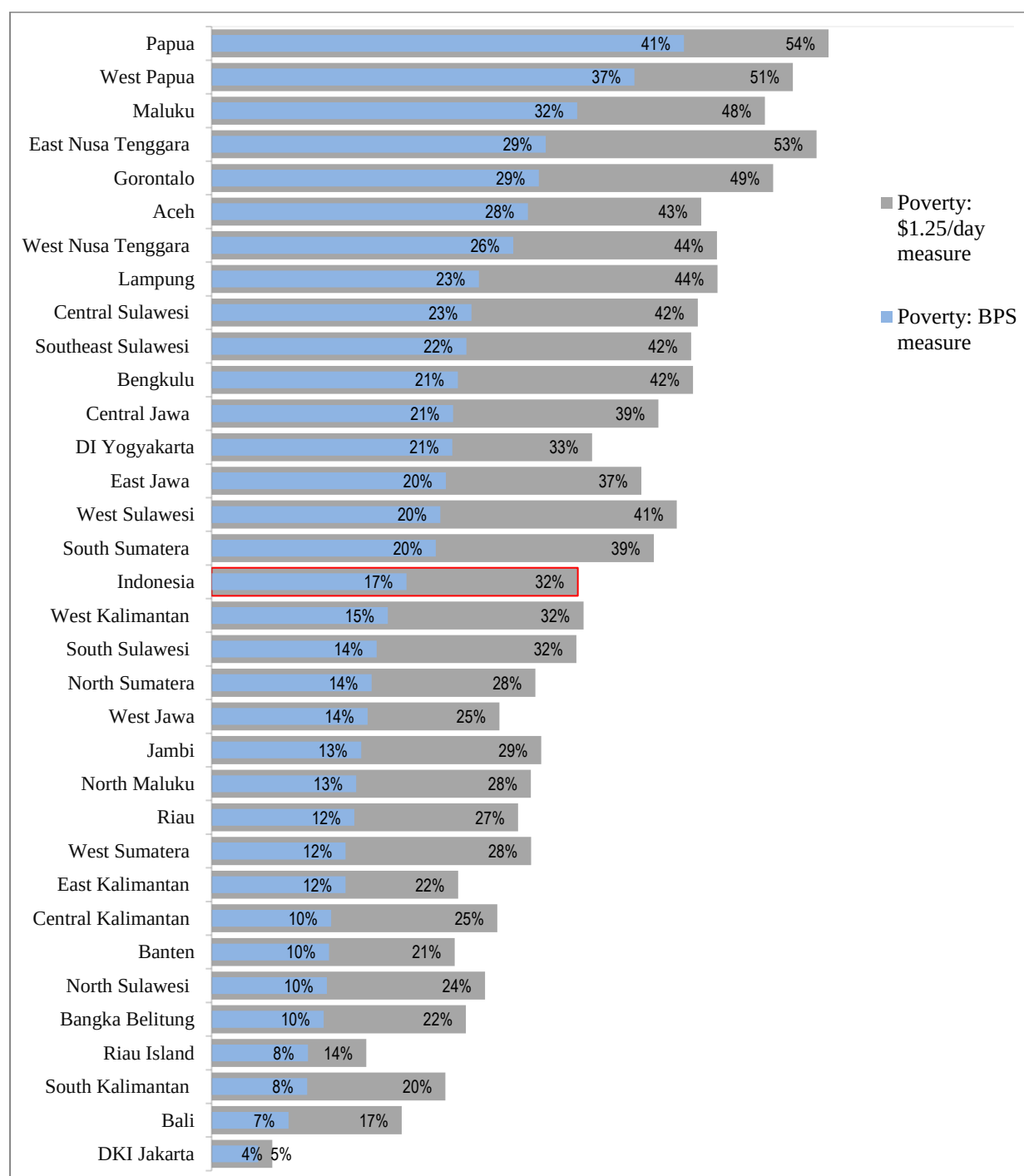
But is the BPS poverty measure underestimated, as argued by its critics? An alternative poverty measure, that is, the \$1.25 a day measure, is used for comparison. In other words, this section explores the extent the official measure is defensible if poverty in Indonesia is measured by the standards of the poorest 15 countries in the world. Figure 2.2 shows that on average, some 32 percent or 70.4 million Indonesians are living below \$1.25 a day (represented by the grey bar labelled 'Indonesia').

In contrast, only some 17 percent or 37.4 million Indonesians are identified as poor by the BPS measure (represented by the blue bar). In other words, the average share of poor almost doubles: that is, an additional 33 million Indonesians are identified as poor by applying the \$1.25 a day poverty line instead of the BPS line. The increase is not surprising as the average value of the BPS regional poverty line, expressed in international currency using 2005 purchasing power parity, translates to \$1.08, ranging from a minimum average of \$1.02 a day in East Nusa Tenggara to a maximum average of \$1.27 a day in Jakarta (Table B.3, Appendix).

This suggests that the average national poverty lines of the poorest 15 countries in the world is \$0.17 cents higher than the average BPS provincial poverty lines.³³ But what is interesting is that an average \$0.17 cents increase in the allowance of the regional poverty lines is associated with a substantial rise in poverty. This suggest that a significant share of the population is clustered just above the BPS poverty lines; hence, a slight increase in the allowance of the poverty lines result in a lot more people being identified as poor.

³³ (\$1.25 a day [World Bank poverty line]) – (\$1.08 a day [BPS per day poverty line, averaged across provinces and survey years]) = \$0.17 cents. Please refer to Table B.3, Appendix for the computational steps that were applied to obtain the BPS line that was valued in U.S dollar.

Figure 2.2. A comparison of poverty using the BPS measure and the \$1.25 a day (2005 PPP) measure, by province, 2000–2009, Indonesia



Note: Data is sorted from highest to lowest level by official poverty.

Moreover, while *almost all* provinces show more than a 10 percent jump in the share of poor people living below \$1.25 a day compared with the BPS measure, Jakarta is the exception. Poverty in Jakarta is 4 percent using the BPS measure and 5 percent using the \$1.25 a day measure. A closer look in Jakarta reveals that poverty increases more than twofold, from 5 percent using \$1.25 a day measure to 12 percent using \$1.51 a day measure. The latter is the poverty line recommended by the Asian Development Bank (ADB) as being a more accurate representation of the cost of living in Indonesia than the \$1.25 a day poverty line.

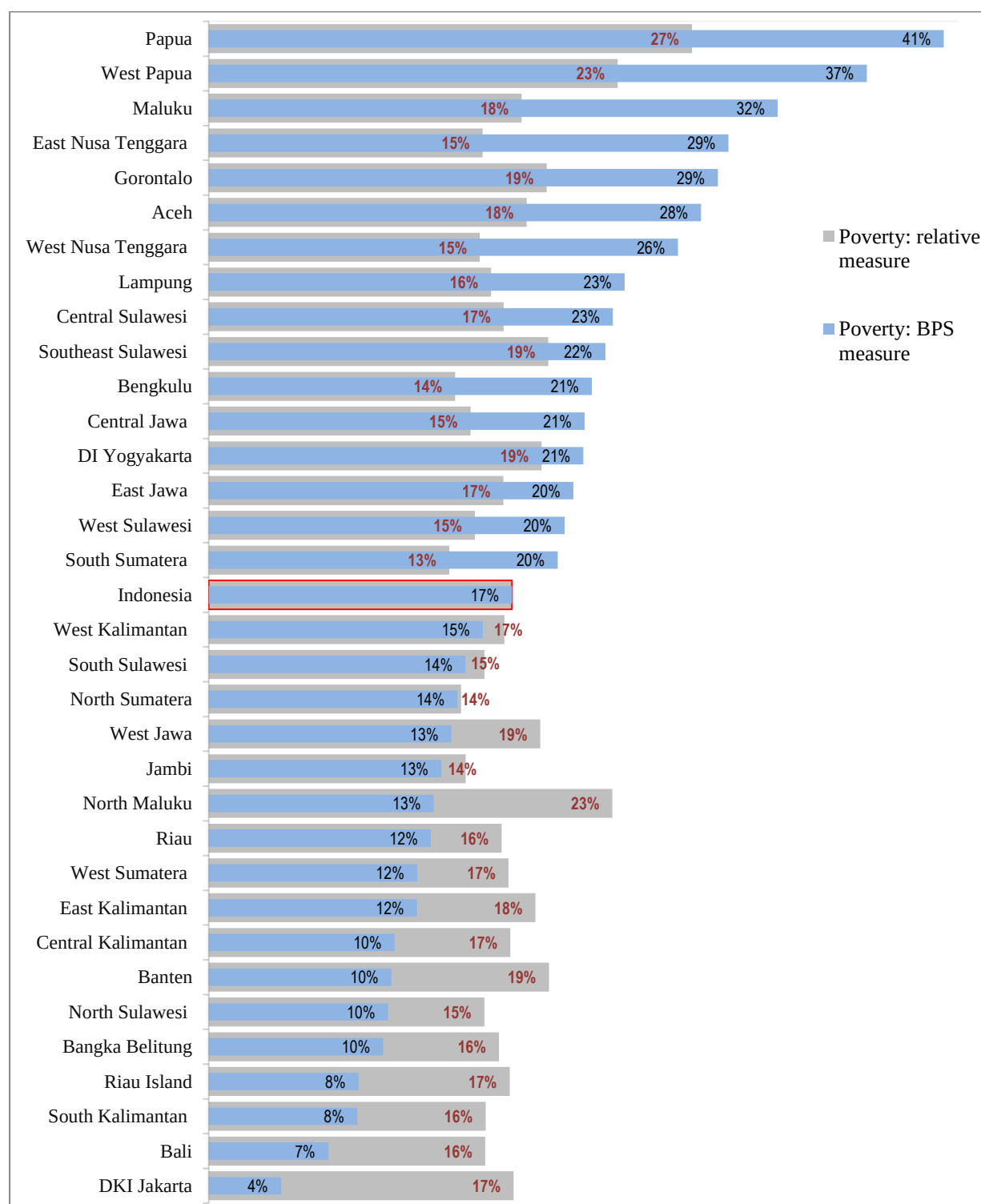
It is also useful to note that the provinces that fall *above* the national average, as well as those that fall *below* the national average, have remained stable across the BPS measure and the \$1.25 a day measure. The ranking from the poorest to the least poor provinces has shifted, but minimally. This suggests that the ranking of the provinces is stable according to the different measures of poverty anchored to the basic needs approach.

2.3.1.3 Comparing poverty based on the BPS measure versus a relative measure

Figure 2.3 presents a comparison of poverty using the BPS method (represented by the blue bar) versus 66 percent of the median expenditure (represented by the light grey bar). It is useful to reiterate that the 66 percent median is used as the poverty line because average poverty based on this benchmark is similar to the average poverty using the BPS method.

Figure 2.3 suggests that Indonesia's regional poverty profile is slightly more similar when using a relative measure than an absolute measure. Relative poverty ranges between 14 to 27 percent across provinces compared to the wider gap of 4 to 41 percent using an absolute measure. This may relate to the definition of relative poverty, that is, the measure is sensitive to the distribution of welfare within a province. As such, Indonesian areas are much more similar when using a relative measure than other measures of poverty.

Figure 2.3. A comparison of poverty using the BPS measure and a relative measure, by province, 2000–2009, Indonesia



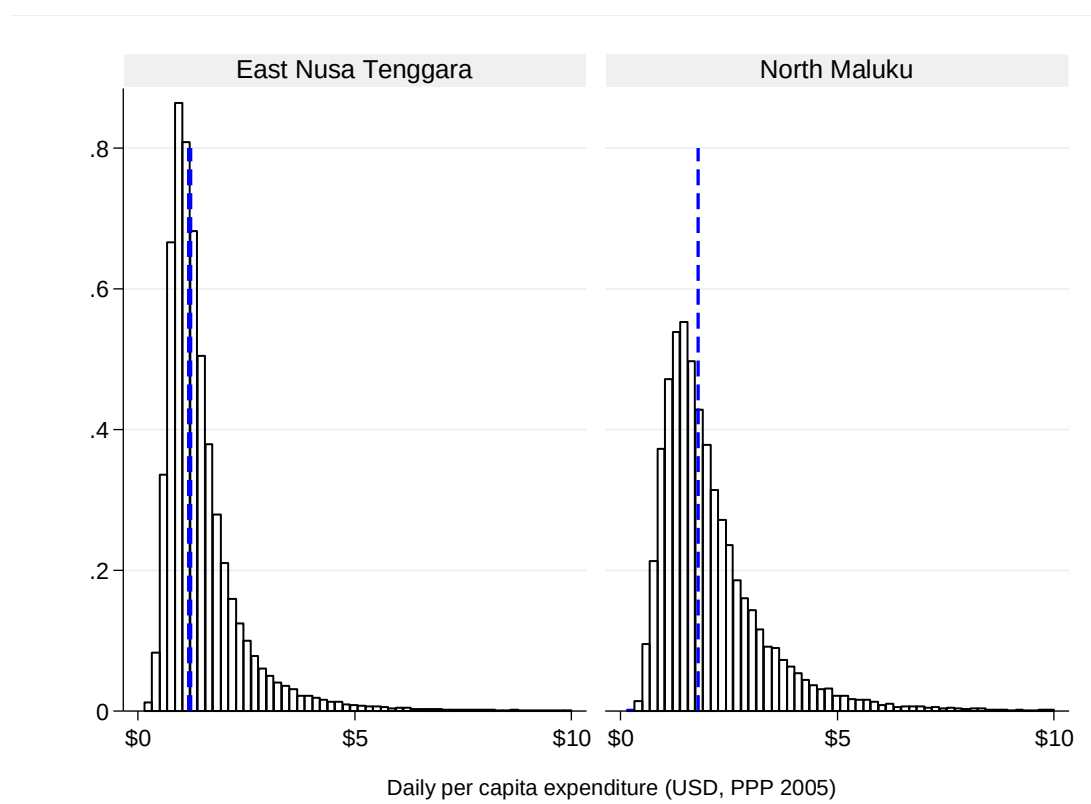
Note: Data is sorted from highest to lowest level by BPS poverty; Percentages of relative poverty are presented in a red font, while the black fonts represent BPS poverty

A striking feature of Figure 2.3 is that provinces with high relative poverty are the same provinces that account for low BPS poverty. In Jakarta, poverty increases more than fourfold using a relative poverty line compared to the basic needs line. Similarly, in North Maluku, average poverty increases by some 10 percent when a relative line is applied compared to the BPS line. A range of other provinces (Banten, Bali, Riau Islands, South and East Kalimantan and Bangka Belitung) experience a similar rise in poverty levels when an alternative concept of poverty is applied, such as relative poverty. An additional unifying factor across these provinces is that most provinces are located outside of the eastern region, with exception of North Maluku.

Another important aspect of the results illustrated in Figure 2.3 is that the poorest provinces ranked according to the BPS measure experience a substantial drop in poverty when poverty is measured relatively. Poverty fell by more than 10 percent in Maluku, Papua, West Papua, East and West Nusa Tenggara, Aceh and Gorontalo.

The results in Figure 2.3 suggest that poverty increases in GDP-high regions and falls in GDP-poor regions when we shift from a BPS measure to a relative measure. Why is this so? Two examples are explored: East Nusa Tenggara and North Maluku. Average poverty in East Nusa Tenggara is 29 percent according to the BPS measure, but falls to 15 percent according to a relative measure. In contrast, average poverty in North Maluku is 13 percent according to the BPS measure, but rises to 23 percent according to a relative measure. Figure 2.4 show a comparison of the distribution of the daily *per capita* expenditure between both provinces. The histogram shows that the welfare distribution is more heterogeneous in North Maluku, whereas it is tightly clustered (less heterogeneous) in East Nusa Tenggara, resulting in a lower average median (blue dash line) in the latter. It is not surprising to find a more dispersed welfare distribution in high GDP regions in comparison with low GDP regions. This is because low income regions are dominantly characterised by employment in the agricultural sector, where wages are more equal. In a sense, if one follows the argument of Warr (2011) that relative poverty is a measure of inequality, then the results suggest higher levels of consumption inequality in GDP-rich regions of Indonesia.

Figure 2.4. Distribution of daily *per capita* consumption expenditure, 2000–2009, East Nusa Tenggara and North Maluku, Indonesia (the blue dashed line represents the average median expenditure)



2.3.1.4 A summary of provincial poverty ranking by different measures of poverty

As a simplification of the results, the extent to which the ranking of provinces differ by different measures of poverty is summarised in Table 2.1. The BPS measure and the \$1.25 a day measure identifies the same set of provinces with an average poverty above the national average. There is some shift in the ranking of the poorest provinces, but this is minimal. A consensus between both measures of poverty is that poverty is most prevalent in Papua, West Papua, Maluku, East Nusa Tenggara, Gorontalo, all located in the eastern region.

The ranking from the poorest to the least poor provinces shifts significantly with the application of a relative poverty measure when compared to the ranking under a BPS measure. It is of interest to note the five provinces that emerge with a higher average poverty than the national average (highlighted in bold, Table 2.1). This set of provinces is ranked the least poor of the 33 provinces in Indonesia using the BPS measure, but rank among the poorest provinces using a relative measure. This suggests that the ranking of the provinces is

sensitive to different concepts of poverty. In other words, poverty defined using the basic needs approach and poverty defined using the relative approach result in very different patterns of geographical poverty in Indonesia.

Table 2.1. Ranking of the poorest provinces (poverty above the national average)

BPS measure	\$1.25/day measure	Relative measure
Papua	Papua	Papua
West Papua	East Nusa Tenggara	West Papua
Maluku	West Papua	North Maluku
East Nusa Tenggara	Gorontalo	Banten
Gorontalo	Maluku	Southeast Sulawesi
Aceh	Lampung	Gorontalo
West Nusa Tenggara	West Nusa Tenggara	DI Yogyakarta
Lampung	Aceh	West Java
Central Sulawesi	Central Sulawesi	East Kalimantan
Southeast Sulawesi	Bengkulu	Aceh
Bengkulu	Southeast Sulawesi	Maluku
Central Java	West Sulawesi	DKI Jakarta
DI Yogyakarta	Central Java	
East Java	South Sumatera	
West Sulawesi	East Java	
South Sumatera	DI Yogyakarta	

2.3.1.5 Mismatch between measures of poverty

In the course of determining the reliability of poverty measures used to identify the poor, a vital debate has revolved around the mismatch between measures of poverty. Individuals may be poor by one measure of poverty, while not being classified as poor using an alternative measure. For purposes of simplification, the extent of the mismatch using different measures of poverty is presented by major regional islands, but detailed province level results are available in the Appendix.

Table 2.2 shows that if one insists on identifying the poor solely using the BPS measure, then some one-fifth of the population living on the islands of Nusa Tenggara, Papua and Maluku, as well as another one-fifth living on the island of Sulawesi, will not be counted as poor despite being identified as such using the \$1.25 a day measure. By zooming into specific provinces (Table B.4, Appendix), the results show important concerns, for example the fact

that about one-fourth of the East Nusa Tenggara population is identified as poor by the \$1.25 a day measure but not by the official measure. In sum, a comparison between the BPS measure and the \$1.25 a day measure suggests that focusing solely on any single measure excludes a significant share of the population identified as poor.

Table 2.2. Poverty mismatch between the BPS measure and the \$1.25 a day measure, by major islands, Indonesia, 2000–2009

	Non-poor according to both measures	Poor only according to the BPS measure	Poor only according to the \$1.25 a day measure	Poor according to both measures
Nusa Tenggara, Maluku & Papua	51%	0.4%	19%	29%
Sulawesi	63%	0.3%	19%	18%
Kalimantan	74%	0.3%	14%	11%
Sumatera	66%	0.6%	17%	17%
Java and Bali	68%	0.7%	15%	16%
Indonesia	66%	0.5%	16%	17%

Table 2.3 shows that, on average, between 1 and 7 percent of individuals are only identified as poor using a relative measure throughout the period under examination across the five major islands. A closer look by province (Table B.5, Appendix) shows important concerns, for example the fact that 14 percent of the population in Jakarta is identified as relatively poor, but the same proportion of the population is identified as non-poor using the BPS measure.

Table 2.3. Poverty mismatch between BPS measure and relative measure, by major islands, Indonesia, 2000–2009

	Non-poor according to both measures	Poor only according to the BPS measure	Poor only according to a relative measure	Poor according to both measures
Nusa Tenggara, Maluku & Papua	70%	12%	1%	17%
Sulawesi	80%	4%	2%	14%
Kalimantan	82%	1%	7%	10%
Sumatera	79%	5%	3%	13%
Java and Bali	80%	4%	4%	13%
Indonesia	79%	5%	3%	13%

2.3.2 How robust is the regional poverty level using various equivalence scales?

So far we have tested the robustness of the subnational ranking using various measures of poverty. However, the BPS, \$1.25 a day and relative poverty measures are based on a *per capita* welfare measure, that is, aggregate household welfare is simply divided by household size (Equation 2.2). The sensitivity of poverty measures based on the simple *per capita* approach is tested by exploring three other equivalence scales (the OECD scale, the squared root scale and the FAO/WHO scale), which that take into account the differences in needs by age and/or gender and/or economies of scale in consumption. The results are summarised in Table 2.4.

BPS poverty based on a *per capita* scale shows that 17 percent of the Indonesian population is poor. By applying various other scales, BPS poverty ranges between 0.3 percent and 5 percent. In Nusa Tenggara, Papua and Maluku, the region with the highest level of poverty in Indonesia, BPS poverty based on *per capita* scale fell from 29 percent to between 1 percent and 10 percent when other scales were applied. Similarly, applying the \$1.25 a day measure that is adjusted using scales other than *per capita* shows unrealistic levels of poverty in the poorest region of Indonesia: between 4 and 24 percent, depending on the scale. One may argue that the OECD and square root scales are more applicable to developed economies, while the FAO/WHO scale with discount factors based on relative caloric needs and a conservative estimate of the economies of scale is more applicable to developing economies (Batana et al., 2013). Poverty, however, according to the BPS measure and the \$1.25 a day measure, is unrealistically low even when the FAO/WHO scale is applied. It makes no sense that the application of the equivalence scales have resulted in substantially fewer poor people when in reality the public are protesting that the BPS poverty measure has failed to reflect the increase in absolute hardship and has failed to identify many more poor.³⁴

³⁴ Action in Solidarity with Asia and Pacific, 15 August 2008
& http://blogs.usyd.edu.au/maxlaneintlusia/2006/09/protests_and_number_of_poor_on.html

Table 2.4. Poverty using various equivalence scales and poverty lines, by major islands, Indonesia, 2000–2009

Regions	<i>Per capita</i>			OECD scale			Root square scale			Calorie intake scale		
	BPS poverty	\$1.25 a day	Relative poverty	BPS poverty	\$1.25 a day	Relative poverty	BPS poverty	\$1.25 a day	Relative poverty	BPS poverty	\$1.25 a day	Relative poverty
Nusa Tenggara, Maluku & Papua	29%	48%	18%	7%	19%	16%	1%	4%	16%	10%	24%	16%
Sulawesi	17%	35%	16%	3%	10%	15%	0.2%	1%	14%	4%	14%	14%
Kalimantan	12%	26%	17%	2%	7%	15%	0.1%	1%	16%	3%	10%	15%
Sumatera	17%	33%	15%	3%	9%	15%	0.2%	1%	13%	3%	14%	13%
Java and Bali	16%	30%	17%	3%	10%	16%	0.3%	1%	16%	5%	14%	15%
Indonesia	17%	32%	17%	3%	10%	15%	0.3%	1%	15%	5%	14%	15%

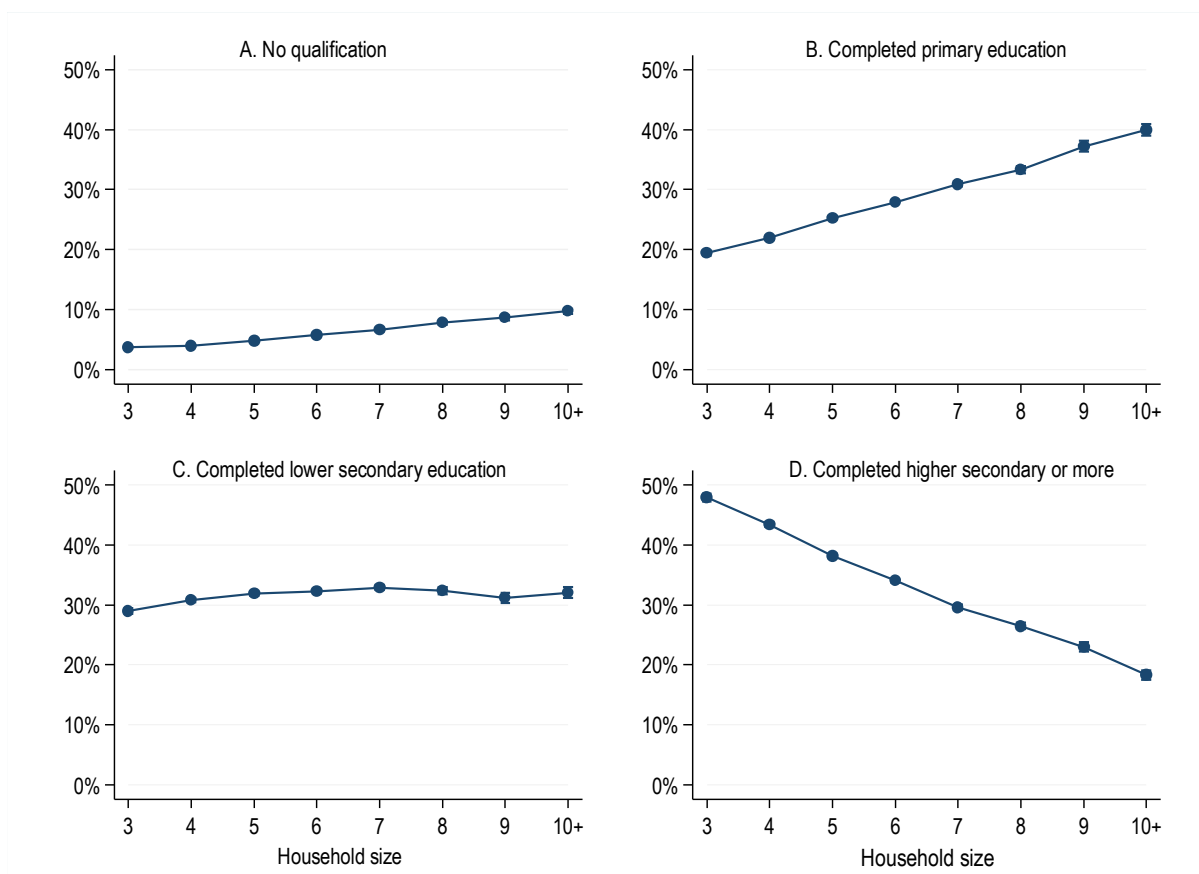
It seems that a poverty headcount is problematic when combined with various equivalence scales other than the *per capita* scale. This is, however, only true for poverty measures that are constructed using the basic needs approach. It is less of a problem for poverty measured using the relative approach. In Indonesia, relative poverty based on the *per capita* approach is 17 percent, while it declines to 15 percent based on other scales, suggesting that relative poverty is quite stable using various scales. This suggests that the degree to which poverty is affected by the choice of equivalence scales is dependent on how the poverty lines of those measures are constructed, and whether or not those lines are also adjusted for differences in adult-child needs and/or economies of scale.

The results in Table 2.4 suggest that in the context of Indonesia, the *per capita* approach is the most applicable among the existing equivalence scales to convert household welfare into individual welfare measures. Of course one may argue that it is best to go with poverty measured using a relative approach adjusted for differences in needs and economies of scale in consumption; but a relative poverty measure misrepresents regions where basic needs deprivation is still of great concern. This therefore leaves us with poverty measured using a basic needs approach that responds well to the *per capita* scale, but is problematic if it is adjusted using the OECD, root square or the FAO/WHO scales.

By opting for poverty measures that apply the *per capita* scale, we are faced with one other important concern. The *per capita* scale tend to lead to the conclusion that larger households are associated with higher risk of poverty. This is because the *per capita* approach assumes that all household members consume equally, hence understating welfare in households with a higher fraction of children. For example, household A of three adults may have very similar consumption expenditure to household B of 2 adults, 2 children and 1 baby. However, when the *per capita* scale is applied, the per person consumption expenditure for members in household B is lower than members in household A. As such, members in household B are likely to be identified as poor. Is the lower welfare among larger families a genuine reflection of the society or is it an artefact of the *per capita* scale? Additional analyses are undertaken to understand the association between family size and children's educational attainment. Education is used as a proxy for individual's non-income welfare thus eliminating the question of equivalence scale for the time being.

Specifically, the research question explored in this section is: are children from larger families associated with lower educational attainment than children from smaller families? The research question is explored using a sample of 809,214 young Indonesians aged 15 to 30, who have completed education and who live in a two-parent household. The short age span allows us to focus on those who have completed schooling within a reasonable timeframe of the survey year. An exclusive focus on young individuals from two-parent household allows us to disregard the differences in resources that commonly exist between single-parent and two-parent households. The dependent variable is the individual's highest level of educational attainment (no qualification; primary; lower secondary; or higher). The independent variables are household size, gender, age, father and mother's years of schooling, household monthly consumption expenditure, province, rural location and survey year. Predicted probabilities are calculated from the multinomial regression model and the results are illustrated in Figure 2.5.

Figure 2.5. Predicted probabilities of individual educational attainment by household size



The results suggest that the probability of young Indonesians completing higher education is higher if they come from smaller families or is lower if they come from larger families. The probability of a young person completing higher secondary is only 18 percent for those living in a household of 10 or more members, while it is 48 percent for those living in a 3-member household. Young individuals from very large households have a 40 percent probability of leaving education at the primary level, while this proportion falls noticeably for individuals from smaller families.

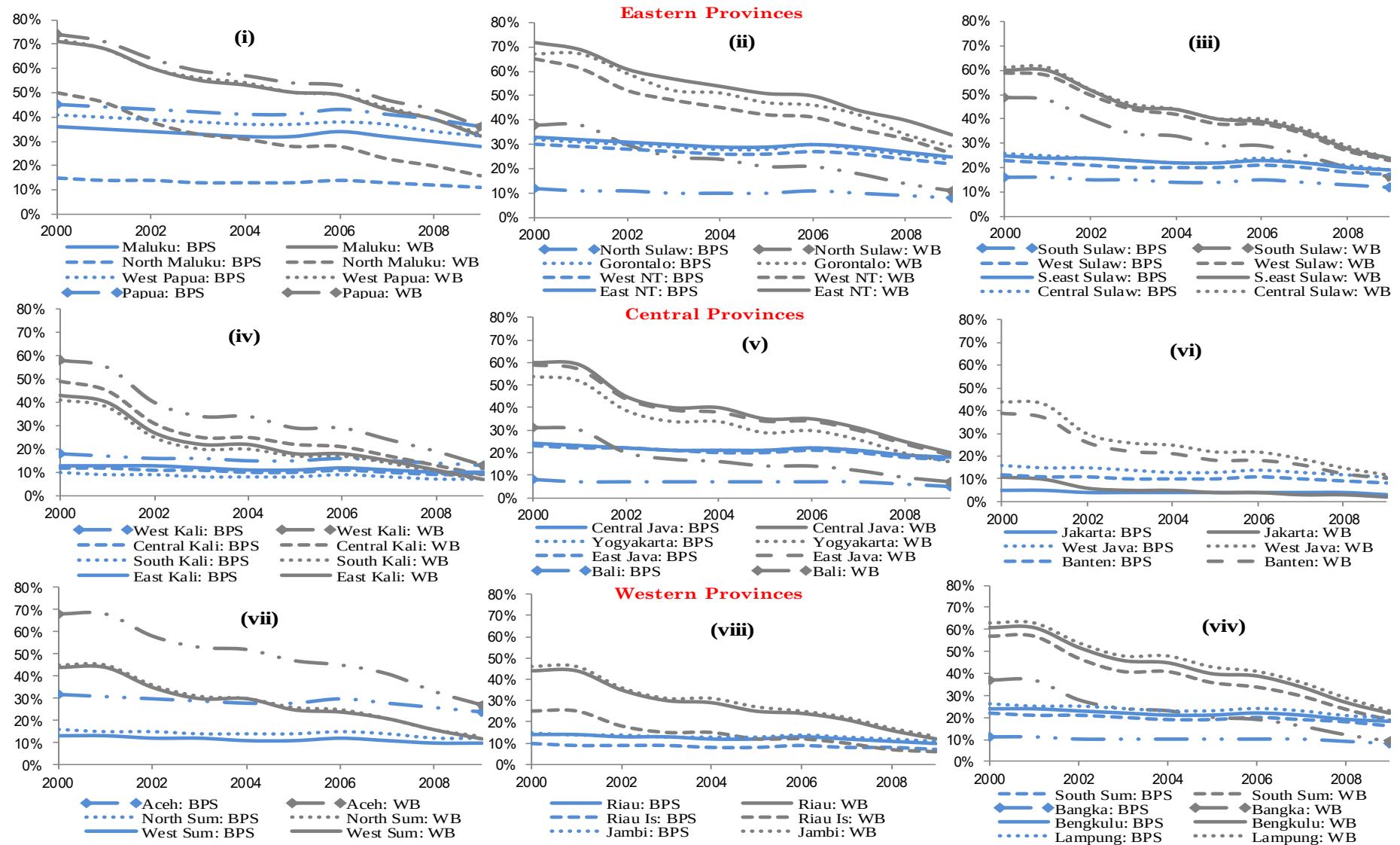
The lack of higher education is more likely to place young Indonesians at disadvantage in the formal sector employment, increasing their risk of remaining at a low income level. It is not, therefore, surprising to find a positive association between family size and poverty. In other words, the positive association between family size and educational deprivation among children can be seen as lending support to the argument that there may be some genuine reflection that family size and poverty is positively associated. This in turn points towards the validity of using household size to convert household level welfare to per person welfare.

2.3.3 Is poverty consistently higher in the eastern part of the country according to various measures of poverty?

A logit model was generated with poverty as the dependent variable and dummies for province and year of study as the only independent variables. This allowed for a clearer picture of poverty trends throughout the 2000s. Figure 2.6 illustrates the predicted probabilities of poverty throughout the period under study for two measures of poverty. The blue line represents the BPS measure, while the grey line represents the \$1.25 a day measure. The results are summarised in three points.

First, the regional trend shows that the probabilities of poverty have been declining in all provinces since 2000. The degree of reduction is, however, different for each measure of poverty. Poverty reduction is faster using the \$1.25 a day measure (grey line), which is a positive sign given that poverty levels according to this particular measure were recorded to be high at the start of the millennium. However, if the BPS measure is taken to represent abject poverty, then it can be assumed that the progress in reducing poverty at that level has been very slow, as illustrated by the almost flat blue trend lines.

Figure 2.6. Poverty trend: BPS measure (legend: BPS) versus the World Bank's \$1.25/day measure (legend: WB), 33 provinces, Indonesia, 2000–2009



Second, across both measures of poverty and throughout the period of study, the decline in probabilities of poverty is much slower in most provinces in the eastern region (Figure 2.6, i-iii) in comparison with other regions. As a result, the probabilities of poverty remain persistently high over time among most provinces in the eastern region. There are, however, outliers in other areas of the country too: Aceh (Figure 2.6, vii), Lampung, Bengkulu and South Sumatera (Figure 2.6, viv) in the western region and Central Java, East Java and Yogyakarta in the central region (Figure 2.6, v). In these provinces, the decline in probabilities of poverty is also slow, particularly those in the western region.

Third, it is worth noting that, over time, the probabilities of poverty almost converge for almost all provinces across the different measures of poverty. Particularly from 2007 onwards, probabilities of poverty using the \$1.25 a day measure are similar to the probabilities of poverty using the BPS measure (notably among provinces on the island of Kalimantan).

It is also useful to note the staggering gap in the probabilities of poverty between both measures of poverty in the early part of 2000s. Probabilities of poverty are much higher using the \$1.25 a day measure than the BPS measure. The fact that a much higher share of the population was identified as poor using an alternative measure during a period in which the country was recovering from the negative impacts of the 1997–98 financial and political crisis suggests the inadequacy of the BPS measure for this period. It is also useful to revisit Figure 2.2, which shows that average poverty throughout the period under study is substantially higher using the \$1.25 a day measure. In some of the provinces, poverty almost doubled when the statistics obtained according to the BPS measure were compared with those obtained according to the \$1.25 a day measure. Much of the reason for these differences actually comes from the differences observed in the early 2000s, as can be ascertained by examining Figure 2.6.

2.4 Discussion

The aim of this chapter is to compare the extent of Indonesia's geographical differences in poverty as identified using the official (BPS) measure in combination with two alternative measures. The first point of comparison is poverty based on the BPS measure and the World Bank's \$1.25 a day measure. The poverty lines of both these measures are anchored to the basic needs approach. The second point of comparison involves BPS poverty and relative poverty, where the poverty lines of the latter are anchored to the average living standard in a given province. The findings show that average poverty at the province level for the period under study ranges between 4 and 41 percent using the BPS measure, between 5 and 54 percent using the \$1.25 a day measure, and between 13 and 27 percent using a relative measure. There are two important points to note as a result of this comparison. The first point lends credibility to the BPS and \$1.25 a day measure. The second point discounts the relevance of relative poverty in the context of Indonesia.

First, the comparison between poverty measures reveal that some 33 million *additional* Indonesians are identified as poor using the \$1.25 a day measure rather than the BPS measure. The \$1.25 a day poverty line represents an average increase of \$0.17 cents from the BPS line. This certainly represents a tiny increase in the living standards of an average Indonesian, but the staggering number of Indonesians identified as poor by such a small increase in the monetary value of the regional poverty line highlights the *basicness* of the BPS poverty line and strengthens the argument to adopt a complementary measure of poverty. Furthermore, the comparative analyses allow for a reflection that the BPS poverty measure falls short when compared to the standards of the poorest 15 countries in the world.

It is nevertheless important to note that these poverty figures are averages for the period under study (2000–2009, a span of 10 years). A closer look at the poverty for each survey year reveals that the substantial difference between both the BPS and \$1.25 a day measures is driven by poverty trends in the early 2000s. In particular, the poverty gap between BPS measures and \$1.25 a day reached its highest point in 2000 and 2001 (as illustrated in Figure 2.6). It is also useful to mention that the substantial mismatch in individuals identified as poor across the BPS measure and the \$1.25 a day measure is driven by trends in the early 2000s.

In this respect, there is some added value of using multiple measures of poverty. For example, the alternative \$1.25 a day measure reveals that poverty in the early 2000s was a far more serious issue than is reflected by the figures derived from applying the BPS measure. It is interesting to note the comparatively low levels of poverty using the BPS measure during a time period in which the country was recovering from the devastating impact of the 1997–98 financial and political crisis. The added value here is the knowledge that millions of supposedly non-poor Indonesians identified using the BPS measure were in fact clustered very closely to the BPS line during this vulnerable period. Hence, when a slightly higher poverty line is applied (as in the case of the \$1.25/day line, which represents an average increase of \$0.17 cents from the BPS line), significantly more Indonesians are identified as poor. In the later part of the 2000s, however, poverty trends were converging between both measures of poverty. This suggests that in the later part of the decade, the majority of the non-poor Indonesians identified by the BPS measure had living standards that were some distance away from the BPS line. By applying a slightly higher value poverty line, therefore, poverty increases minimally, showing that there was some degree of reliability of the BPS poverty line later in the decade. Moreover, the comparison reveals that the ranking of the poorest to the least poor provinces remains quite robust across the BPS and the \$1.25 a day measures.

Second, the comparison between the measures reveals that provinces with high relative poverty are the same provinces that account for low poverty according to the BPS measure; in contrast, provinces with low relative poverty are the set of provinces that account for high BPS poverty. This chapter argues that this pattern is observed because a relative definition is sensitive to the distribution of consumption in a given province. In less developed provinces such as East Nusa Tenggara and Aceh, consumption is clustered closely to the lower left end of the distribution tail (as illustrated by the histogram in Figure 2.4). For the majority living in these provinces, employment is centred in the informal agriculture or low-end services sector and these jobs are typically characterised by low pay. The median poverty lines are thus likely to be low, in most cases well below the basic needs line. Relative poverty therefore appears lower in these provinces than poverty measured using the basic needs approach. In contrast, in developed provinces such as in Jakarta or North Maluku, employment sectors are much more diversified ranging from various high-end industries to low-end services, suggesting wider variation in wages. The median poverty lines in these provinces are thus likely to be high, resulting in higher relative poverty.

There are three reasons why poverty measured using a relative approach is less suited to the Indonesian context. The first, briefly mentioned above, is that in 16 of the 33 provinces, the average median expenditure (the relative poverty line) is lower than the basic needs poverty line. A relative line that is below a frugal basic needs line makes no sense.

The second follows the argument that the application of a relative line is only valid in cases where abject poverty has been eliminated (Atkinson, 2015). There is some evidence in the literature that relative poverty is more applicable than basic needs poverty in the context of middle-income countries that have seen a substantial rise in their living standards (Atkinson and Bourguignon, 2001). The question is whether Indonesia is the middle-income nation that the World Bank classifies it to be. If one references the national average GDP, then yes, Indonesia is a middle-income country. But a closer look at the subnational ranking will reveal that many of the provinces, particularly on the eastern belt, are lower-middle income or low income provinces by the GDP measure. In these provinces, poverty is prevalent using a basic needs approach, suggesting that a relative line is of less relevance.

Third, poverty reduction policies for poor areas have little value (or are undermined) when the ranking of the poorest to the least poor provinces differ substantially between different measures of poverty, as it is in the case of a relative measure versus a basic needs measure. Following these arguments, this chapter argues that poverty measures anchored to the basic needs approach are more relevant to Indonesian society than poverty measured using a relative approach.

Additional work was also undertaken to test the robustness of the poverty measures by various equivalence scales. The application of the OECD scale, root square scale and FAO/WHO scale result in unrealistically low poverty levels when compared with the more common *per capita* scale. The numbers are unrealistic going by the scenario that Indonesians have been protesting that the official poverty figures estimated following the *per capita* approach is too low and fails to account those going through hardship. However, the unrealistic low numbers are only an issue for poverty that is measured using the basic needs approach, suggesting that the problem lies in how the poverty lines are constructed. The BPS and international \$1.25 a day poverty lines are *per capita* lines. The effects of age, gender and economies of scale are not taken into account while constructing the *per capita* lines. In other words, it makes little sense to apply a poverty line that is not adjusted for economies of

scale and household demographic composition on a welfare data that has been adjusted for these factors. Furthermore, food expenses comprise more than 70 percent of the monetary value of Indonesia's provincial poverty lines (BPS, 2009). In reality, food consumption bundle have few scales of economy. This chapter concludes that, in the context of Indonesia, the *per capita* scale is appropriate when inferring individual living standards from household data.

This chapter recognises the contention that the positive association between family size and poverty may be a methodological artefact arising from the limitations of the *per capita* scale. This argument is put to test by exploring the association between family size and educational attainment (a non-income domain). The findings suggest that young Indonesians from large families are more likely to have primary schooling as their highest qualification, while individuals from smaller families are more likely to have higher secondary schooling or more as their highest qualification. In other words, family size has negative association with educational outcomes. This chapter therefore argues that there is some degree of reliability in the positive association between family size and poverty, and that the association is not completely a methodological artefact arising from the limitations of the *per capita* scale. In the context of Indonesia, therefore, poverty based on *per capita* welfare information is reliable.

2.5 Conclusion

A controversial aspect of poverty is that different measures of it produce different numbers of poor. This chapter concludes that using multiple measures of poverty has added value, but the comparison should be based on measures of poverty that are anchored to concepts of poverty that are relevant to the Indonesian society. The ranking of provinces from poorest to least poor is fairly robust by different measures of poverty that are anchored to the basic needs approach. But the ranking shifts substantially when the poverty measure is based altogether on a very different concept, such as the relative approach.

This chapter also concludes that there is merit in inferring individual welfare from household data using a *per capita* equivalence scale if poverty is based on the basic needs approach. More importantly, if one insists on applying scales that take into account the differences in needs and economies of scale in consumption, then poverty lines must also accommodate family composition effects. Reconstructing the BPS lines is beyond the scope of this chapter.

This chapter confirms that where a person lives is independently significant and very important quantitatively in explaining poverty across Indonesia. However, ‘location’ merely describes the fact that the people who live there are poor. It stops short of explaining *why* the people who live there are poor. This aspect is explored in the following three empirical chapters of this thesis. Chapter 3 investigates the robustness of the negative association between GDP and poverty in an environment where informal workforce is prevalent. Chapter 4 explores the relevance of education for individual’s employment and poverty. This chapter then estimates the probability of poverty for a given level of education and employment by region. The final empirical chapter, Chapter 5, explores the economic vulnerability of female-headed households, particularly households headed by women who are divorced or widowed, in comparison with other types of households. The chapter seeks to address whether head-of-household women living in poorer regions of the country are more vulnerable than their counterparts living in other parts of the country.

Chapter 3

Understanding the Relationship between GDP and Poverty in an Environment with Prevailing Levels of Informal Workforce, Indonesia, 2000-2009

3.1 Introduction

The share of Indonesians living below the official poverty line fell from 30 to 11 percent between 1984 and 1996,³⁵ while GDP *per capita* grew at an annual rate of four to five percent. This suggests that, for every one percent of growth in macro-level income on average, the proportion of Indonesians living in poverty fell by three percent. The relationship between macro-level economy and poverty is, however, heterogeneous across the Indonesian archipelago. Although on average a growing economy has reduced poverty in all provinces, it has reduced poverty significantly less in some provinces (Friedman, 2005). The suggested explanation for the heterogeneity has been the level of inequality across the society (Miranti, 2010; Friedman, 2005).³⁶ It is argued that, even when the average economy is growing, if income generated from the economy is poorly distributed (high inequality), this leaves poverty untouched (Donaldson, 2008; Easterly, 2001). This chapter moves away from the inequality argument to a less explored explanation: the nature of employment.

An important medium through which macro-level economy reduces poverty is through employment creation (Bhagwati and Panagariya, 2013). However, a growing economy may matter less for poverty in cases where employment is primarily of an informal nature.³⁷ In Indonesia, between 2000 and 2009, 60 percent of the working-age population on average was in employment. Of this proportion, 63 percent were informal workers. Furthermore, the share of the informal workforce varied substantially across provinces: from 28 percent in Jakarta to 83 percent in East Nusa Tenggara.³⁸

³⁵ These poverty figures are computed by Miranti (2010) using the BPS revised poverty line methodology. Since 1999, BPS estimates poverty using a revised poverty line methodology (Priebe, 20114).

³⁶ The definition of inequality has been confined within the space of income or expenditure as such to a set of summary statistics such as the Gini coefficient.

³⁷ This chapter assumes that the welfare of a region (measured using GDP per person) affects employment creation. Following this assumption, time-lag GDP data from national accounts was applied on current employment data estimated from household survey. Details are provided under the Data, Variables and Methodology section of this chapter.

³⁸ In other words, 72 percent of the workforce in Jakarta and 17 percent in East Nusa Tenggara are formal workers.

Less is known about the way in which Indonesia's regional economy is associated with poverty following the prevalent share of informal workers. This chapter therefore investigates the question: *To what extent does the economy, measured by GDP per person, matter for poverty when informal employment is taken into account?* The empirical section of this chapter starts by establishing the general trend between GDP and poverty, followed by comparisons between the major regions of the archipelago and over time.

The findings of this chapter contribute to the development literature, particularly on the nexus between growth, employment and poverty. Despite being recognised as an emerging market economy, much less is known of the relationship between Indonesia's regional economic pie and poverty in an environment where the share of informal workers vary substantially. This chapter also moves away from the general practice of using mean expenditure consumption from household survey as indicator of the 'economy' (Miranti, 2010; Dollar and Kraay, 2002; Ravallion and Chen, 1997). Instead, GDP per person is used as measure of macro-level economy. This is considered more apt, since the interest of this chapter is whether macro-level economy influences poverty differently in an environment where informal employment prevails.

Two main sources of data are used in this study: firstly, the National Socioeconomic Survey of Indonesia (SUSENAS) 2000–2009 is used as a source for computing regional share of poverty and informal employment;³⁹ and secondly, GDP data from the regional accounts data, along with the provincial population data, made available by the Indonesian Central Bureau of Statistics (BPS in its Indonesian acronym) upon request.

The rest of this chapter is organised as follows. The next section is an overview of Indonesia's employment trend. The second section presents the literature review and the hypothesis. The third section addresses the data and methods used to test the hypothesis raised in this chapter. The results are presented in the fourth section. The section starts with understanding the bivariate association between GDP-poverty, GDP-share of informal workforce, and the share of informal workforce-poverty.

³⁹ An exception to this decision is the 2008 survey data. Information on household expenditure was not collected as part of the SUSENAS Core 2008. So I have drawn data from the SUSENAS Module (Expenditure and Income) 2008 instead. The sample size for 2008 is much smaller compared to other survey years. However the weighting of the sample, developed by BPS, allowed for the variables to be comparable to the core sample.

The final part of the results section covers the testing of the hypothesis. This is followed by a discussion, presented in the fifth section. The chapter ends with conclusions drawn from the findings.

3.1.1 An overview of Indonesia's employment trend

Despite being recognised as a middle-income country and an emerging economy, the majority of Indonesia's workforce has been engaged as informal workers, while a smaller share of the working population has enjoyed the privileges of formal employment. There was great concern about employment opportunities in the period between 1960 and 1970. A review by Manning (1998) of the Indonesian labour market during this period indicates that the high proportion of unskilled workers were either centred in low productivity agriculture or in the traditional rural non-agricultural sector dominated by family and micro-enterprises. The minority of high school and university graduates competed for the limited employment opportunities in the government and military sector. Arndt (1975) aptly describes the employment scenario during the 1960s by pointing out that the crucial societal problem was no longer lack of food but the constraints in employment expansion outside the traditional agricultural pursuits.

The 1980s witnessed a positive upturn in employment creation in the non-agricultural sector, particularly of formal nature. Much of this achievement is attributed to the acceleration of economic development that characterised the period. During the first half of the 1980s, Indonesia's economy grew at an average rate of five percent per year, increasing to close to seven percent by the first half of the 1990s (Agrawal, 1996, Table 1). The expansion in the manufacturing sector and services sector underlined the growth of the overall economy.⁴⁰ A notable size of the workforce reallocated from agriculture to non-agriculture jobs. As a result, the share of the workforce in the agricultural sector fell from 55 to 50 percent between 1980 and 1993, while it rose slightly from 33 to 34 percent in the services sector and from 9 to 11 percent in the labour-intensive manufacturing sector. In particular, formal jobs were primarily created in export-orientated industries, such as textiles, garments and footwear (Agrawal, 1996). Despite the expansion in non-agricultural sectors, however, the prevailing share of employment was still located in the agricultural sector.

⁴⁰ Sectoral data between 1980 and 1993 shows that agriculture's share of real GDP fell from 25 percent to 18 percent, while the share of manufacturing increased by 10 percentage points (from 11 to 21 percent) and the share of services in GDP grew from 34 to 40 percent (Agrawal, 1996, Table 2).

The expansion in the manufacturing and services industries also demanded infrastructure development, resulting in high shares of construction jobs (Manning, 1998:63). Although these were predominantly blue-collar jobs, they were mostly steady full-time employment characterised by legal contracts and stable wages paid on weekly or monthly basis, and included medical leave and health benefits – very much characteristics of formal employment. It is thus not surprising that wage employment in the non-agricultural sector grew slightly faster (at an average of six percent per year) than total wage employment (Agrawal, 1996:10). Although the *average* wage levels were low, many argue that the wages from formal employment were still above those prevailing in agriculture and the informal sector (Aswicahyono, Hill and Narjoko, 2011:113; Agrawal, 1996:40).

More importantly, the labour-intensive industries absorbed Indonesia's plentiful workers who came with minimum levels of educational qualification and who would have been economically worse off without these industries. Correspondingly, previous studies show a strong positive association between Indonesia's average household consumption and poverty reduction during the period of economic boom (Balisacan, Pernia and Asra, 2003; Suryahadi, Suryadarma and Sumarto, 2009; Miranti, 2010). In other words, the expansion in formal employment may partly explain why the share of poor people fell by 19 percent by official measure over a span of 12 years (1984–1996).

Interestingly, despite the economic boom, just under one third of the Indonesian workforce was engaged as formal workers. This suggests that informal employment has been the prominent form of employment for the large majority of Indonesians, even during the rapid economic growth of the 1980s and early 1990s. On average, there is evidence of the increasing formalisation of the workforce associated with the rise in the share of Indonesians employed in the manufacturing industries and to a smaller extent in the services sector but there is substantial regional variation. Much of the creation of formal jobs was noted in the central region of the country, notably on the island of Java.

The economic crisis of 1997–1998, however, reversed the favourable trends of employment in the formal sector. Between 1997 and 1998, GDP *per capita* contracted by 14 percent (Miranti, 2010). Over the same timeline, jobs contracted in the modern sectors of construction, manufacturing and finances (Hill, Resosudarmo and Vidyattama, 2008:408). Poverty increased from 15 to 33 percent between February 1997 and the end of 1998: some

additional 36 million Indonesians were pushed into absolute poverty (although Suryahadi, Sumarto and Pritchett (2003:221) argue that the sharp rise was only temporary). By mid-1999, following the stabilisation of inflation, poverty decreased to 24 percent.

Case studies indicate that the economic crisis showed considerable heterogeneity across regions, with the provinces on the island of Java, the manufacturing belt of the country, experiencing the greatest difficulties (Mukherjee, 2002), though the crisis did spill over to the rural areas. Many who lost their manufacturing-sector jobs were rural migrants who had previously migrated to the city, attracted by the employment opportunities arising from the economic boom. Following the mass retrenchment from manufacturing factories, many were forced to return to their home villages. In their villages, many turned to farming for livelihood. Official figures suggest that an estimated 28 million workers retreated to the agricultural sector and sought employment in the low-productivity informal sector during the peak of the crisis (Dhanani, Islam and Chowdhury, 2009:98).

In the decade following the economic downturn, particularly throughout the 2000s, GDP growth improved by resuming an average of five percent. Poverty rates returned to their pre-crisis levels, but growth in formal employment was slower. In particular, jobs in the manufacturing sector, especially those located on the island of Java, experienced very slow growth. More Indonesians than before became self-employed, or worked for their families without pay (Dhanani et al., 2009). It is less clear how the aggregate level economy and poverty is associated when the current nature of employment is taken into consideration.

3.2 Literature review and hypothesis

This chapter starts by reviewing the general literature on the relationship between aggregate level economy and poverty. This is followed by a brief review of the association between informal employment and poverty. The final section of the review covers the link between macro-level economy, informal employment and poverty. Literature on this subject is rare, but there are studies that have focused on the association between sectoral growth (agriculture, industry and services) and poverty reduction. This allows for interpretation regarding which sector has been more employment-generating, hence more poverty reducing.

3.2.1 The association between aggregate level economy and poverty

There is some evidence to indicate that a growing economy helps the poor. Using a pooled multi-country dataset, Ravallion and Chen (1997) found that a one-percentage change in average consumption expenditure (defined as economic growth) is associated with a three-percentage decrease in the proportion of the population living on less than one dollar a day.⁴¹ Using the same multi-country dataset, Dollar and Kraay (2002) focused on 92 countries with at least two sets of observation. The authors found that every additional percentage change in GDP per person was associated with a one-percentage rise in the mean income of the bottom 20 percent. In other words, a growing economy and poverty reduction are related on a one-to-one basis. It is important to note that the two studies reviewed above differ by how aggregate level economy and poverty is defined. By applying GDP as the measure of the economy, it seems the positive association between economic growth and poverty reduction is much smaller. It may also be the case that the association is over-estimated, since both studies apply the OLS regression technique, which fails to take into account unobserved factors that may influence the association between aggregate level economy and poverty.

Furthermore, Donaldson (2008) identifies 27 countries – with an estimated 375 million people in poverty – as outliers in the dataset constructed by Dollar and Kraay. Among these countries, the rise (or fall) in the poor's income is unlikely to be explained solely by a growing economy (or the lack of it). In addition, the use of summary measures obscures the potential heterogeneity in the association between economic prosperity and poverty that may exist between countries and also within a country, especially in a large country with imperfectly integrated regional economies such as Indonesia (Friedman, 2005).

⁴¹ The dataset applied in Ravallion and Chen (1997) consisted of 67 developing and transitional economies.

In the context of Indonesia, Miranti (2010) explores the association between change in average consumption and poverty reduction across three development periods. All three periods are marked by a distinctive macro-economy climate: 1984–1990 (a period marked by rapid industrialisation and sectoral transformation away from agriculture and towards manufacturing and services), 1990–1996 (a period where real wages grew rapidly but there was a slow-down in the rate of job creations and a rise in inequality measures) and 1999–2002 (a period where displaced workers from the 1997–1998 financial crisis were moving from the shrinking manufacturing sector to the agriculture and the informal sector, along with worsening inequality). It then comes as an interesting observation when Miranti's work shows that the association between growth in average consumption and poverty reduction have been almost stable across these varied development periods, while holding the levels of inequality constant. Using a fixed effects panel method, the author demonstrates that every 10 percent of 'growth' in mean consumption expenditure is associated with falling poverty levels of between 24 percent (in the earlier period) and 25 percent (in the later period). The findings of this study seem to suggest that the average living standard of Indonesians is not affected by the rise in informal employment in the later period. Of course it should be noted that the author has defined 'growth' as the change in average consumption expenditure, using data from the Indonesian household survey. This may not be the best measure to represent macroeconomic conditions. Hence, the point we can claim through Miranti's study is that growth in aggregate household consumption, is positively associated with poverty reduction, and the trend is stable over Indonesia's three major developmental time periods. Macro-level affluence measured using regional GDP may, however, produce alternative findings.

It is also important to note that the unit of analysis (province or district level) and how poverty is defined will result in different outcomes. The positive association between growth in aggregate household consumption expenditure and poverty reduction is much smaller using district level data than province level data. For example, a 10 percent increase in district-level average consumption expenditure raised the living standards of Indonesians in the bottom 20 percent by seven percent between 1990 and 1996 (Balisacan et al., 2003). The association is substantially lower than that shown in Miranti's work, affirming that findings differ when the dependent and predictor variables are measured differently, as well as when those variables are aggregated at a different level (e.g. province versus district). But generally, the association do move in the same direction.

3.2.2 The association between informal employment and poverty

The general perception is that informal workers are associated with irregular employment opportunities, low income levels and unstable income sources: factors that increase their risk of poverty. Case studies from multiple countries by WIEGO⁴² provide a sufficiently large body of evidence showing that households that rely primarily on income from informal employment face a higher risk of poverty than those that rely on income from formal employment.

In contrast, in his examination of the state of informal workers in Indonesia through the 1980s and early 1990s, Wiebe (1996) finds that only a minority (12 percent) of those employed as informal workers faced income insecurity. The author uses underemployment as a proxy for income security.⁴³ The findings seem to suggest that most informal workers make the rational choice to diversify their income sources to reduce household vulnerability brought on by having an income from only one single source. This may be true to some extent, but there are limitations to the study, which uses underemployment as a proxy for income security. There are, however, many low-skilled daily-wage positions (for example, cleaners, cashiers, security guards, warehouse employees and lorry drivers) that go beyond the standard eight hour-a-day shift and yet are poorly paid. In other words, working more than 35 hours a week does not automatically translate to income security.

In the years immediately following the 1997–1998 financial crisis, the displaced formal sector jobs were replaced by employment in the urban informal sector and rural agricultural sector (Suryadarma et al., 2005). Using data from the Labour Force Survey, the authors show that the highest rise in employment was observed in the informal agricultural sector, which increased from 61 to 68 percent between 1997 and 1998. Similarly, Mukherjee (2002) reports that across neighbourhoods and villages on the Java island, layoffs during the economic crisis pushed many families out of the formal sector and into the informal sector.

⁴² WIEGO is a global network focused on securing livelihoods for the working poor, especially women, in the informal economy. Individual case studies are published at <http://wiego.org/informal-economy/worker-stories>.

⁴³ In his study, Wiebe (1996) moves away from the standard definition of underemployment. Under the standard definition, underemployment is defined as working less than 35 hours in a week. By this measure, some 49 percent of Indonesia's informal workers would be recognised as underemployed. But Wiebe introduces an additional element to the standard definition of underemployment, which includes those who work less than 35 hours but want more work. He argues that the standard work hour may be less applicable to an agricultural labourer than it is to a street vendor. If an agricultural labourer is satisfied with shorter working hours, then he or she must be counted among the fully employed (or in this particular study, they must be counted as income secured).

In the decade following the crisis, job creation in the formal sector has been slower. Using two data time points from the Indonesian Labour Force Survey, Aswicahyono et al. (2011) show that the record on formal employment and the index on regular-wage employment have declined between 2000 and 2005. At the same time, they note higher absorption in the informal sector. Within the categories of informal employment, it is unpaid family work and casual employment – the most vulnerable forms of informal employment – that have seen the highest rise (Dhanani et.al. 2009).

The rise in informal employment is associated with a decline in export-based factories, which were the primary source of formal jobs for the low-skilled during the economic boom of the 1980s and early 1990s. Furthermore, the substantial rise in the minimum wage in 2001 is associated with a loss in formal-sector jobs, which were compensated for by the expansion of the informal sector (Comola and Mello, 2011).⁴⁴ In estimating the overall impact of minimum-wage policies on poor Indonesians, Bird and Manning (2008) conclude that an increase in the minimum wage boosts net incomes for only 21 percent of poor households, while it result in net losses for an overwhelming 79 percent of poor households. This suggests that minimum wages, when set too high, harm the poor. More specifically, similar employment opportunities for the low-skilled and the poor that were previously associated with formal characteristics were now replaced with informal arrangements.

The review above suggests that one can expect to find a positive association between informal employment and poverty in Indonesia.

3.2.3 Macro level economy, employment and poverty

Bhagwati and Panagariya (2013) argue that only a growing economy has the capacity to create jobs for the population, since a growing economy is positively associated with investment and production. They also argue that a growing economy means the returns will allow the government to invest in essential social development sectors such as health and education, allowing for the growth of a healthy and educated population to meet the demand of the labour market. They conclude there must be economic growth, and that if this is

⁴⁴ In 2001, Indonesia went through a process of fiscal decentralisation which, among other things, devolved the minimum wage-setting responsibilities to the provincial governments. Devolution was followed by a sharp increase in the real value of the minimum wage to about 65 percent of the median wage in 2004.

present, the rest will follow. Their strong assumption that growth automatically translates into employment is contested through several studies reviewed in the subsequent paragraphs.

Arndt, Garcia, Tarp and Thurlow (2012) compare the effects of growth in country level GDP on poverty reduction between Vietnam and Mozambique, using data from 1997 and 2009.⁴⁵ They find that both countries recorded strong economic growth performance between the two years, but Vietnam recorded a much faster reduction in poverty (24 percent) than Mozambique (17 percent). Their analysis indicates that Vietnam outperformed Mozambique, despite both countries having similar resource endowments, since Vietnam's growth was being driven by progress in rural agriculture (where a large majority of its poor population live and work). In contrast, Mozambique's growth is being driven by expansion in the manufacturing sector, favouring the minority urbanites with manufacturing jobs and failing to reach a large proportion of the rural poor. In other words, growth in sectors deriving from the intensive use of unskilled labour will have a greater immediate impact on reducing the incidence of poverty than growth built on skilled labour.

In Indonesia, Suryahadi et al. (2009) find that an increase in sectoral GDP, particularly in the agriculture and services sectors is important for poverty reduction. Specifically using province-level data from 1984 to 2002, the authors find that the agricultural and service sectors are key to reducing poverty in rural areas, while GDP centred in the urban services sector is significantly associated with falling urban poverty levels. The empirical work of Suryahadi and colleagues suggests that the increasing productivity in agriculture and services – where the jobs are largely of an informal nature – have positive effects on falling poverty levels.

In summary, there is some evidence suggesting that a growing macro level economy has favoured the poor, even if jobs are created in sectors that cater for the informal workforce. This chapter therefore expects to find that: *Increasing GDP per person continues to be associated with falling levels of poverty, while holding the share of the informal workforce constant (Hypothesis 1).*

⁴⁵ Arndt et al., (2012) have used GDP *per capita* data, excluding oil and gas, as measure of economic growth.

3.3 Data, variables and methodology

3.3.1 Data

An important data source used in this chapter is the set of published provincial GDP statistics from the regional accounts data, which was made available by BPS upon request. In addition, information on population size by province was also provided by BPS upon request. This allowed for the computation of the *per capita* GDP by province and year. The variables on poverty and informal workforce were aggregated from the individual level information of the SUSENAS Core survey. The survey covers an annual sample composed of some 200,000 households and some one million individuals. The sample is representative up to the district level (*kabupaten / kotamadya*).

3.3.1.1 Unit of analysis: province

One of the purposes of this thesis is to understand macro-level factors that explain the geographical differences in poverty in Indonesia. Following this, the research question in this chapter is to what extent GDP per person matters for poverty at the regional level, while taking into account the shares of informal workforce in those regions. In other words, the analytical focus of this chapter is at the province level.

3.3.2 Variables

3.3.2.1 Independent variable 1: logged provincial GDP *per capita* (excluding oil and gas) at 2000 constant price

This chapter uses the provincial GDP per person measure as a proxy of regional economic affluence.^{46, 47} For the purpose of this study, a GDP per person (or *per capita*) measure is more accurate because a densely populated province may have high levels of GDP, but only when it is compared on a per-person basis will the measure reflect the true economic conditions experienced by people living in those provinces. The GDP per person measure was transformed into a natural logarithm (Ln) scale, where each increment represents a 100 percent increase in GDP per person. The transformed data allows for a scale that is more sensitive to differences when integers are small than when they are large. For example, the relative difference of an additional 5000 rupiah for a person with an income of 10,000 rupiah

⁴⁶ There are more than 40 indicators used to assess how well the economy is doing. Details on the type of indicators used to assess economic conditions are discussed in de Graaf and Batker (2011).

⁴⁷ The GDP measure applied in this chapter was adjusted for annual inflation by deflating the *current* annual value to the base year of 2000. This resulted in a *constant* GDP value, hence allowing for comparison over time.

is greater than for someone whose initial income is 100,000 rupiah. In other words, the more income individuals have, the less sensitive they are to small changes in income level.⁴⁸ In addition, this study finds that the model fits better when the GDP per person measure is transformed to a natural logarithm scale.⁴⁹

3.3.2.1.1 Time-lag GDP data

The assumption that the economy affects employment creation (whether informal or formal in nature) does not discount the fact that employment also affects GDP. For example, Bhagwati and Panagariya (2013) show that, in the case of India, a rapidly growing economy created more jobs and opportunities for the poor. In contrast, evidence from the Latin American region shows that an increase in the size of the informal sector negatively affects GDP (Loayza, 1996). Since this chapter focuses on the relationship between GDP, informal employment and poverty, there is some degree of assumption that the economy affects employment creation. Following this assumption, time-lag GDP data from the national accounts database was applied on the employment and poverty data aggregated from the SUSENAS Core. This means the GDP data from the previous year was applied to current year employment and poverty data. Table 3.1 presents a summary of the corresponding timeline of the GDP data and provincial level employment and poverty data aggregated from SUSENAS.

Table 3.1. The corresponding timeline for data aggregated from household survey (SUSENAS) and provincial GDP data

SUSENAS survey year	Month of SUSENAS survey	Provincial GDP data
2000	February	1999
2001	February	2000
2002	February	2001
2003	February	2002
2004	February	2003
2005	July	2004
2006	July	2005
2007	July	2006
2008	July	2007
2009	July	2008

⁴⁸ A graphic comparison published in *The Economist* on 25 November 2010 is an excellent piece of evidence in support of the use of logged scales: http://www.economist.com/blogs/dailychart/2010/11/daily_chart_1.

⁴⁹ GDP per person data by province and year is presented in Table C.1, Appendix.

There is a potential risk that the annual GDP data (1999–2008) applied in this chapter are highly correlated with each other. As such, there is a risk that this may bias estimates between GDP and poverty. One approach to address this problem would entail increasing the space between GDP data points to reduce the bias term (Eastwood and Lipton, 2002). As a test of robustness, additional analysis was carried out with GDP data that was adjusted for different time-lags: (1) GDP data lagged by two years; (2) GDP data averaged across three previous years; and (3) *changes* between GDP of current and the previous year (defined as growth). The outcome is discussed accordingly in the Results section. It is useful to mention at the outset that the strength of the association between GDP and poverty based on GDP data lagged by one year remained robust and hence the measure was consistently applied in all further analyses.

3.3.2.2 Independent variable 2: informal workforce

As a first step, the economic status of working-age individuals was identified using individual level data from SUSENAS. During the survey, individuals were asked several questions (e.g. whether they were employed, unemployed or inactive) to identify their economic status in the week prior to the survey. For individuals in employment, their employment statuses were taken into account. The categories of employment status were used to distinguish between formal and informal employment. The BPS defines formal and informal employment on the basis of employment status. Following their definition, Table 3.2 presents a summary of the distinction between formal and informal employment. Individual level outcomes were then aggregated to obtain the province level figures.⁵⁰

Table 3.2. Grouping informal and formal workers on the basis of employment statuses

Employment statuses	Formal employment	Informal employment
Regular employees	√	
Self-employed, with permanent workers	√	
Self-employed		√
Self-employed, with temporary/unpaid workers		√
Agriculture or non-agriculture casual workers		√
Unpaid / Family workers		√

⁵⁰ Share of informal workforce by province and year is presented in Table C.2, Appendix.

Table 3.3 provides a summary of the share of formal and informal workforce by the major regional islands. The working population is predominantly engaged in informal work. For example, Java may account for the lowest share of informal workforce across the regional islands, but more than half of the employed population in Java is composed of informal workers. The highest share of informal workforce is located in the eastern region of Nusa Tenggara, Maluku and Papua: some 75 percent of the economically active population here is engaged in informal work.

Table 3.3. Share of informal and formal workforce (15–65 years) by major regional island, Indonesia, 2000–2009

	Formal	Informal
Java	49%	51%
Sumatera	38%	62%
Kalimantan	36%	64%
Sulawesi	31%	69%
Nusa Tenggara, Maluku & Papua	25%	75%
Indonesia	37%	63%

3.3.2.3 Dependent variable 1: province-level BPS poverty

The construction of the poverty variable following the BPS methodology is discussed in detail in section 2.2 of Chapter 2. A summary version of the content in Chapter 2 is presented in this section.

Adjusted household consumption expenditure data as welfare indicator

As discussed in Chapter 2, consumption expenditure, when compared to income, is a better indicator of welfare. This is for two reasons. First, the survey data covers a more comprehensive household consumption expenditure data than income data. Second, the majority of the working population in Indonesia is engaged in informal employment, which suggests that incomes are more likely to be volatile. In such cases, current consumption as reflected by expenditure data is a good approximation of income with a volatile trend. Any temporary changes in income will have little effect in consumption expenditure, whereas only permanent changes in income level will have a large effect in consumption patterns. Following these arguments, household consumption expenditure data is seen as more viable as a welfare indicator than income data.

The household consumption expenditure data is a monthly sum spent on 15 aggregated food items (Table B.1, Appendix) and six aggregated non-food items (Table B.2, Appendix). More importantly, the household consumption expenditure data applied in this thesis was adjusted to match the consumption expenditure published from SUSENAS Module. It is useful to recall that the data on household consumption expenditure applied in this thesis is from the SUSENAS Core survey. Since the core survey covers aggregated categories of food and non-food items, the reported expenditure figure is lower in the core survey compared to data that is collected through the module survey. For example, consumption expenditure data based on the module survey covers 215 specific food items and 90 specific non-food items. When the questions are more detailed, respondents are likely to remember in more detail and to report higher spending (World Bank, 2014:18).

It is misleading to estimate poverty using what is essentially a ‘low’ consumption welfare data, as this will inherently result in high poverty rates. Hence, a practical approach was to adjust the mean household consumption expenditure data used in this thesis similar to the mean published from the Module for rural and urban areas by province and survey year. Province-level poverty figures estimated based on adjusted consumption expenditure data were similar to the official figures published by BPS.

Converting household-level welfare to individual-level data

Thus far, we have focused on household-level welfare but the ultimate goal in measuring poverty is to understand individual-level welfare. Following this the adjusted monthly household expenditure data was divided by household size to obtain the *per capita* welfare measure. By this approach, it is assumed that every member within the household has the same equivalent consumption. Additional analysis was undertaken in section 2.3.2 of Chapter 2 to test the robustness of the *per capita* approach. A comparison of the BPS poverty using various equivalence scales show that the application of the *per capita* scale is most reliable in measuring poverty in Indonesia.

Applying BPS provincial poverty lines to identify the poor from the non-poor

The adjusted consumption expenditure data allows us to understand the continuum welfare of each householder. However, it is only with poverty lines that we will be able to distinguish between the poor and non-poor. Poverty is computed using the BPS regional poverty lines that are anchored to the basic needs approach. The poverty lines are equated to the total costs required by each individual to meet their 2,100 calories per day, plus some allowance of non-food items, including clothing, education, health and housing. There is wide variation in the price of food and non-food items across the country (Miranti, 2010; Friedman, 2005), so poverty lines are only accurate when they are computed by rural and urban areas of each province. These are then adjusted spatially by indexing to prices in Jakarta, making them comparable over space (Miranti, 2010).

In sum, the BPS poverty measure identifies Indonesians as poor when their monthly *per capita* expenditure is less the provincial poverty line. It is important to note that the poverty lines computed by BPS are *per capita* lines. The same poverty line is applied on all individuals regardless of their age and gender, with factors that differentiates it limited to rural, urban and province. Naturally it made sense to apply these *per capita* province-level lines on consumption expenditure data that was also adjusted as proportional to household size. The final step in producing the province-level poverty estimates involved aggregating the share of poor people for each province at a given year from individual poverty profiles.⁵¹

3.3.2.4 Dependent variable 2: province-level \$1.25 a day poverty

In this chapter, the robustness of the relationship between GDP and poverty is tested using an alternative measure of poverty – the \$1.25 a day measure. The World Bank’s international \$1.25 a day measure is anchored to the living standards of the poorest 15 countries in the world. The technical procedure that was applied in constructing the international measure is discussed in Ravallion et al., (2009). Section 2.2.3.2 of Chapter 2 covers the approach that was applied in converting the adjusted monthly consumption expenditure data valued in Indonesian Rupiah to a per day data valued in U.S dollar (see page: 46). Converting the expenditure data is essential since the World Bank’s poverty line, that is, the \$1.25 a day represents a daily benchmark that is valued in U.S dollar.⁵²

⁵¹ Province-level poverty estimates following the BPS approach is presented by year in Table C.3, Appendix.

⁵² Province-level poverty estimates following the World Bank’s \$1.25 a day approach is presented by year in Table C.4, Appendix.

3.3.3 Model

It is possible that unmeasured time-invariant factors may result in a biased estimation of the observed association between GDP and poverty.^{53, 54} To address this issue, this chapter models the relationship between GDP and poverty using a fixed effects (FE) and random effects (RE) approach on a panel of Indonesian provinces.⁵⁵

Previous studies that estimated the effects of growth on poverty reduction using a fixed effects model (Miranti, 2010) or a first differences estimation (Ravallion and Chen, 1997) have included survey year dummies as a control variable. It is useful to note that, in these studies, aggregate affluence is defined using mean consumption expenditure from household survey, and the gap between each data point ranges anywhere between two to ten years. Survey years are thus included as a control to represent changes in macroeconomic conditions (macro-level unmeasured time-varying factors), which household surveys are less likely to pick up. This chapter, however, has applied annual GDP per person as a proxy of aggregate affluence. GDP indicator itself is sensitive to macro-level time-varying factors such as changes in trade, mortality rates, fertility rates, and illiteracy, to name but a few. For this study at least, therefore, it is of lower relevance to include the survey year as a control variable.

Following the discussion above, the full model specification is as follows:

$$\text{POVERTY}_{pt} = \alpha_p + \beta_1 \ln \text{GDP}_{pt-1} + \beta_2 \text{INFORMAL}_{pt} + \gamma_p + \varepsilon_{pt}$$

⁵³ In normal linear model such as OLS, all unmeasured factors should be captured by the error term. However, if the unmeasured factors are correlated with predictor variables such as GDP *per capita*, then the assumption of OLS that error is uncorrelated with the predictor variables would be violated. This is among the reasons why it is inadvisable to model the association between GDP and poverty using the OLS approach.

⁵⁴ The discussions on appropriate models for coping with omitted variable bias and their interpretation is drawn from three sources: Snijders and Bosker (2012), Bollen and Brand (2008, 2010) and Treiman, (2009).

⁵⁵ As discussed in Bollen and Brand (2008, 2010), an advantage of the RE model is that it permits the inclusion of *measured* time-invariant variables. However, the FE model does not permit the inclusion of *measured* time-invariant variables. This particular aspect usually differentiates between the RE and the FE equation. For the purpose of investigating the research question raised in this chapter, however, it was not relevant to include any *measured* time-invariant variables in the RE models. Hence, the equation for the RE model and FE model are similar. There is, however, a difference in the interpretation of the *unmeasured* time-invariant variables across both models: in the RE model, the *unmeasured* time-invariant variables are assumed to be uncorrelated with the measured time-varying variables, while in the FE model they are allowed to correlate (Mundlak, 1978 cited in Bollen and Brand, 2008).

The notations for the expressions are:

p is province

t is the survey year

α is the province specific intercept

γ is the unmeasured time-invariant factor for province p

ε is the error term that includes unmeasured factors

POVERTY is poverty (%) in province p at survey year t

INFORMAL is the share of the working population engaged in informal employment.

GDP (Indonesian rupiah, 2000 prices) is annual non-oil and gas income per person; GDP between 2000 and 2009 is $t - 1$

Different sets of GDP specifications are also applied in the robustness analyses. This includes:

GDP between 2000 and 2009 is $t - 2$ (for GDP data lagged by two years)

GDP between 2000 and 2009 is $\frac{(t-1)+(t-2)+(t-3)}{3}$ (for GDP data averaged across three previous years)

GDP between 2000 and 2009 is $\frac{(t-1)-(t-2)}{t-2} \times 100$ (for GDP growth)

The FE model assumes that the γ represents a set of time-invariant factors that are purged by the model by differencing over the panel of survey years for each province p. The RE model assumes that each γ is a normally distributed random variable that is uncorrelated to all other covariates in the model, as well as to the errors (ε_{pt}), which is a strong assumption (Treiman, 2009; Bollen and Brand, 2008). Hausman tests were carried out to determine whether the γ_p independence is supported, in other words whether RE models performed adequately. The results indicate that the hypothesis of similarity in coefficients is rejected ($p=0.00$), and hence only the FE estimates are reported.

The estimation of the models is based on an unbalanced panel of provinces. This is because surveys were not conducted in the provinces of Aceh, Maluku and Papua due to political and communal violence in 2000 and 2002. The panel sample consisted of 33 provinces that summed to 320 units of observation across a 10-year period (2000–2009).

3.4 Results

3.4.1 Bivariate associations

This section explores the bivariate trends between macro-level affluence (GDP), informal workforce and poverty by pooling 320 units of observations from 33 provinces into a scatterplot. Pooling all observations into a single scatterplot gives a view of the general trend. In addition, provinces that do not conform to the general trend (the outliers) are observed in individual scatterplots.

3.4.1.1 Is a higher GDP associated with lower poverty?

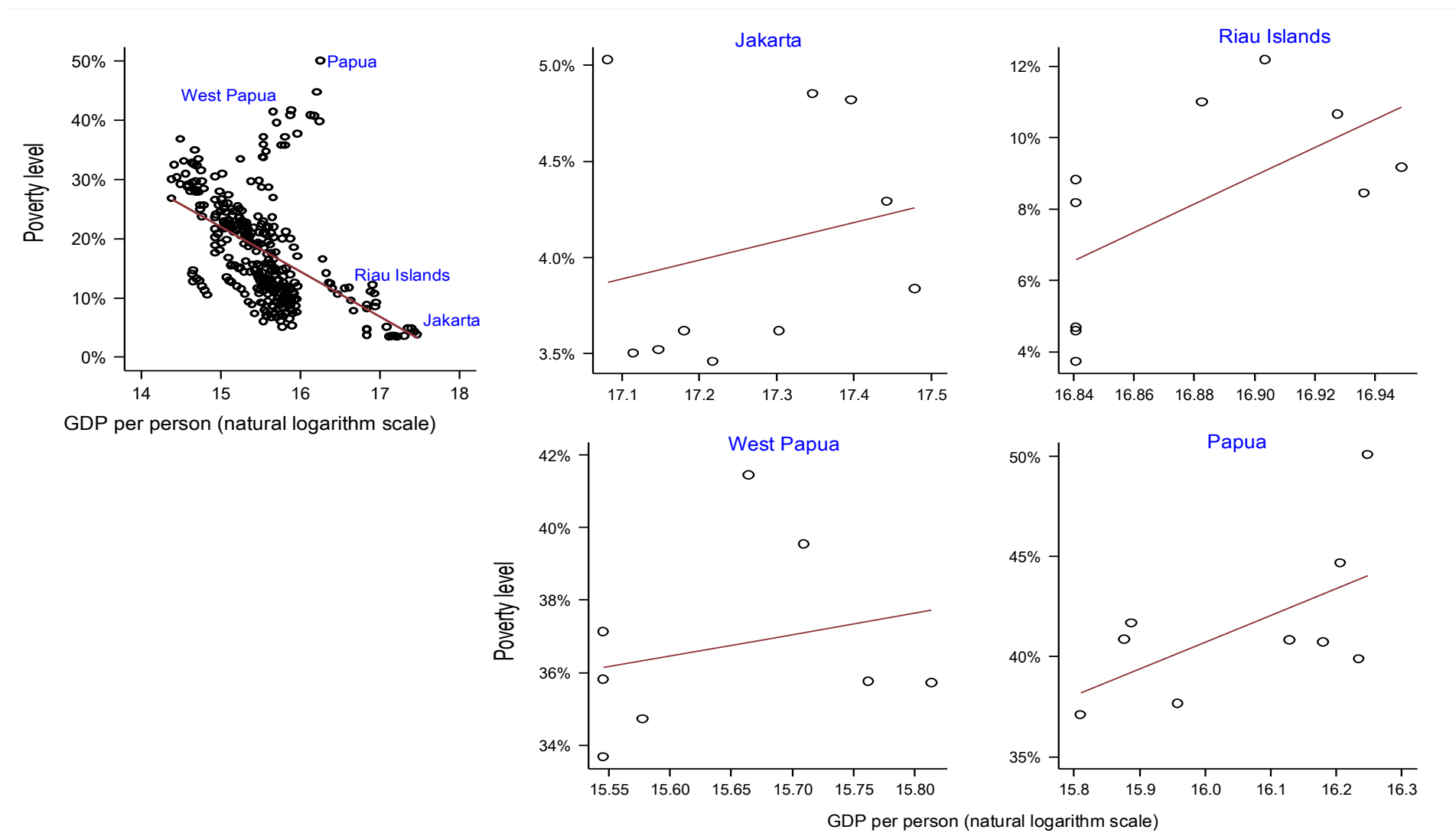
Figure 3.1 show the relationship between province-level GDP⁵⁶ and poverty measured using the BPS approach. The general trend (2000–2009) in Indonesia suggests a negative relationship between regional GDP and poverty. In other words, higher GDP is linked with lower levels of poverty. Province-specific analysis indicates that four of the 33 provinces do not conform to the general trend. These are: Jakarta, Riau Islands, West Papua and Papua (individual scatterplots, Figure 3.1). In these provinces, GDP show a positive relationship with poverty.

Jakarta and Riau Islands are provinces with the highest record of GDP per person in Indonesia. Poverty in both provinces are also among the lowest in Indonesia. A closer look into the data show that GDP and poverty increased between 2005 and 2007. This period is marked by rises in rice and fuel prices which impacted the poorest Indonesians, particularly in the urban centres (McCulloch, 2008).

Papua and West Papua account for high levels of GDP, but it is in these provinces that poverty is also most prevalent. The GDP of both provinces is driven by the copper and gold mining industry. There is evidence to indicate that Papuans do not benefit greatly from the income generated by the region's natural resources (The Guardian, 2 November 2016). Opportunities for mining sector employment in this province are limited, with most residents continuing to depend on agriculture (Miranti, 2011).

⁵⁶ Henceforth, we refer the natural logarithm of regional GDP per person as GDP.

Figure 3.1. The relationship between GDP per person (natural logarithm scale) and poverty (BPS measure), Indonesia, 2000–2009



3.4.1.2 Is a higher GDP associated with a lower share of informal workforce?

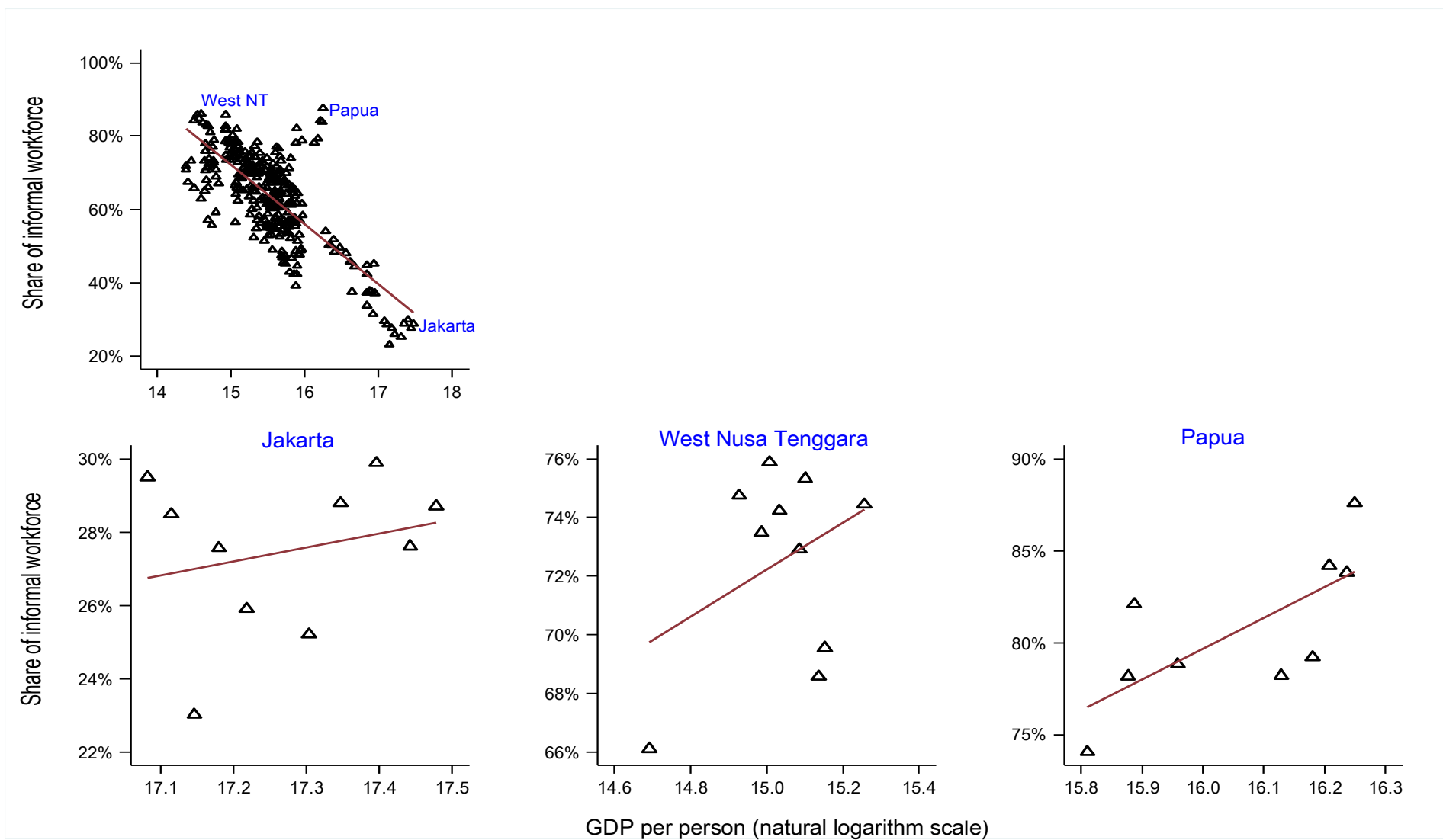
There is some consensus that a rapidly growing economy is associated with more jobs and opportunities for the poor (Bhagwati and Panagariya, 2013; Dhanani et al., 2009; Suryahadi et al., 2009), but discussion rarely covers the nature of those jobs. Figure 3.2 explores the relationship between regional GDP and the share of the informal workforce. The general trend suggests that higher levels of regional GDP are linked with lower levels of informal workforce. In other words, GDP-rich provinces are less likely to encourage the growth of an informal workforce. However, three provinces – Jakarta, West Nusa Tenggara and Papua show a different trend. In these provinces, higher levels of GDP are associated with higher share of informal workforce.

In general, Jakarta has the lowest share of informal workforce compared to all other provinces in Indonesia. Between 1986 and 1996, most of the growth in industrial and financial services sector occurred in large enterprises located in Jakarta and in the immediate neighbouring provinces (Aswicahyono et al., 2011). However, in the period following the 1997–98 financial crisis, most of these jobs have shifted from larger to smaller enterprises. This means that the nature of these jobs has transitioned from formal to informal and from decent to inferior work benefits. In other words, the share of informal workers in the country's capital has been increasing along with a slow growing economy.

GDP-rich Papua has some 80 percent of its workforce engaged as informal workers, where 8 out of 10 informal workers are engaged in agricultural work. This further affirms that Papua's mineral-driven-GDP-output has a smaller impact on local employment and income spin-offs.

Similarly, West Nusa Tenggara – located in the eastern region of the country – is the second largest gold producer in the world (after the region of Papua). Yet some 73 percent of the workforce in this province is engaged as informal workers. The large majority of these workers – 68 percent – are engaged in agricultural work.

Figure 3.2. The relationship between GDP per person and informal employment, Indonesia, 2000–2009

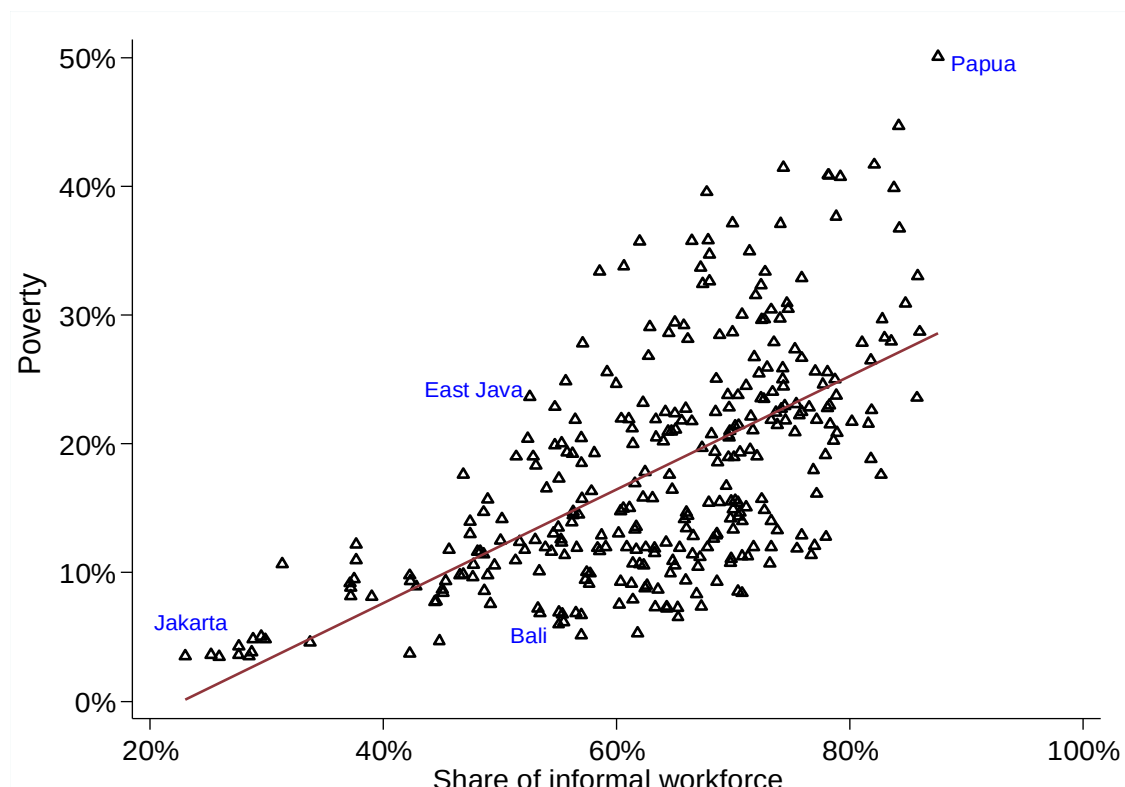


3.4.1.3 Is poverty more prevalent where there is a higher share of informal workforce?

Figure 3.3 shows the relationship between the regional share of informal workforce and BPS poverty. The general trend suggests a positive relationship between informal workforce and poverty. This suggests that poverty is higher in provinces with a higher share of informal workforce. The general trend is in line with case studies by WIEGO that shows household that rely primarily on income from informal employment face higher risk of poverty. Analyses by individual provinces also conform to the general trend.

However, Bali gives rise to some interesting observations. Despite having a comparable GDP to that of many other provinces (such as East Java), poverty is lower in Bali; yet the share of the informal workforce is so much higher than in other provinces. This suggests that the general perception of a positive relationship between informal work and poverty may be weak in places like Bali, where the market created by international tourism may encourage entrepreneurial Indonesians to set up informal businesses to cater for tourists. Small scale traders, therefore – a main source of informal employment in Indonesia – are potentially better off in places like Bali than elsewhere in the archipelago.

Figure 3.3. The relationship between informal employment and poverty (BPS measure), Indonesia, 2000–2009



3.4.2 Analyses

Thus far, the bivariate analysis has confirmed three important points for the period under study (2000–2009). First, a higher GDP is associated with lower poverty. Second, a higher GDP is associated with lower shares of informal workers. Third, a higher share of informal workforce is associated with higher poverty. The bivariate analysis has allowed us to understand the direction of the association between GDP, the informal workforce and poverty in Indonesia. The following section investigates whether the negative association between GDP and poverty persist once observed, and unobserved regional differences are taken into account in fixed effects regression analyses.

Hypothesis 1: Increasing GDP per person continues to be associated with falling levels of poverty, while holding the share of the informal workforce constant.

3.4.2.1 The association between of GDP and BPS poverty

Table 3.4 (Models 1–2) reports the results for macro-level predictors of poverty for the FE model. It is useful to bear in mind that the interpretation of the coefficient associated with the GDP and poverty is not straightforward, since the variable GDP per person, a proxy of the macro-level economy, has been log transformed. In the context of this chapter, the expected change in poverty associated with a 10 percent increase in GDP is: $\beta_1 * \log ([100 + 10])/100$. In other words, $0.095\beta_1$ is the expected change in poverty when GDP increases by 10 percent.⁵⁷

Model 1 (Table 3.4) is the baseline model that assumes the relationship between GDP and poverty is similar across major regional islands and time periods. The results in Model 1 show that increasing levels of GDP is significantly associated with falling levels of poverty.

Model 2 (following the full model specification) introduces the share of the informal workforce. A 10 percent increase in the share of informal workforce is significantly associated with a 1.5 percent increase in poverty. The inclusion of the informal workforce in Model 2 reduces the coefficient of the GDP but only marginally since the value is logged.

⁵⁷ Benoit (2011) provides a detailed discussion on interpreting linear regression models with logarithmic transformations.

The results in Model 2 confirm the hypothesis of this chapter: increasing GDP continues to be associated with falling levels of poverty, holding the share of informal workforce constant. The general trend shows that a growing GDP is associated with Indonesians moving above the poverty line, but it should be noted that the size of the association is very small. Results from Model 2 suggest that on average, a 10 percent increase in GDP is proportionately associated with a 0.8 percent fall in poverty $[0.095*(-8.37)]$.

Table 3.4. Fixed effects (FE) estimates predicting the association between GDP and poverty, Indonesia, 2000–2009

	Model 1	Model 2
Ln(GDP) per person	-11.17*** (1.29)	-8.37*** (1.46)
Share of informal workers		0.15*** (0.04)
Constant	191.22*** (20.01)	138.19*** (24.10)
N	320	320

Note: *, ** and *** denote significance at the 5%, 1% and 0.1% level.

GDP data adjusted for different time-lags

The results for Model 1 and 2 are based on GDP data from the previous year that was applied to current year employment and poverty data. However there is concern that the estimates of the association between GDP and poverty may be biased because the annual GDP data (1999–2008) may be highly correlated with each other (discussed in section 3.3.2.1.1). As a test of robustness, additional analysis was carried out with GDP data that was adjusted for different time-lags.

First, a two-year time-lag GDP *per capita* data was applied on employment and poverty data. The difficulty in obtaining province-level GDP data for 1998 meant poverty data for 2000 was not included in the analysis. This meant GDP data from 1999 was applied to employment and poverty data of 2001, with the same time-lag applied for data of subsequent years. To ensure comparability, Model 2 was re-estimated by not including employment and poverty data for 2000 (Table C.5, Model 2a, Appendix). Results based on the re-estimated one-year time-lag model and two year time-lag model was very similar (Table C.5, Model 2b, Appendix). In the re-estimated model, a 10 percent increase in GDP is proportionately associated with a 0.79 percent fall in poverty $[0.095*(-8.29)]$; while in the two year time-lag

model, a 10 percent increase in GDP is proportionately associated with a 0.82 percent fall in poverty [$0.095*(-8.69)$]. The both associations are statistically significant at 0.1 percent level.

Second, GDP *per capita* data averaged across three previous years was applied on current employment and poverty data. The results (Table C.5, Model 2c, Appendix) indicate that a 10 percent increase in average GDP is proportionately associated with a 0.9 percent fall in poverty [$0.095*(-9.58)$].

In sum, there is evidence to indicate that increasing the space between GDP data points result in very similar estimates of the association between GDP and poverty. The findings across the different time lags suggest some degree of robustness to the results presented in Model 2. Thus, in subsequent analytical sections, we pursue with the GDP data that was lagged by one-year.

Thus far, our estimation has been on levels of GDP and poverty. To test the robustness of results in Model 2, estimation in differences was also carried out. In this approach, *changes* in GDP per person between 2000 and 1999 (defined as GDP growth) were applied to employment and poverty data of 2001. The results indicate that a 10 percent growth in GDP is proportionately associated with reducing poverty by 0.5 percent (Table C.6, Model 2d, Appendix). The estimation based in differences is smaller and the statistical significance is weaker compared to the estimation in levels that is observed in Model 2. As a comparison point, what is important is that the direction of the association has remained stable across the different sets of estimates. This chapter will not be pursuing further on estimation in differences given that the interest of this chapter is on levels.

3.4.2.2 The association between GDP and \$1.25 a day poverty

What, then, does the association between GDP and poverty look like when poverty is measured using an alternative measure of poverty? Holding the informal workforce to be constant, Model 4 (Table 3.5) show that a 10 percent increase in GDP is proportionately associated with a 7 percent fall in poverty, measured using the \$1.25 a day benchmark. In other words, GDP has been significantly *more* poverty-reducing by the \$1.25 a day measure than by the BPS measure.

To understand this particular trend, it is useful to recall the key difference between the BPS poverty and the \$1.25 a day poverty presented in Chapter 2 of this thesis. The \$1.25 a day poverty line represents an average increase of \$0.17 cents from the BPS regional poverty line. As a result, an additional 33 million Indonesians were identified living below the \$1.25 a day poverty line compared to the BPS line throughout the period under study. However, a closer look at poverty over time shows that the substantial gap between the BPS and the \$1.25 a day measure is driven by poverty trends in the early 2000s (illustrated in Figure 2.6 of Chapter 2). In the latter part of the 2000s, however, poverty trends were converging between both measures of poverty. This suggests that, over time, poverty measured using the \$1.25 a day line reduced much faster than poverty measured using the BPS line. It is thus not surprising to see a stronger negative association between GDP and \$1.25 a day poverty.

Table 3.5. Fixed effects (FE) estimates predicting the association between GDP and \$1.25 a day poverty, Indonesia, 2000–2009

	Model 3	Model 4
Ln(GDP) per person	-85.59*** (3.83)	-73.11*** (4.21)
Share of informal workers		0.67*** (0.12)
Constant	1361.36*** (59.37)	1125.19*** (69.23)
N	320	320

Note: *, ** and *** denote significance at the 5%, 1% and 0.1% level.

A comparison of the results between the BPS poverty measure and the \$1.25 a day measure also reveals an important issue: the poorest are not associated with an increasing GDP. The BPS poverty measure applies a lower regional poverty line than the \$1.25 a day poverty line, so the BPS measure is likely to capture the poorest of the poor. Given that the negative association between GDP and BPS poverty are much smaller than what is observed for the \$1.25 a day poverty, this suggest that those at the very bottom of the welfare continuum have not benefitted from a growing GDP.

It is also useful to note that the positive association between the informal workforce and poverty are much larger when the \$1.25 a day measure is applied. A 10 percent increase in the share of the informal workforce is significantly associated with an almost 7 percent increase in \$1.25 a day poverty. In contrast, the association is much smaller when poverty is measured using the BPS approach (refer to Model 2, Table 3.4). The GDP coefficients between Model 3 and Model 4 reduced marginally when the informal workforce was included in Model 4.

3.4.2.3 The association between GDP and poverty by major regional islands

The results of the fixed effects estimate for each regional model are presented in Table 3.6 (Model 5-9). Each region was modelled individually to get a clearer sense of the regional trend. The regional islands of Indonesia show a unifying trend: increasing GDP is associated with falling levels of poverty (BPS measure). The negative association between GDP and poverty is most notable for the island of Kalimantan, where a 10 percent increase in GDP is proportionately associated with a 2.3 percent fall in poverty (Table 3.6, Model 7). The association is statistically significant. In this regional island, the association between the informal workforce and poverty are negative, though the association lacks significance. The results seem to suggest that provinces within this regional island with a higher share of informal workers are not too worse off than provinces with a lower share of informal workers.

In contrast, GDP is *least* poverty reducing in the eastern islands of Nusa Tenggara, Maluku and Papua (Table 3.6, Model 9). Furthermore, the negative association between GDP and poverty lacks significance. This suggests that increasing GDP has done very little for the poor in the poorest region of the country, where the share of the informal workforce is much more prevalent (some 75 percent of the working population are engaged as informal workers in the eastern region). An increasing share of informal workforce is also significantly associated with increase in poverty. A 10 percent increase in the share of informal workforce is associated with a near 5 percent increase in poverty.

The regional analysis was recomputed using \$1.25 a day poverty as the dependent variable (Table C.7, Appendix). Increasing GDP was, again, *most* poverty reducing in Kalimantan (a 10 percent increase in GDP is proportionately associated with a 13 percent reduction in \$1.25 a day poverty) and *least* poverty reducing in the easternmost islands (a 10 percent increase in GDP is proportionately associated with a 4.3 percent decline in \$1.25 a day poverty).

In sum, the strength of the association between GDP and poverty differs when poverty is measured differently. The direction and regional trend of the association, however, is similar across the different measures of poverty.

It is interesting to note the much stronger positive association between GDP and falling levels of poverty in the Kalimantan region. In addition, the inclusion of the share of informal workers in Model 7 further strengthened the association between rising GDP and falling poverty. This suggest that to some degree informal employment has been favourable for poverty reduction in the region. A closer look into the data reveals that the region has experienced a consistent rise in GDP through the 2000s. All four provinces (East, South, West and Central Kalimantan) in the Kalimantan region experienced positive economic growth in the period between 2000 and 2009. In addition, the fastest rate of poverty reduction between 2000 and 2009 was observed for the province of West Kalimantan, where poverty on average declined by 2 percent per year. In all other three provinces, poverty on average declined by close to 1 percent per year. The favourable macro-economy climate may relate to the regions' greater connectivity with Malaysia, Brunei and Singapore (Miranti, 2011). This to some extent may be favouring informal workers who are employed in industries sponsored by neighbouring countries, hence, improving the general living standards in Kalimantan.

Table 3.6. Fixed effects (FE) estimates predicting the association between GDP and BPS poverty, by major regional islands, Indonesia, 2000–2009

	Model 5: Java		Model 6: Sumatera		Model 7: Kalimantan		Model 8: Sulawesi		Model 9: NT, Maluku & Papua	
Ln(GDP) per person	-12.65*** (2.53)	-11.55*** (2.62)	-11.28*** (2.43)	-10.81** (3.29)	-23.92*** (3.87)	-30.83*** (6.48)	-10.20*** (2.04)	-7.86** (2.50)	-2.22 (3.78)	-4.55 (3.15)
Share of informal workforce		0.12 (0.09)		0.02 (0.08)		-0.23 (0.18)		0.09 (0.08)		0.50*** (0.10)
Constant	213.58*** (39.89)	189.96*** (42.83)	192.12*** (37.96)	183.84** (54.61)	390.56*** (61.34)	514.97*** (111.99)	174.23*** (30.35)	132.34** (47.02)	63.45 (57.09)	61.06 (47.06)
N	70		97		40		60		53	

Note: *, ** and *** denote significance at the 5%, 1% and 0.1% level.

3.4.2.4 The association between GDP and poverty by time period

A comparative analysis across time periods was undertaken to determine whether the findings of a negative association between GDP and poverty using the FE approach is driven by trends in a particular time period. The grouping of the time periods is based on the general microeconomic climate of the country throughout the 2000s. The first period (2000–2002) represents the immediate period following the economic crisis of 1997–1998. The second period (2003–2006) was characterised by average levels of growth and rises in fuel and rice prices (McCulloch, 2008). The third period (2006–2009) was marked by stable economic growth and falling levels of poverty across all provinces.

In the first period (2000–2002, Model 10), the association between GDP and poverty was negative and lacked significance. The first period was characterised by low levels of GDP, but poverty continued to fall in most provinces following its peak in 1997 (Suryahadi et al., 2003). In a few provinces, however – notably Yogyakarta, West Kalimantan and Maluku – poverty in the early 2000s remained comparable to levels observed during the economic crisis. The trend in these provinces may explain why GDP was *less* poverty reducing in the first period.

Table 3.7. Fixed effects (FE) estimates predicting the relationship between GDP and poverty (BPS measure), by time period, Indonesia, 2000–2009

	Model 10: 2002–2003	Model 11: 2003–2005	Model 12: 2006–2009
Ln(GDP) per person	-4.02 (9.91)	2.48 (2.16)	-25.50*** (2.30)
Share of informal workers	0.15 (0.13)	0.05 (0.04)	0.04 (0.04)
Constant	71.30 (152.60)	-23.63 (34.39)	412.34*** (35.99)
N	90	131	99

Note: *, ** and *** denote significance at the 5%, 1% and 0.1% level.

In the second period (2003–2005, Model 11), the association between GDP and poverty were positive, but lacked significance. The result is not really surprising, since the period was marked by an increase in domestic rice prices and the removal of fuel subsidies, which impacted on the poorest Indonesians. The unfavourable macro-economic policies did not help to reduce poverty.

The third period (2007–2009) shows that an increasing GDP is significantly associated with falling levels of poverty. Results from Model 12 suggest that a 10 percent increase in GDP is proportionately associated with a 2.4 percent fall in poverty between 2007 and 2009. By disaggregating the data by major time period, it becomes evident that the overall negative association between GDP and poverty is being driven by trends originating later in the 2000s. More importantly, increasing GDP is significantly associated with falling levels of poverty during a period where the share of informal workforce has remained persistently high.

The time period analysis was recomputed using \$1.25 a day poverty as the dependent variable (Table C.8, Appendix). Increasing GDP is significantly associated with falling levels of \$1.25 a day poverty across all three major time period. Increasing GDP was *most* poverty reducing in the later period where a 10 percent increase in GDP is proportionately associated with a 9 percent reduction in \$1.25 a day poverty between 2006 and 2009. The results is to some degree in line with the trend that was observed using the BPS poverty measure.

3.5 Discussion

There are four major findings of this chapter.

The first finding is that Indonesia's positive regional macroeconomic condition is associated with falling levels of regional poverty. The association continues to remain robust even after taking the varying levels of informal workforce into account. In other words, increasing GDP has lifted people out of poverty in an environment where the share of informal employment is considered high by most middle-income country standard. The negative association between GDP and BPS poverty, however, is small: a 10 percent increase in GDP is proportionately associated with reducing poverty by only 0.8 percent. Longer time-lagged GDP data do not alter the findings very much. This leads us to the second finding when an alternative measure of poverty is applied.

The second finding highlights the robustness of the negative association between GDP and poverty by the \$1.25 a day poverty measure. More importantly, the association is much stronger by the alternative measure of poverty: a 10 percent increase in regional GDP is proportionately associated with a 7 percent fall in \$1.25 a day poverty, compared to 0.8 percent by BPS measure. Since BPS poverty lines are lower than the \$1.25 a day poverty line, the BPS measure is more likely to capture the poorest of the poor. The findings of a much smaller negative association between GDP and BPS poverty suggest that those at the very bottom of the welfare continuum have benefitted less from a growing GDP. In other words, a rising tide (GDP) is associated with lifting the boats (poor people) but not the neediest boats (poorest of the poor).

Third, increasing GDP has significant association with falling levels of poverty in the regional island of Kalimantan, where average poverty is the lowest (12 percent). It is assumed that the greater proximity and connectivity between Kalimantan with Malaysia, Brunei and Singapore may explain the regions favourable association between economic prosperity and poverty reduction, as well as the positive association between informal employment and poverty reduction.

In contrast, increasing GDP has almost no relationship on poverty in the deprived eastern islands of Nusa Tenggara, Maluku and Papua (where average poverty is 30 percent). In other words, increasing GDP has a less of a poverty-reducing relationship in poorer regions of the country than in developed regions of the country, suggesting that a rising GDP is not reaching the poorest of the poor. Consequently, as shown in the regional FE model, it is in the poorest region where the relationship between informal workforce and poverty is significantly positive. Agriculture remains the single biggest source of employment for the population living in the easternmost region of the country. A significant majority of them are located in lower-productivity and lower-wage agricultural jobs. In addition, the eastern islands are disadvantaged both by their distance from the main centres of economic activity and by inadequate infrastructure (Miranti, 2011).

Fourth, the negative association between GDP and poverty is evident in the later part of the 2000s, particularly between 2007 and 2009. During this period, increasing GDP is significantly associated with reducing poverty despite the prevailing share of informal workforce. The period analyses also revealed that GDP mattered less for poverty during macro-level crises that impacted the poor directly, such as of rice and fuel price rises.

The findings of this chapter conform to the previous findings from Indonesia: a growing economy matters for poverty reduction. Miranti (2010) found that official poverty reduced by 24 percent for every 10 percent increase in province-level mean consumption expenditure (obtained from household survey) between 1984 and 2002. Balisacan et al. (2003) showed that a 10 percent increase in district-level consumption expenditure raised the living standards of the bottom 20 percent by 7 percent between 1990 and 1996. This chapter has shown that for every 10 percent increase in province-level GDP, official poverty reduced by less than 1 percent between 2000 and 2009. The much smaller effect found in this study may be attributed to two factors.

First, the measure of the economy used in this chapter is non-oil and gas GDP per person valued in Indonesian Rupiah, drawn from the national accounts database. In previous studies economic growth is defined as changes in aggregate household consumption expenditure estimated from household surveys. Given that poverty is also constructed from household consumption data, it is not surprising to note a stronger association between ‘growth’ and poverty in the previous studies. Second, this chapter covers a later time period than the two previous studies.

3.6 Conclusion

This chapter concludes that, in the context of Indonesia, increasing GDP per person is associated with falling levels of poverty despite the fact that a significant share of the working population is engaged as informal workers. Increasing GDP has, however, done very little to lift the poorest of the poor out of poverty. Those living in the poorest regions of the country are associated with the least benefit from an increasing GDP. In addition, a rising GDP has had a very small impact on those living at lower poverty lines, that is, those at the very bottom of the welfare continuum.

There is some evidence to indicate that the share of the informal workforce in Indonesia is offsetting the positive association between GDP and falling levels of poverty, but these are very minimal. This is good news for a nation that has a prevailing share of informal workforce, and which has seen a minimal rise in the share of formal employment since the 1997–1998 financial crisis.

Chapter 4

Exploring the Association between Educational Attainment, Employment Status and Poverty in Indonesia, 2000-2009

4.1 Introduction

This chapter examines the importance of an individuals' educational level on poverty in association with their employment status. It examines to what extent the relationship varies across a time period and the major regions of the Indonesian archipelago that are known for its heterogeneous economic development. Surprisingly, given the importance of education for socioeconomic reproduction and mobility, very limited research exists at the micro level on this topic in the context of Indonesia.

There is wide agreement that education enables people to escape from poverty. The explanation is that education makes it more likely for men and women not just to be employed, but to hold jobs that are more secure and that provide decent pay and good working conditions (UNESCO, 2014:148), hence making it unlikely for them to fall into poverty. But how does a country such as Indonesia fare by this argument when a large pool of its workforce comes with minimum levels of education? Interestingly, it is one of the few countries that stand tall in the history of poverty reduction. More importantly, the largest reduction of poverty was observed among those lacking formal education.

Between 1984 and 1996, Indonesia's official poverty level dropped from 30 to 18 percent, an average reduction of one-percentage-point-per-year.⁵⁸ A similar trend was also observed by alternative measures of poverty in the same time period. Indonesians living on less than \$1.25 per day fell from 63 to 43 percent – a reduction of 20 percent in a span of 12 years. Such substantial reduction in the number of poor people is only possible if it occurred primarily among those occupying the lowest tiers of educational qualification. For example, between 1993 and 1996, poverty reduced from 42 to 30 percent among those with no formal education, from 32 to 21 percent among those with primary schooling qualification while it

⁵⁸ These poverty figures are based on the work by Miranti (2010). Since 1999, BPS estimates poverty using a revised poverty line methodology (Priebe, 2011a). BPS also corrected its 1996 and 1998 estimate based on the revised methodology. Miranti recomputed the pre-1996 poverty figures using the revised poverty line methodology, hence making it comparable over time.

dropped from 8 to 5 percent among those with higher education.⁵⁹ In other words, the largest reduction in poverty levels occurred among those lacking formal education, followed by among those with the some five years or less of formal schooling.

The substantial drop in poverty among those with low levels of education is accredited largely to the expansion of the manufacturing, construction and services sectors. These sectors opened jobs which economists would term as ‘jobs at the lower end of the supply chain’. In other words, these jobs did not require high levels of education, just minimum levels of training that made individuals employable. However two important transitions took place during this phase of industrialisation. Firstly, a significant number of poorly educated individuals shifted from the largely informal agriculture sector to the mostly formal manufacturing and construction sectors (Agrawal, 1996). Secondly, wage employment was more common in these sectors (Aswicahyono, Hill and Narjoko, 2011). Subsequently, the real earnings of employees with primary education and those lacking formal education rose, hence accounting for a large reduction in poverty among those with lower tiers of educational qualification.⁶⁰ In other words, Indonesia’s economic growth of the 1980s and early 1990s was centered on providing decent employment for a large pool of the labor force that had low levels of education.

However the economic crisis of 1997–1998 reversed these remarkable trends. More Indonesians than before are self-employed or working for their families without pay and salaried workers were in fact a minority (Dhanani, Islam and Chowdhury, 2009:22). In particular, the increase in informal employment is more notable among those with secondary education, as well as among women. For example, between 2000 and 2009, informal employment increased from 90 to 93 percent among those with no formal education. In the same time period, informal employment increased from 65 to 71 percent for those with lower secondary education and from 36 to 49 percent for those with upper secondary qualification.⁶¹

⁵⁹ The figures were computed using data from the Indonesian Family Life Survey (IFLS) 1993 and 1997.

⁶⁰ For an example, between 1989 and 1997, the average real earnings grew on average by 5% per year for those with no formal schooling, 6% for those with incomplete and completed primary education, 4% for those who completed lower secondary education, 5% for those who completed upper secondary and 4% for those with tertiary education. These numbers were obtained from Table 9.13, presented in Islam (2006:345).

⁶¹ The figures were computed using SUSENAS 2000 and 2009.

In the post-crisis period, aggregate unemployment rates have remained reasonably low and stable during this period. This may seem to suggest that individuals opted for informal work or inactivity than unemployment. However, there is also evidence to suggest that the unemployment trend is largely associated among the minority tertiary graduates who can afford to remain unemployed due to their well-to-do family background (Dhanani et al., 2009). Furthermore, there is also the case of individuals who faced difficulties in finding employment, eventually giving up hope and becoming *discouraged* (Suryadarma, Suryahadi and Sumarto, 2005). In Indonesia's national surveys, individuals who do not *actively* look for jobs tend to be identified as economically inactive even if their joblessness status is because of the discouraging prospects of the employment market. Subsequently, an overwhelming one third of the working age Indonesians are identified as economically inactive - but there is no literature that have studied the educational characteristics or the economic well-being of this particular group.

In sum, it is less clear how individuals at a given level of education fare by measure of poverty given the present employment structure. One assumption is that those occupying the lowest tiers of educational qualification are more likely engaged in informal employment. As such, the disadvantageous educational and work background may accentuate their poverty experience. To discover what actually occurs, this chapter explores whether those lacking education face disadvantages in the labor market and their association with the risk of poverty. Thus, the first research question is *to what extent the association between the individual's level of education and poverty varies with employment status?*

The negative association between the less educated and poverty may be stronger for those living in less developed than developed regions of the archipelago. This is for three reasons. First, poorly educated individuals are predominantly found or located in least developed areas of a country.⁶² Second, those who lack formal education and living in less developed areas are less likely to migrate for employment opportunities compared to their associates with more years of schooling (Kong and Effendi, 2011).

⁶² Schools in less developed regions of Indonesia are characterised by higher dropout rates, poorer schooling facilities and higher rates of teacher absenteeism than schools in better off areas (Kristiansen and Pratikno, 2006; Suryadarma, Suryahadi, Sumarto and Rogers, 2006).

Third, the effects of low levels of education on poverty outcome may be ‘softened’ in better off areas due to the favorable informal jobs that dominate the employment scene. The level of education required for some of these jobs are not ‘demanding’. So individuals with low levels of education employed in the informal sector from developed regions may be economically better-off since they earn well.

Following these arguments, the second research question of this chapter explores the regional variation of an individual’s education and employment status on poverty outcome. More specifically: *do poorly educated informal workers have a much higher risk of poverty in less developed than in better-off regions?*

The research questions are explored using a series of cross-sectional datasets, that is, the National Socioeconomic Survey of Indonesia (SUSENAS in its Indonesian acronym) 2000–2009.⁶³ The rest of this chapter is organized as follows: The next section presents the literature review and hypotheses. The review of the literature resulted in the formulation of two specific hypotheses. The following section is on Methods and Data. Besides briefly explaining the construction of the variables of interests, a descriptive overview of the human capital achievement of Indonesians between 2000 and 2009 is summarized in this section. Next is the results section. This section starts off with three sets of bivariate association: education and poverty; employment and poverty; education and employment. This step is important to provide an overview of the relationship between people’s educational achievement, employment status and their poverty outcome in view of the sparse existing literature on this subject in the recent decade. This is followed by analyses of the hypotheses. The final two sections cover the discussion of the results and the conclusive findings and limitations of this chapter.

⁶³ An exception to this decision is the 2008 survey data. Information on household expenditure was not collected as part of the SUSENAS Core 2008. So I have drawn data from the SUSENAS Module (Expenditure and Income) 2008. The sample size for 2008 is much smaller compared to other survey years. However the weighting of the sample, developed by BPS, allowed for the variables to be comparable to the core sample.

4.2 Literature review and Hypotheses

The first research question is on the association between levels of education and poverty outcome and to what extent the association varies by people's employment status. More specifically, the literature explores whether the less educated are clustered around informal employment, thereby increasing their risk towards poverty.

4.2.1 The risk of poverty among the less educated

The literature on the returns of education in Indonesia has demonstrated that educational level significantly determines income level. In their work, Purnastuti, Miller and Salim (2013) find that monthly earnings of working-age individuals increase as the level of education increase. By applying an OLS regression model on individual level data from 2007–2008, the authors show that working-age adults with primary school as their highest qualification earn 6 percent more than those who did not finish their primary schooling. The returns further increases for those at the upper tiers of education: those with lower secondary qualification earn 16 percent, general upper secondary qualification earn 31 percent and those with tertiary education earn 50 percent and more than those who did not finish primary schooling. In their model, the authors control for the number of years since individuals left school, the number of years in a present job, gender, marital status and rural-urban location: all potential factors that may influence one's earnings. An advantage of the dataset used in this study – the Indonesian Family Life Survey (IFLS) – is that earnings data is available for working-age adults across all employment statuses, be it formal or informal. However, the authors did not include employment status as a control variable in the model, thus the inability for readers to identify whether the returns of education varies by level of employment. In addition, potentially the effects of the returns of education have been overestimated as the IFLS sample does not include the most remote provinces of Indonesia, specifically Papua and Maluku, where the poorest and most deprived are found.

From the work of Purnastuti et al. (2013) it is possible to generalise that education is an important medium for reducing poverty for they have empirically demonstrated that higher education is associated with higher income. In Nepal, a country poorer than Indonesia by many standards,⁶⁴ Bhatta and Sharma (2011) find that having basic literacy makes a big difference in the well-being of households. Using panel data from two time points, that is,

⁶⁴ The standards are defined using national *per capita* income and national non-income measures such as child mortality, maternal mortality and years of schooling.

1995/96 and 2003/04, they find that 42 percent of the headship is literate for households that remained above the poverty line, 23 percent are literate in households that make the transition into and out of poverty, while only 15 percent are literate in households that remain poor through the 10 year period. By standardizing the coefficients, the authors conclude that knowing how to read and write has the greatest impact on reducing chronic poverty. The numbers derived from the study indicate a qualitative insight: households face a higher risk of persisting poverty when their primary provider lacks the most basic levels of education.

Similarly, in Vietnam, an emerging economy that is comparable to Indonesia, the importance of secondary education has been emphasized. Household data from rural Vietnam shows that heads of household with lower secondary education had 24 percent less probability of experiencing chronic poverty, in comparison to heads with no formal education (Baulch and Vu, 2011). By using the same set of rural panel data spanning three time points, 2002, 2004 and 2006, they further demonstrate the ‘lock-in’ effects of poverty for each transitions (this means they tested seven possible poverty transitions across the three waves). They find that *having* secondary education has a positive impact on moving out of poverty with primary education having a similar but smaller effect, when both levels were compared to those with no formal education.

In Indonesia, the powerful role of education in mitigating poverty has been equally asserted. Using a panel dataset covering two time-points, that is, 1993 and 2000, McCulloch, Weisbrod and Timmer (2007) set out to analyse the pathways out of poverty among rural Indonesians. Holding all else equal, the authors find that the odds of escaping poverty increase by 14 percent for every one additional year of schooling. A report by UNESCO show that completing lower secondary education in Indonesia not only more than doubled the probability of escaping poverty, but also reduced by a quarter the probability of falling into poverty (2014:145).

In another piece of work, Suryahadi, Sumarto and Pritchett (2003) demonstrate the vulnerability of poorly educated Indonesians during the economic crisis of 1997–1998. By drawing data from SUSENAS 1996 and 1999, the authors show that among those with upper secondary education, the headcount poverty incidence jumped from 3 percent in 1996 to 9 percent in 1999. Among those who did not complete primary education, the poverty rate increased from 25 to 41 percent during the same period. In other words, for a country where a

significant number of the population is clustered just above the poverty line, those who lacked education fared well during economically good times, but they are particularly vulnerable during major economic shocks. Of course one may argue that the major economic downturn also affected those with higher levels of education. By comparing figures between 1999 and 2000, the authors demonstrate that poverty decreased much faster among those with higher levels of education than those lacking education. In other words, during economic difficulties many people tend to fall into hardship, but those lacking education take longer to recover from their downfall than those with higher levels of education.

Some have suggested that the economic vulnerability among the poorly educated is partly due to the nature of their employment (Manning and Sumarto, 2011; Islam, 2006).

4.2.2 The nature of employment among the poorly educated

The Indonesian literature on the returns of education in the labour market is predominantly focused on the relationship between the different levels of education and wages, that is, income from employment. One can argue a positive linear association between income and employment statuses, where income levels are the highest for professional workers and begin declining from white collar workers, craft, blue collar to menial workers. In a general sense, this may be true but it is worth bearing in mind from this point that Indonesia's national surveys have great limitation when it comes to data on employment based income. Some 30 percent of Indonesians make a living in regular employment. But the large majority are self-employed workers in informal services and small-scale manufacturing where productivity and wages are kept low; or employed as casual workers dependent on seasonal employment in agriculture, construction and tourism (Manning and Pratomo, 2013; Manning 2010). They often find themselves without income between time periods. Due to the periodic nature of income among the self-employed and casual workers - who form majority of the informal workforce - the national surveys of Indonesia do not collect income data for those workers. As such, any findings on the return of education on wages in Indonesia can only be associated to some one third of the working population attached to formal or wage employment.

An exception to this trend is the work by Comolo and Mello (2010), which looks at the effects of years of schooling on both earnings and employment status.⁶⁵ Despite relying on the 2004 national Labour Force Survey (SAKERNAS in its Indonesian acronym), the authors methodologically adjusted for the absence of the earnings of informal and inactive workers in their models. By using an OLS regression (where the adjustment was not applied), the authors initially demonstrate that with every additional year of schooling, the income of formal workers increase by 9.5 percent. By applying the adjustment, they show that the return to education among formal than informal worker is 10.2 percent.⁶⁶ In addition, by extending their methodologically adjusted estimations to employment status, they find that for every additional year of schooling, the likelihood of individuals engaged in informal than formal employment declined by 5 percent. Also, the likelihood of individuals being inactive rather than engaged in formal employment declined by 6 percent for every additional year of schooling. In other words, workers with higher educational attainment are more likely to find a job as salaried employees, that is, as formal workers than being employed as informal worker or staying economically inactive.

But how do the poorly educated fare in terms of unemployment? Going by the international literature, poorly educated individuals are associated with unemployment which in turn has a long term negative impact for household well-being (Woolard and Klasen, 2005). In contrast, the literature on unemployment in Indonesia has a different story: unemployed Indonesians have higher levels of education and lower levels of poverty. The unemployment phenomenon is largely associated among young school leavers and tertiary graduates from relatively well-to-do family backgrounds who are waiting for reasonably secured jobs in the formal sector (Dhanani et al., 2009; Suryadarma et al., 2005; Mason and Baptist, 1996). In Indonesia, the general acknowledgement is that the poor cannot stay unemployed for long.

⁶⁵ Besides years of schooling, Comolo and Mello (2010) also include age, age squared, residence, gender, marital status and household dependency ratio in their analytical models. The primary purpose of their research is to estimate the determinants of earnings and employment in Indonesia.

⁶⁶ The first alternative is the binomial Heckman selection model. The Heckman procedure deals with truncations in the earnings distribution, such as in the case where earnings data is only available for salaried workers. The dependent variable used in this model is bivariate, that is the logged hourly wage of formal workers versus the estimation for those outside of the formal sector. The second alternative is the multinomial selectivity model based on the argument that Indonesia's labour market is fragmented, thus takes into account of the logged wage of formal workers and the estimation separately for informal workers and inactive workers. The authors conclude that the binomial model are too crude for describing selection in the Indonesian labour market, hence making the estimates based on the multinomial model more reliable.

Since the literature has established that the poor are largely uneducated, then another way of looking at this is that those lacking formal education cannot afford unemployment as it will have a detrimental consequence on their access to food and other basic needs. However, Islam (2006) cautions that not all unemployed Indonesian workers come from reasonably affluent backgrounds. The author asserts that “there are those who are the victims of penurious socioeconomic circumstances” (2006:327).

In addition, Suryadarma et al., (2005) have critiqued the narrow definition of unemployment used by BPS. During the economic crisis of 1997–1998, the authors documented many cases of individuals who faced difficulties in finding employment, eventually giving up hope and becoming *discouraged*. Discouraged workers are defined as jobless workers who want jobs but do not look for the jobs because they do not believe a job is available for them (Suryadarma et al., 2005). In national household surveys, this particular group is potentially identified as economically inactive, thus underreporting unemployment and inflating the inactivity group. The authors estimate that in the late 1990s, there were some 10 million discouraged workers, potentially conflated as economically inactive. It is worth bearing in mind that most figures on the nature of employment in Indonesia are based on descriptive analyses. Because working-age adults do differ in a number of other aspects, it is not evident how the unemployed would fare in comparison to those in informal employment or those who are economically inactive after controlling for their age, gender, level of education and location.

The literature reviewed thus far indicates that Indonesians lacking formal education fare less well economically because they have vulnerable jobs. Mostly they are clustered in the informal employment. There is a lack of certainty among the unemployed and economically inactive given the lack of rigorous empirical analyses focused on these groups. Following this reasoning, the first hypothesis is: *The risk of poverty is stronger for those lacking formal education and is engaged as informal worker than the combination of any other level of education and employment statuses (Hypothesis 1).*

4.2.3 Poverty among less educated workforce – regional variation

The second research question explores to what extent there is regional variation in the association between levels of education, employment status and poverty. More specifically, the question explores whether informal workers lacking formal education and living in less developed regions are economically worse off than their counterparts living in developed regions. Lower tier informal workers such as farmers and casual labourers are largely clustered in less developed areas of the country. In addition, those who lack formal education in these areas are less likely to migrate for employment opportunities compared to their associates with more years of schooling,⁶⁷ thus leaving behind the least educated in deprived areas. Many continue to be locked in farming activities with poor returns or engaged in poorly paid lower-services jobs. Hence, the combined effects of poor education and informal employment result in substantially poorer economic outcome for those living in less developed than better off areas.

In addition, the effects of low levels of education on poverty outcome may be ‘softened’ in better off areas due to the favorable informal jobs that dominate the employment scene. For an example, in some areas of the country such as in Bali and Yogyakarta, employment in the urban informal economy is characterized by tourism based enterprises. The level of education required for some of these jobs are not ‘demanding’: such as setting up food stalls or selling handicrafts to tourists. So individuals with low levels of education employed in the informal sector from developed regions may be economically better-off since they earn well. These are assumptions since the local literature on Indonesia does not provide an answer to whether people’s level of education responds to poverty outcome differently across the archipelago.

This suggests that the working-age population living in less developed regions of the country are not in a level playing field as their counterparts in more developed regions. Following the discussion above, we may expect that: *Poorly educated informal workers in less developed regions have substantially higher risk of poverty than those from better-off regions (hypothesis 2).*

⁶⁷ On average rural-urban migrants in Indonesia have 10 years of schooling. The figures were obtained from Kong and Effendi’s study on migrants to four cities of Indonesia (2011). While the focus of their study was on the occupational choice and mobility of migrants, these figures obtained from their descriptive table (Table 7.2:142-43) indicate that those with some formal education are more likely to migrate than those lacking formal education.

4.3 Data and Methodology

4.3.1 Data

In this chapter, data from SUSENAS Core 2000–2009 have been utilised. The SUSENAS Core has an annual average sample of some 900,000 individuals originating from some 200,000 households that are representative at the district level. The data is conducted annually by the Central Bureau of Statistics Indonesia (BPS in its Indonesian acronym). Basic socioeconomic data is collected from each household member, in particular on individual's education, labor market and health. In addition, information on food and non-food expenditure used as the basis to construct poverty indicator are collected at the household level.

4.3.1.1 Sample selection

For the purpose of this chapter, individuals of the legal working age, that is, between 15 and 65 years with highest level of completed education were selected as sample criteria. This resulted in the final sample consisting of 5,451,978 individuals, aged between 15 and 65 years. There is a small group of individuals outside the age group of 15-65, who are engaged in active employment, but are excluded from the final sample. This includes 67,215 individuals between 10 to 14 years who are out of the schooling system and 362,972 individuals age 66 years and older. Despite being an interesting group, working children and elderly Indonesians have very different work and education dynamics than the general working-age population. The small sample also renders the reliability of the results for this particular age group. Hence they were excluded from the final analytical sample.

4.3.2 Variables

4.3.2.1 Independent variable 1: Highest level of educational qualification

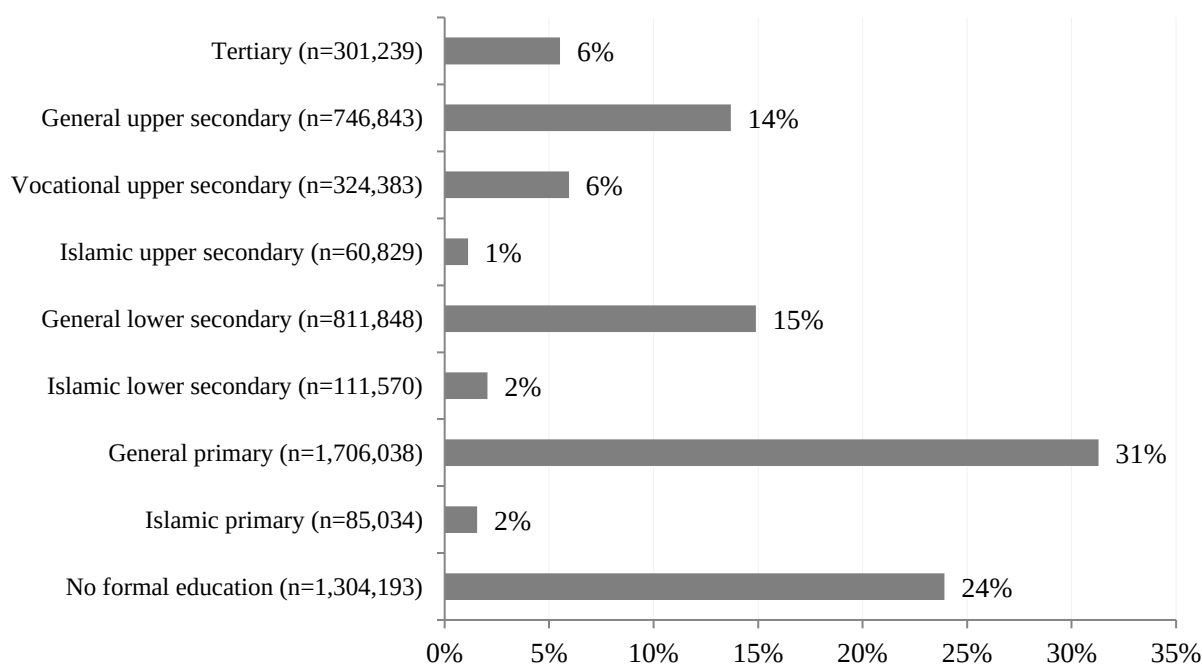
In Indonesia, the schooling system broadly consists of three major streams: general, vocational and Islamic vernacular. The general and vocational education falls under the responsibility of the Ministry of Education and Culture.⁶⁸ On the other hand, the Islamic vernacular schooling system or madrassa education is centralized under the Ministry of Religious Affairs.⁶⁹

⁶⁸In the SUSENAS dataset, the category of general education also encompasses the special needs education that exists at the primary and secondary level. Thus it was not possible to maintain the distinct categories for further analyses.

In previous quantitative studies, there is a tendency to merge the category of Islamic schooling with the general schooling system or to abstract the category all together. However, Permani (2011) argues that a substantial proportion of the low income families tend to enrol their children in Islamic schooling. In the descriptive analyses section, the categories of general, vocational and Islamic schooling were maintained as distinctive categories so as to explore its trends.

The distribution of the highest level of education among working-age Indonesians is shown in Figure 4.1. Some 24 percent of the working age population lack any formal education. A combined 33 percent (n=1,791,072) of the working age population have completed either general or Islamic primary schooling. In contrast, only a tiny minority (6 percent) are associated with tertiary level qualification. In the later stages of this chapter, the various types of upper secondary education and tertiary are clustered to form the higher education category. In combination, some 27 percent of the working age population are qualified with higher education. In sum, a large majority of the Indonesian population who are out of school are clustered at the lower tiers of educational level.

Figure 4.1. Percentage and frequency of distribution (weighted) of individuals by highest level of education completed, 15-65 years old, Indonesia, 2000-2009 (N=5,451,978)



⁶⁹ In Indonesia, a minority of the population follows the Islamic schooling education. In 2010, some 6 million children (8 percent of the total school aged children) were enrolled in this particular schooling system.

4.3.2.2 Independent variable 2: Employment status

The employment status variable applied in this chapter consist of four categories: employed as formal worker, employed as informal worker, unemployed worker and economically inactive person.

The SUSENAS Core survey identifies individuals as in employment if they are involved in any kind of work in the past week. The employment status question in the dataset allows for the identification of the diversity among those employed. The employment status categories are: employees, self-employed with permanent worker/s, self-employed with/without temporary assistance, and casual/unpaid family workers. A particular interest of this chapter is the distinction between formal and informal employment. BPS identifies formal and informal status based on the type of employment statuses that is underpinned by social security coverage. In other words, informal workers are individuals who lack social-security benefits, while formal workers are those with social-security coverage. Following this definition, individuals who are self-employed with or without temporary assistance, those working as casual workers and those working as unpaid workers are grouped as informal workers. Only the salaried, that is, those working as regular employees and employers with permanent workers are grouped as formal workers.^{70, 71}

The survey identifies a person as unemployed if two conditions are met: (1) he or she was not engaged in any form of work in the past seven days including unpaid work; and (2) the same person is actively seeking for work in the past week.

The final category of the employment status variable is the economically inactive population. A person is identified as inactive if he or she was not involved in any form of paid or unpaid work and have not been looking for jobs in the past week. This category generally include students enrolled in full-time education, the elderly, homemakers, those who are unable to work due to ill health, as well as discouraged workers, that is, those who have given up looking for jobs because they are discouraged by the job prospects.

⁷⁰ However, the definition by BPS is not without limitations. As indicated by Muliati (2013), while all civil servants and military personals receive full social security coverage, only some 25 percent of formal workers in the private sector are covered.

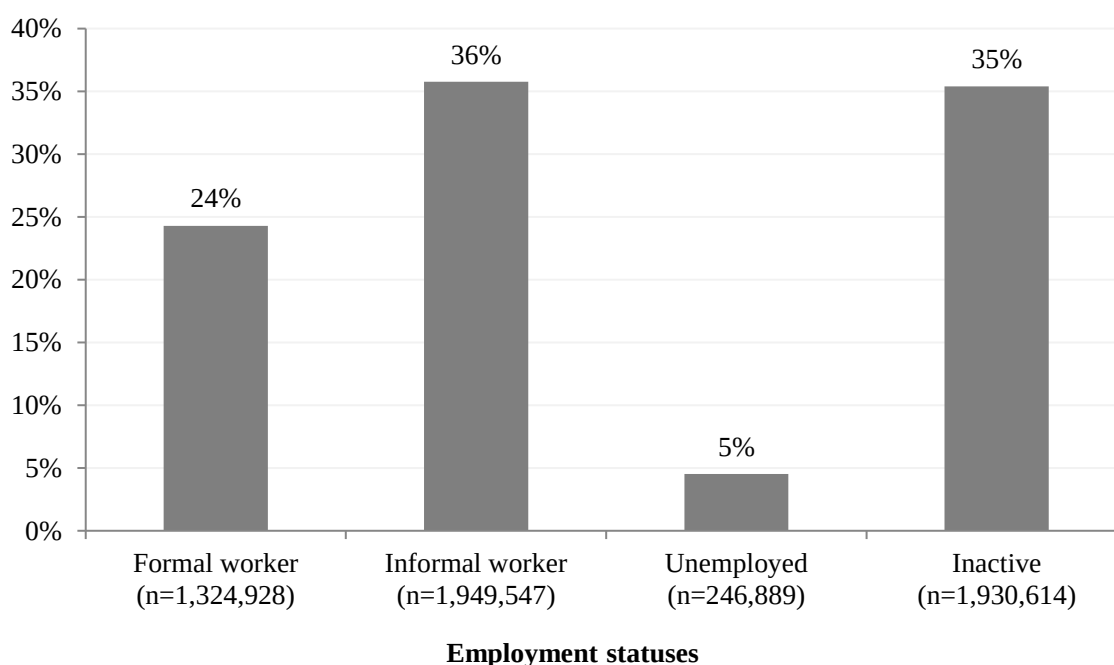
⁷¹ A summary of the grouping of informal and formal workers following their employment statuses is provided in Table 3.2 of Chapter 3.

The distribution of employment status among working-age Indonesians is shown in Figure 4.2. Between 2000 and 2009, some 60 percent of the working-age Indonesians were in employment. Among those in employment, the large majority are informal workers (60 percent out of the 3,274,350 individuals in employment).

In general, unemployment rates are low in Indonesia. On average, between 2000 and 2009, some 5 percent of the working-age population is identified as unemployed.

On the other hand, slightly more than one third of the working-age population is identified as economically inactive in the same time period. It is worth noting from the literature reviewed in the earlier section that the economically inactive category is potentially inflated by discouraged workers who essentially are unemployed workers who want jobs but do not look for one because they do not believe a job is available for them (Suryadarma et al., 2005). Ideally discouraged workers must be counted as unemployed workers which then means that unemployment rates may not necessarily be as low as currently reported.

Figure 4.2. Percentage and frequency of distribution (weighted) of individuals by employment status, 15-65 years old, Indonesia, 2000-2009



4.3.2.3 Dependent variable: BPS poverty

The construction of the poverty variable following the BPS methodology is discussed in detail in section 2.2 of Chapter 2. A summarised version of the content in Chapter 2 is presented in this section. This section outlines the three important steps involved in constructing the BPS poverty variable: (1) using *adjusted* household consumption expenditure as a welfare indicator; (2) converting household consumption expenditure to per person expenditure; (3) applying province-level BPS poverty lines to identify the poor from the non-poor.

Indicator of welfare: adjusted monthly household consumption expenditure

On both conceptual and practical ground, household consumption expenditure data is preferable to income data as an indicator of welfare. In comparison to income, expenditure better captures the consumption smoothing behavior of households (McCulloch and Baulch, 2000). This is especially so in societies where a fair share of the population works in job sectors that are seasonal and are less likely to receive fixed wages, thus income is volatile. Furthermore, expenditure data is less susceptible to measurement errors, that is, people are more likely to report their expenditure accurately than income.

On the practical side, the SUSENAS Core survey data covers more details on expenditure information than on income. Income is covered through a single question in the questionnaire which asks ‘What is the wage/salary (money and goods) usually received for primary work?’ In addition, the question is only applicable for those who are employed as employees, representing some 30 percent of the sample. The large share of self-employed and casual workers is excluded due to the seasonal nature of their income. Thus, in the context of the Indonesian society, household consumption expenditure data is seen as more viable as a welfare indicator than income data.

The household consumption expenditure data from the SUSENAS Core is a monthly sum spent by households on 15 aggregated food items (Table B.1, Appendix) and six aggregated non-food items (Table B.2, Appendix). Since the core survey covers aggregated items, the reported expenditure data is lower compared to the information that is collected through the module survey which covers some 215 specific food items and 90 specific non-food items.

The World Bank (2014:18) observes that when the consumption expenditure questions are more detailed, respondents are likely to remember in more detail and to report higher spending. It is, therefore, misleading to estimate poverty using what is essentially a ‘low’ consumption welfare data from the SUSENAS Core, as this will inherently result in high poverty rates. Hence, a practical approach was to adjust the mean household consumption expenditure data used in this thesis similar to the mean published from the Module for rural and urban areas by province and survey year. As a result, poverty estimates based on the adjusted consumption expenditure data were similar to the official figures published by BPS.

Individual-level welfare: per person adjusted monthly consumption expenditure

An important goal in measuring poverty is to understand individual-level welfare. Following this, a *per capita* approach was applied where the per person consumption expenditure is assessed as directly proportional to household size.⁷² By this approach, it is assumed that every member within the household has the same equivalent consumption, regardless of their age, gender and the relevance of shared goods within larger households. Additional analysis was undertaken in section 2.3.2 of Chapter 2 to test the robustness of the *per capita* scale by applying three equivalence scales that take into account the differences in needs (by age and gender) and economies of scale in consumption. The results show unrealistically low poverty levels when compared with the more common *per capita* scale.

So why does the use of equivalence scales not reflect reality of poverty in Indonesia? The BPS regional poverty lines are constructed based on the *per capita* costs of food and non-food items, meaning economies of scale are not taken into account in the poverty line methodology. Food items comprise more than 70 percent of the items used to calculate the regional poverty lines (BPS, 2009). In general, food consumption is less sensitive to economies of scale within the household. In other words, a five-member family will require food for five persons. So a bias result will emerge when *per capita* expenditure is adjusted for differences in needs and economies of scale within the household, while this is not the case for the poverty line.

⁷² Per person adjusted monthly consumption expenditure = Total adjusted monthly household consumption expenditure / household size.

Applying province-level poverty lines: Identifying the poor

This thesis has applied the BPS published province-level poverty lines to identify the poor in Indonesia. Details of the methodology applied in constructing the BPS line are discussed in section 2.2.3.1 of Chapter 2. Specifically, the BPS line follows the basic needs approach. The line represents the cost of consuming 2,100 calories a day per person, plus an allowance for non-food requirements such as clothing, education, health and housing. In an archipelago such as Indonesia, where markets are not fully integrated spatially, the costs of individual's basic needs basket vary by where they live (Bidani and Ravallion, 1993: 38). Since prices of goods and services vary across the archipelago, poverty lines are developed for rural and urban areas by province. The lines are then indexed to the price level in Jakarta, such that the cost of the basic needs is comparable across provinces. In other words, regional disparities in consumption arise only because of differences in consumption patterns and prices, and not because of differences in income levels (Miranti, 2010:80).

In sum, the BPS poverty measure that is applied in this thesis identifies Indonesians as poor when their per person adjusted monthly expenditure falls below the published poverty line.

4.3.2.4 Control variables

A set of control variables have been included in the models: age, female, dependency ratio, rural location and provinces. Demographic variables potentially may influence the association between education, employment and poverty. There is some evidence that the relationship between education and poverty varies by age: older adults lacking formal education are associated with higher risk of poverty and the association is stronger among individuals living in the island of Java (Priebe and Howell, 2014). In addition, the negative association between education and poverty are more likely to be stronger among women than men because in general women are less likely to be in employment than men. The dependency ratio⁷³ is also included as a control variable. The variable is a proxy of dependency on household resources. Finally, the negative association between education and poverty are more likely to vary by urban and rural areas given that in rural areas, the quality of education is lower than in urban areas.

⁷³ The dependency ratio at the household level was computed as the number of household members who are younger than 15 or older than 65 divided by the number of household members aged 15-65.

In addition, the average years of schooling of other adult household members, which proxies for variation in the level of education within households, have been included in the models.⁷⁴ So, this chapter focuses on the association between education and poverty and its variation by employment status and regional economy, net-off a consistently measured set of control variables.

4.3.3 Models

The data used in this chapter have a clustered structure. First, individuals are ‘nested’ within households. However, since individuals within the same household have the same poverty outcome, then this level is considered null. The other individuals are ‘nested’ within provinces, that is, there are provincial level characteristics that affect individual outcomes. However, there is little variation within provinces since a large majority of Indonesians have lower tiers of educational qualification and employment status. Rather, the interesting variation occurs between provinces.

Following the argument above, this chapter uses logistic regression to test the hypotheses.⁷⁵

The dependent variable, poverty, is dichotomous variable (1=Poor; 0=Non-poor).

The baseline model assumes that poverty outcome is a function of individual’s educational qualification and employment status:

$$\begin{aligned} \text{POVERTY}_i = & \alpha + \beta_1 \text{NO_FORMAL_EDU}_i + \beta_2 \text{ISLAMIC_PRIMARY}_i + \beta_3 \text{GENERAL_PRIMARY}_i + \\ & \beta_4 \text{ISLAMIC_LOWER_SEC}_i + \beta_5 \text{GENERAL_LOWER_SEC}_i + \beta_6 \text{ISLAMIC_UPPER_SEC}_i + \\ & \beta_7 \text{VOCATIONAL_UPPER_SEC}_i + \beta_8 \text{GENERAL_UPPER_SEC}_i + \beta_9 \text{TERTIARY}_i + \beta_{10} \text{FORMAL_WORKER}_i + \\ & \beta_{11} \text{INFORMAL_WORKER}_i + \beta_{12} \text{UNEMPLOYED}_i + \beta_{13} \text{INACTIVE}_i + \beta_{14} \text{AGE}_i + \beta_{15} \text{FEMALE}_i + \\ & \beta_{16} \text{DEPENDENCY}_i + \beta_{17} \text{AVG_EDU_YEARS_OTHER_HH_MEMBERS}_i + \beta_{18} \text{RURAL}_i + \\ & \beta_{19-28} \text{YEAR}_{2000-2009}_i + \beta_{29-61} \text{PROVINCE}_i + \varepsilon_i \end{aligned} \quad (4.1)$$

where, i = person i^{th} ($i_1, i_2, \dots, i_n$)

⁷⁴ Because SUSENAS reports the highest educational qualification achieved, I transformed the reported achievements into the minimum number of years required to obtain the corresponding qualification in Indonesia. For instance, primary educational attainment is coded as 6 years of schooling, while Diploma III (which is equal to a Bachelor’s Degree) corresponds to 15 years of schooling. I have assigned a score of 3 to those individuals who have incomplete primary education and 0 to those who have no formal schooling.

⁷⁵ A multilevel logit model was applied using a 5% sub-sample of the data for robustness check. The outcome is discussed accordingly in the Results section of this chapter.

Following the baseline model, the first hypothesis assumes that poverty outcome is a function of the interaction between individual's educational qualification and employment status. At this stage, several categories of the educational level were collapsed so as to have a clearer picture of the trend. A dichotomous variable on type of education (Islamic versus general) were included in the models to account the variation found between the different types of education on poverty outcome. The full model specification applied in the analytical section is as follows:

$$\begin{aligned}
\text{POVERTY}_{ip} = & \alpha + \beta_1 \text{NO_FORMAL_EDU}_i + \beta_2 \text{PRIMARY}_i + \beta_3 \text{LOWER_SEC}_i + \beta_4 \text{UPPER_SEC}_i \\
& + \beta_5 \text{TERTIARY}_i + \beta_6 \text{FORMAL_WORKER}_i + \beta_7 \text{INFORMAL_WORKER}_i + \beta_8 \text{UNEMPLOYED}_i \\
& + \beta_9 \text{INACTIVE}_i + \beta_{10-29} (\text{EDUCATION} \times \text{EMPLOYMENT STATUSES})_i + \beta_{30} \text{AGE}_i \\
& + \beta_{31} \text{FEMALE}_i + \beta_{32} \text{DEPENDENCY}_i + \beta_{33} \text{EDUCATION_TYPE}_i \\
& + \beta_{34} \text{AVG_EDU_YEARS_OTHER_HH_MEMBERS}_i + \beta_{35} \text{RURAL}_i + \beta_{36-45} \text{YEAR}_{2000-2009}_i \\
& + \beta_{46-78} \text{PROVINCES}_i + \varepsilon_i
\end{aligned} \tag{4.2}$$

The second hypothesis assumes that poverty outcome is a function of the interaction between individual's educational qualification and employment status but it varies by region. A series of logistic regression models were generated by five of the major regional islands: (1) Java, (2) Sumatera, (3) Kalimantan, (4) Sulawesi and (5) Nusa Tenggara, Maluku and Papua. The choice of adopting individual models for each region provided a better overall sense of the trend between education and poverty. The only variations between the regional level models were the control for the number of provinces within the regional island. As an example, the model for Sumatera region is expressed as follows:

$$\begin{aligned}
\text{POVERTY}_{ip} = & \alpha + \beta_1 \text{NO_FORMAL_EDU}_{ir} + \beta_2 \text{PRIMARY}_{ir} + \beta_3 \text{LOWER_SEC}_{ir} + \beta_4 \text{UPPER_SEC}_{ir} + \\
& \beta_5 \text{TERTIARY}_{ir} + \beta_6 \text{FORMAL_WORKER}_{ir} + \beta_7 \text{INFORMAL_WORKER}_{ir} + \beta_8 \text{UNEMPLOYED}_{ir} + \\
& \beta_9 \text{INACTIVE}_{ir} + \beta_{10-29} (\text{EDUCATION} \times \text{EMPLOYMENT STATUSES})_{ir} + \beta_{30} \text{AGE}_{ir} + \beta_{31} \text{FEMALE}_{ir} + \\
& \beta_{32} \text{DEPENDENCY}_{ir} + \beta_{33} \text{EDUCATION_TYPE}_{ir} + \beta_{34} \text{AVG_EDU_YEARS_OTHER_HH_MEMBERS}_{ir} + \\
& \beta_{35} \text{RURAL}_{ir} + \beta_{36-45} \text{YEAR}_{2000-2009}_{ir} + \beta_{46-55} \text{PROVINCES_SUMATERA_ISLAND}_{ir} + \varepsilon_{ir}
\end{aligned} \tag{4.3}$$

where,

i = person i^{th} ($i_1, i_2, \dots, i_n$) living in region r

4.4 Results

4.4.1 Bivariate association

First, the bivariate association between education-poverty, employment status-poverty and education-employment status is presented.

4.4.1.1 Education and poverty

Table 4.1 presents the relationship between education and poverty in Indonesia through the 2000s. The results show a negative relationship between levels of education and poverty: lower levels of education are associated with higher levels of poverty. Some one fifth of the individuals who have no formal educational background are poor. Similar results are observed for individuals with Islamic and general primary level qualification.⁷⁶ In addition, those with Islamic education as their qualification have higher risk of poverty in comparison to those with general education at each given level of education.⁷⁷

Some seven percent individuals with higher secondary qualification are associated with poverty. Data applied in this chapter indicate that between 2000 and 2009, the increase in informal employment is most notable among those with secondary education. Not surprisingly, the lowest level of poverty was observed among those with tertiary level education – at two percent.

Table 4.1. The relationship between poverty and individual's highest level of educational qualification, Indonesia, 2000-2009

	% poverty	N
No qualification/education	22	1,304,193
Islamic primary	22	85,034
General primary	19	1,706,038
Islamic lower secondary	16	111,570
General lower secondary	14	811,848
Islamic upper secondary	11	60,829
Vocational upper secondary	7	324,383
General upper secondary	7	746,843
Tertiary	2	301,239
Total	16%	5,451,978

⁷⁶ Despite the similar levels of poverty between the categories of no qualification and Islamic primary education, in addition to vocational and general upper secondary, t-test results show that they are significantly different from zero.

⁷⁷ The t-test results show that the means between Islamic and general education at each level: primary, lower secondary and upper secondary are significantly different from zero.

4.4.1.2 Employment status and poverty

Table 4.2 presents the association between employment status and poverty among working-age Indonesians. The results show that the share of poverty is the highest among informal workers and the unemployed (18 percent respectively), followed closely by the economically inactive (17 percent). Formal workers are associated with less poverty.

Table 4.2. The relationship between poverty and individual's employment status, Indonesia, 2000-2009

	% poverty	N
Formal worker	11	1,324,928
Informal worker	18	1,949,547
Unemployed	18	246,889
Inactive	17	1,930,614
Total	16%	5,451,978

4.4.1.3 Education and employment status

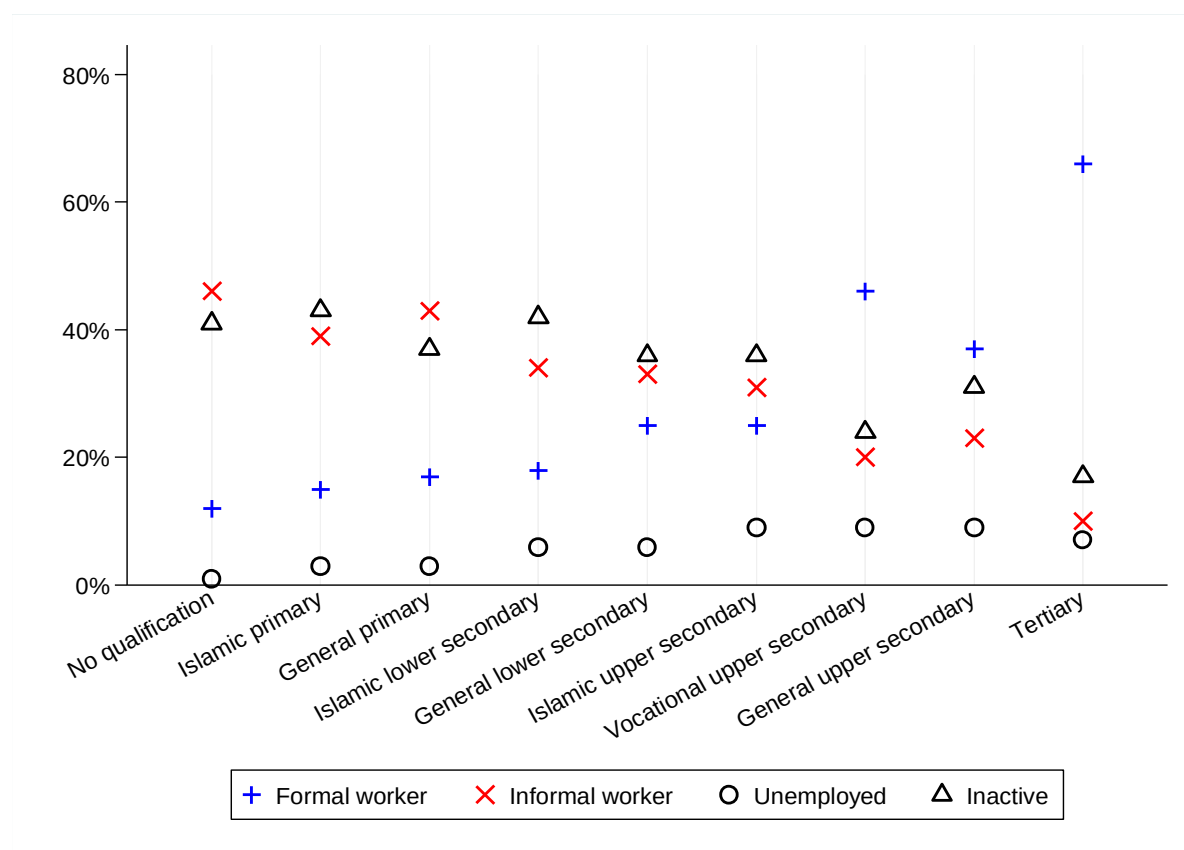
Figure 4.3 presents the bivariate association between level of education and employment status in Indonesia (Table D.1, Appendix). Individuals at the upper tier of educational qualification, specifically those with vocational secondary and higher, are favorably employed as formal workers than those at the lower tiers of education. Those without formal education are predominantly working as informal workers (46 percent).

While overall unemployment rate is low, they predominantly occur among those with higher educational qualification. The unemployment rate among those with tertiary education is seven percent, up from one percent among those with incomplete primary education and no formal schooling. The descriptive number is in line with previous studies that have continuously attested that the unemployment phenomenon in Indonesia is largely associated among young school leavers and tertiary graduates from relatively well-to-do family backgrounds who are waiting for reasonably secured jobs in the formal sector (Dhanani et al., 2009; Suryadarma et al., 2005; Mason and Baptist, 1996).

Figure 4.3 also show that bring economically inactivite is prevalent among those with lower secondary education and notably among those with Islamic schooling qualification. A closer look into the data show that some 60 percent of the women between 15-65 years are identified as economically inactive (while only some 10 percent of the male population of the

same age group are in similar status). Moreover, some 5 percent of the working age women population have Islamic schooling qualification while 4 percent men have the same qualification. In sum, economic inactivity seem to be much more prevalent among women, particularly among those at the middle tiers of educational qualification, as well as those with Islamic schooling qualification.

Figure 4.3. Percentage distribution of individual's employment status by level of education, Indonesia, 2000-2009



Because employment status differs by a number of other important characteristics, the association between the level of education and employment status was further analyzed after controlling for age, gender, dependency ratio, rural location and province.

A multinomial regression model was applied (Table D.2, Appendix) and predicted probabilities were computed from the coefficients using the *margins* command in STATA.⁷⁸ The predicted probabilities are presented in a graphical format using the *marginsplot* command in STATA (Figure 4.4). The trend of predicted probabilities illustrated in Figure 4.4 confirms the descriptive pattern shown in Figure 4.3. The probability of being employed as a formal worker among those with tertiary education is 68 percent, while it is only 17 percent for someone lacking formal education (as illustrated in Figure 4.4).

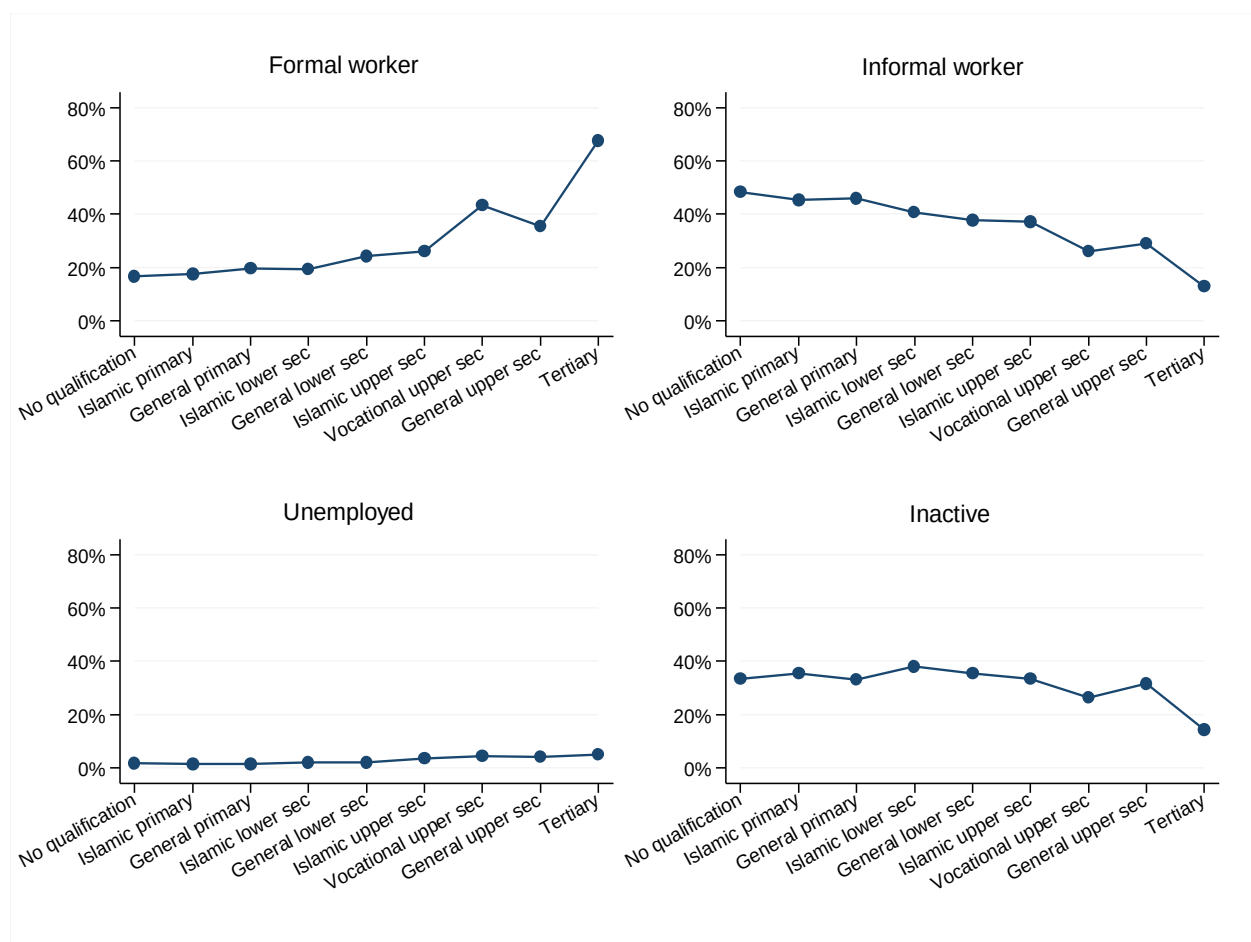
In contrast, the probability of being employed as an informal worker is only 13 percent among those with tertiary qualification while it is 48 percent for those lacking formal education (Figure 4.4). In other words, the drop in the probability of being employed as an informal worker is more notable among those at the upper most tier of educational qualification.

The disadvantage observed among those at the upper tiers of education is the higher probability of unemployment. The probability of someone with tertiary qualification being unemployed is at 5 percent, while it is 2 percent for those lacking formal education (Figure 4.4). This suggests that those lacking formal qualification are less likely to be unemployed than those with the highest level of qualification. This results lend some support to the argument that those occupying the lowest tiers of educational qualification cannot afford unemployment as it will have a detrimental consequence to fulfilling their everyday basic needs.

Figure 4.4 also show that the probability of being economically inactive is high among those with lower secondary qualification, as well as those with Islamic schooling qualification. In particular, the probability of inactivity is 38 and 36 percent for those with Islamic and general lower secondary qualification respectively, followed by 35 percent probability for those with Islamic primary qualification. Among those lacking formal education, the risk of inactivity is 33 percent.

⁷⁸ It is helpful to think in terms of the probability of working age adults in Indonesia being employed as formal worker, informal worker, unemployed or inactive by their level of education. Here probabilities are preferred as it is easier to interpret the fraction of individual's employment outcome for every possible educational qualification with a value between 0 and 100 percent, where 0 represents a nil probability for the outcome to happen and 100 percent represents an inevitable outcome.

Figure 4.4. Predicted probabilities of employment status by level of education, Indonesia, 2000-2009



In sum, the bivariate results suggest four important points. First, poverty levels are prevalent and comparable among informal workers and the unemployed. Second, working-age Indonesians who have primary education and less as their qualification are more likely to be engaged as informal workers. Third, high school and more educated individuals have higher probability of unemployment. Fourth, working-age Indonesians who are economically inactive have very close poverty levels to those in informal employment and the unemployed (17 versus 18 percent respectively). This is a concern given that a sizable working-age population – some one third of them – is economically inactive. In addition, we also find those in the middle tiers of educational qualification are more likely to be economically inactive compared to those lacking formal education. Descriptive figures indicate that the trend is much more prevalent among women than men.

4.4.2 Analyses

4.4.2.1 The association between education, employment status and poverty

Hypothesis 1: *The risk of poverty is stronger for those lacking formal education and are engaged as informal worker than the combination of any other level of education and employment statuses.*

Following the descriptive section, this section presents the results of models where the level of education and employment status are included, in addition to the consistently measured set of control variables (Table 4.3). Model 1 is the basic model which includes the education dummies. Model 1 closely replicates the results that were discussed in the previous section: the risk of poverty falls with increasing levels of education. In addition, the risk of poverty is also higher among individuals with Islamic education than those with general education at any given level. This confirms Permani's (2011) descriptive findings of poorer socioeconomic outcome among those with Islamic education background.

Table 4.3. Logistic regression analyses predicting individual's poverty outcome by their level of education, results as odds ratio: effect of employment status added in Model 2

	Model 1		Model 2	
<i>Ref: No formal qualification</i>				
Islamic primary	0.80***	(0.01)	0.81***	(0.01)
General primary	0.75***	(0.004)	0.76***	(0.004)
Islamic lower secondary	0.59***	(0.01)	0.59***	(0.01)
General lower secondary	0.52***	(0.01)	0.52***	(0.01)
Islamic upper secondary	0.42***	(0.02)	0.42***	(0.02)
Vocational upper secondary	0.27***	(0.01)	0.28***	(0.01)
General upper secondary	0.29***	(0.01)	0.29***	(0.01)
Tertiary	0.08***	(0.02)	0.08***	(0.02)
<i>Ref: Employed as formal worker</i>				
Informal worker			1.19***	(0.01)
Unemployed			1.93***	(0.01)
Economically inactive			1.32***	(0.01)
Age	0.98***	(0.0001)	0.98***	(0.0001)
Female	0.90***	(0.003)	0.83***	(0.004)
Dependency ratio	2.10***	(0.003)	2.13***	(0.003)
Avg schooling years of other HH adults	0.93***	(0.0001)	0.93***	(0.0001)
Rural	0.75***	(0.004)	0.74***	(0.004)
Log pseudolikelihood	-500,000,000		-498,000,000	
Pseudo R-Squared	0.11		0.11	

Note 1: *** p<0.001; ** p<0.01; * p<0.05;

Note 2: Coefficients on province dummies and survey year dummies are not reported;

Note 3: N=5,451,978

Model 2 introduces the dummies for employment status, following the specifications of Equation 4.1. All three categories of employment – informal workers, unemployed individuals and those who are economically inactive – have higher odds of poverty than formal workers. The model fit has remained stable with the inclusion of employment status in the model, despite the general consensus on the importance of employment for poverty outcome. This suggests that by itself, the level of education is a strong predictor of poverty outcome. The level of education is strongly associated with one's labour market position (as shown in Figure 4.4). The least educated are more likely to cluster in the informal employment or remain economically inactive, while the highly educated are more likely to settle in formal employment.

But do the combination of no formal education and informal employment result in a substantially higher risk of poverty, than the combination of all other levels of education and employment status? In order to present the trends succinctly, the categories of educational level were collapsed into four major categories: No formal qualification, Primary education, Lower secondary and Higher. Model 2 was re-estimated with these collapsed categories (Table D.3, Model 2a, Appendix). The trends remain the same, with lower levels of education having higher risk of poverty.

In addition, as discussed under section 4.3.3, multilevel models are of lower relevance for this study, despite the clustered structure of the data. This is because the within cluster variation is minimal. But for the purpose of robustness check, Model 2a was re-estimated as a multilevel model with provinces as a level 2 control. The idea is to check that leaving out this level of analysis does not distort the results presented here. The results (Table D.4, Model 2b, Appendix) do not differ much from Model 2a that uses logistic regression model where provinces are included as dummies. Therefore, this level of analysis is not applied in this chapter.

Model 3 (Table 4.4) following the specification of Equation 4.2, introduces the interaction between the categories of education and employment status. Predicted probabilities were calculated from the coefficients of Model 3. The trend of predicted probabilities is illustrated in Figure 4.5.

Table 4.4. Logistic regression predicting individual's poverty by their level of education, results as odds ratio: interactions with employment status added (Model 3) and interactions with gender added (Model 4)

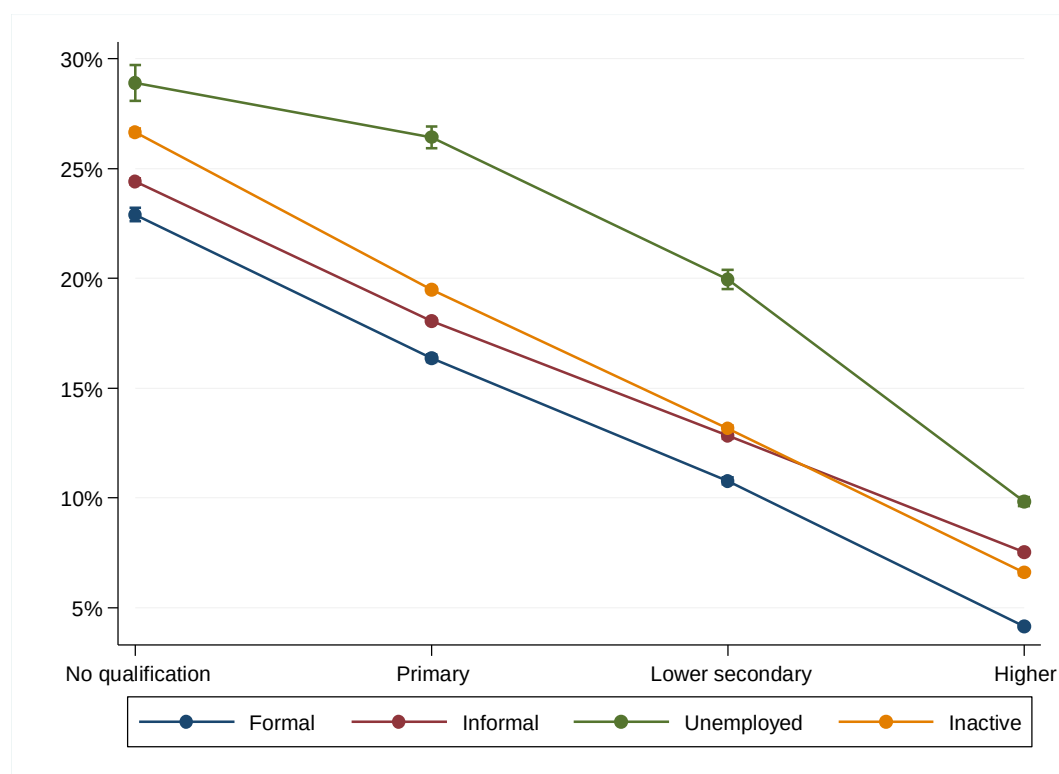
	Model 3		Model 4	
<i>Ref: No formal qualification</i>				
Primary	0.73***	(0.011)	0.76***	(0.011)
Lower secondary	0.47***	(0.013)	0.49***	(0.008)
Higher	0.19***	(0.013)	0.20***	(0.003)
<i>Ref: Employed as formal worker</i>				
Informal worker	1.07***	(0.010)	1.13***	(0.014)
Unemployed	1.39***	(0.024)	1.48***	(0.051)
Economically inactive	1.25***	(0.010)	1.33***	(0.023)
<i>Interaction (ref: No qualification x formal worker)</i>				
Primary x informal worker	1.05**	(0.013)	1.04**	(0.016)
Primary x unemployed	1.35***	(0.029)	1.25***	(0.050)
Primary x inactive	1.03	(0.013)	1.07	(0.024)
Lower secondary x informal worker	1.14***	(0.015)	1.15***	(0.021)
Lower secondary x unemployed	1.50***	(0.030)	1.38***	(0.057)
Lower secondary x inactive	1.07***	(0.016)	1.21***	(0.032)
Higher x informal worker	1.70***	(0.016)	1.68***	(0.031)
Higher x unemployed	1.76***	(0.028)	1.54***	(0.061)
Higher x inactive	1.35***	(0.016)	1.51***	(0.042)
<i>Interaction (ref: No qualification x male)</i>				
Primary x female			0.90***	(0.023)
Lower secondary x female			0.95***	(0.028)
Higher x female			0.82***	(0.023)
<i>Interaction (ref: Formal worker x male)</i>				
Informal worker x female			0.86***	(0.019)
Unemployed x female			0.83***	(0.040)
Inactive x female			0.81***	(0.020)
<i>Interaction (ref: No qualification x formal worker x male)</i>				
Primary x informal worker x female			1.02**	(0.030)
Primary x unemployed x female			1.20***	(0.070)
Primary x inactive x female			1.01	(0.033)
Lower secondary x informal worker x female			0.91***	(0.032)
Lower secondary x unemployed x female			1.19***	(0.073)
Lower secondary x inactive x female			0.86***	(0.032)
Higher x informal worker x female			0.96***	(0.035)
Higher x unemployed x female			1.42***	(0.082)
Higher x inactive x female			0.97***	(0.037)
Islamic education	1.19***	(0.008)	1.17***	(0.009)
Age	0.98***	(0.0002)	0.98***	(0.0002)
Female	0.83***	(0.004)	1.02***	(0.021)
Dependency ratio	2.12***	(0.005)	2.13***	(0.006)
Avg schooling years of other HH adults	0.93***	(0.0002)	0.93***	(0.0002)
Rural	0.74***	(0.004)	0.74***	(0.003)
Log pseudolikelihood	-499,000,000		-497,500,000	
Pseudo R-Squared	0.11		0.11	

Note 1: *** p<0.001; ** p<0.01; * p<0.05;

Note 2: Coefficients on province dummies and survey year dummies are not reported.

Note 3: N=5,451,978

Figure 4.5. Predicted probabilities of poverty by individual's level of education and employment status, Indonesia, 2000-2009



The results indicate that unemployed adults across all levels of education have higher probability of poverty, holding all else constant. In particular, the probability of poverty is the highest among those who have primary education or less as their highest qualification and are unemployed at the same time. The probability of experiencing poverty is lower if working-age Indonesians are engaged in employment even if it is of informal nature than being unemployed. This finding, based on data from 2000-2009, contributes new information to the labor market literature on Indonesia.

Previous studies often associate unemployment with lower risk of poverty since it is seen as widely afflicting the highly educated, in particular young university graduates (Dhanani et al., 2009). The explanation is that they are more likely to receive support from their well-to-do families. But one other work – Islam (2006) – did caution that unemployment is rising among the poorly educated. The results presented in Table 4.4 and further illustrated in Figure 4.5 supports the review by Islam (2006).

The probability of poverty is also higher among the inactive group than informal workers and the gap in probability between both groups is larger at lower tiers of education (Figure 4.5). The higher vulnerability among the economically inactive group may be explained by two potential reasons. First, many of the older members of the workforce lack social-security benefits (Muliati, 2013) hence heightening their risk of poverty. Second, the inactive category may have been inflated with *discouraged* workers who are not seeking work because they are discouraged by the lack of jobs (Suryadarma et al., 2005). By definition this group should be identified as in long-term unemployment, instead they are categorised as economically inactive.

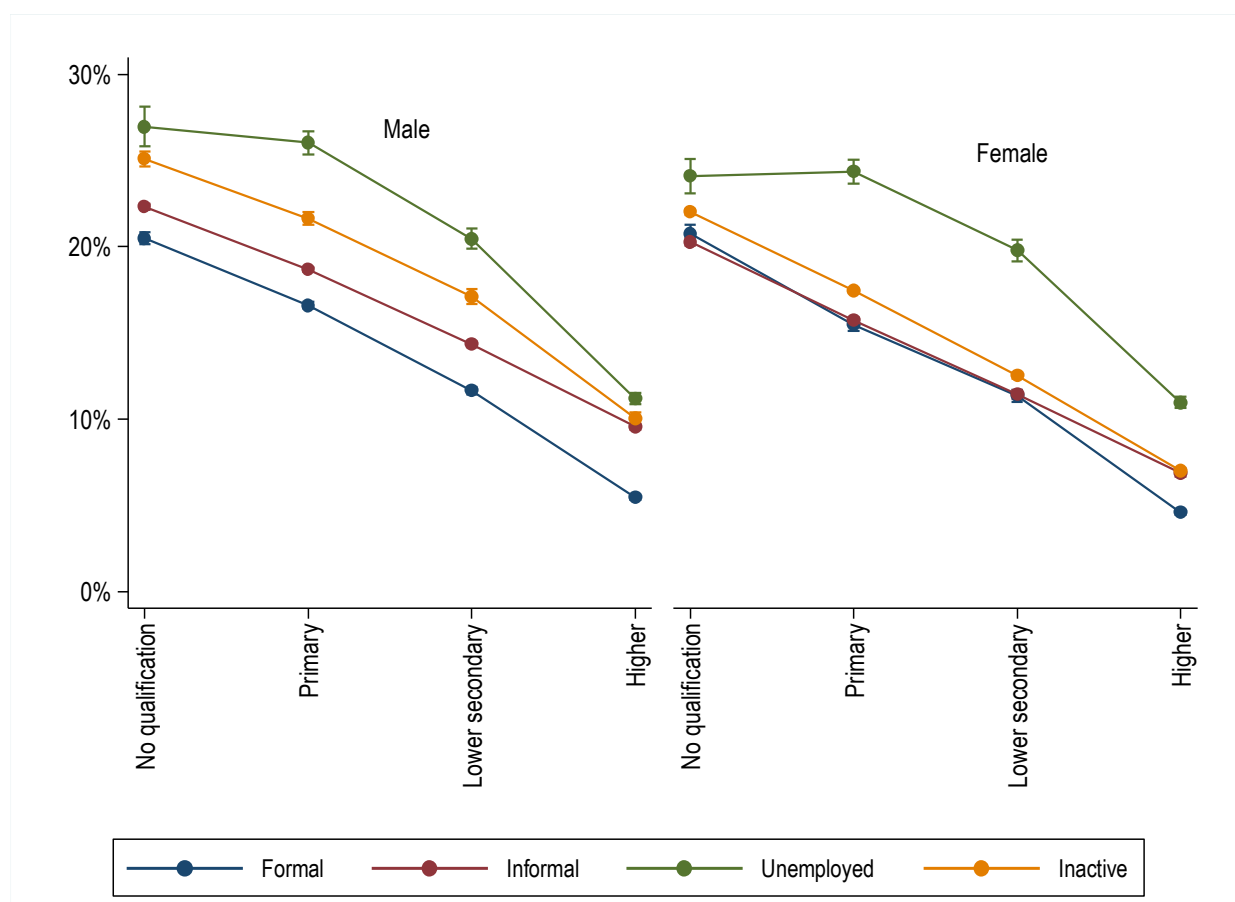
The descriptive numbers show that women are overwhelmingly represented in the economically inactive group. Some 60 percent of individuals in the inactive group are women within the age group of 15–65 years. Due to the conflated definition applied on this group, it is not possible to discern between homemakers and discouraged workers. However, as a further interest, this chapter briefly explored whether the relationship between educational qualification, employment status and poverty may produce different outcomes for men and women.

Model 4 (Table 4.4) introduces the interaction between the categories of education, employment status and gender. Predicted probabilities were calculated from the coefficients of Model 4 using *margins* command in STATA. The trend of predicted probabilities is graphically illustrated in Figure 4.6. The figure was produced using the *marginsplot* command in STATA. Figure 4.6 illustrates that the trend of association between education, employment and poverty by gender reflects the general trend observed in Figure 4.5. Unemployed men and women across all levels of education are associated with higher probability of poverty.

In general, the probability of poverty for men and women are comparably similar across the different combinations of education and employment statuses. The only expectation to the trend is observed among the economically inactive group (Figure 4.6). The probability of poverty is lower for inactive women than men of similar position at all levels of education. A potential explanation is that inactive women are less likely to live in poorer households than inactive men as women are more likely be married to men with higher socioeconomic status than themselves.

Figure 4.6 also illustrates an interesting trend for women in employment. The probability of poverty is strikingly similar between formal and informal female workers in the lower tiers of educational qualification. For example, the probability of poverty among female informal workers with primary level education is 16 percent, while it is 15 percent for female formal workers with the same qualification. This suggest, that perhaps formal and informal female workers are engaged in equally low quality jobs.

Figure 4.6. Predicted probabilities of poverty by individual's level of education, employment status and gender, Indonesia, 2000-2009



In the subsequent analysis of this chapter we will not pursue with a gender focus. This is because, we find very similar risk of poverty between employed and unemployed men and women across the different levels of educational qualification.

4.4.2.2 The association between education, employment status and poverty by time

So how robust is the finding that the risk of poverty is acute among unemployed adults with low levels of education than the combination of any other employment statuses and educational background? Is this a recent phenomenon? An additional analysis involving time (survey years) was undertaken. The probability of poverty by employment status and level of education across time was computed from Model 3 using the *margins* command in STATA. The results are illustrated in Figure 4.7. The trend over time (Figure 4.7) illustrates a sustained pattern of vulnerability among the unemployed across all levels of education.

There is very little variation between the probability of poverty and employment status for those lacking formal schooling qualification. The overall high poverty risk threshold around 25 percent suggests that there is much less scope for variation among the different categories of employment statuses.

It is somewhat easier to explain why the risk of poverty reduces for employed individuals who have previously spent longer time at school when compared to those who did not go to school or have fail to complete their primary schooling. Through their study, Purnastuti et al. (2013) empirically demonstrates that in Indonesia, primary educated workers earn some 6 percent more than those who lack formal education. Similarly, the authors show that lower secondary educated workers earn 16 percent more than those who lack formal education. In other words, the positive linear relationship between wage and level of education explains (at least to some extent) why the risk of poverty falls with increasing levels of education.

But that still leaves the question of why the risk of poverty has remained almost stable and high for unemployed individuals who have primary and lower secondary as their highest qualification? A closer look into the data reveals that these are predominantly young male headed households between the age group of 15-25 years. It may be the case of that not only tertiary educated individuals queue for reasonably secure formal sector jobs. Primary and lower secondary school leavers may hold out for some time hoping on getting jobs in the manufacturing and services industries. One of the drawbacks of primary and lower secondary school leavers queuing for formal sector jobs is that they may have fewer familial resources to fall back on when compared to those with tertiary qualification.

Figure 4.7. Predicted probabilities of poverty by individual's level of education and employment status across time, Indonesia, 2000-2009

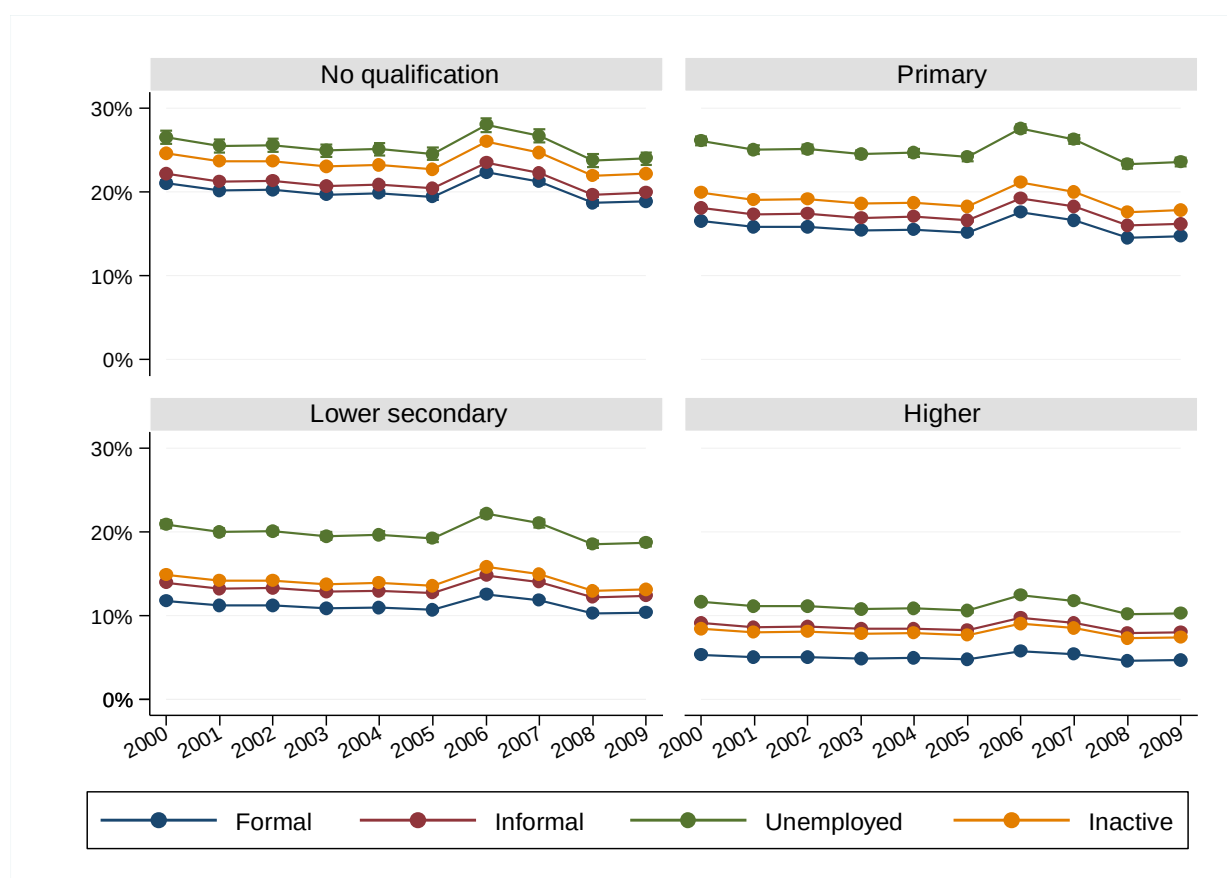


Figure 4.7 also illustrates that the risk of poverty decreases among the economically inactive group as their education level increases. This may be because individuals are more likely to opt to be inactive only under conditions where other members in the household are in employment and their household is not at the risk of falling poor.

Following this interesting finding on the association between education, unemployment and poverty, additional analysis was undertaken to confirm if the risk of poverty among those who are unemployed and lacking formal qualification is a regional phenomenon. For those seeking employment, urban informal sectors in high income provinces such as Jakarta are a source of hope.

Relevant to this context is the second hypothesis raised in this chapter.

4.4.2.3 The association between education, employment status and poverty by region

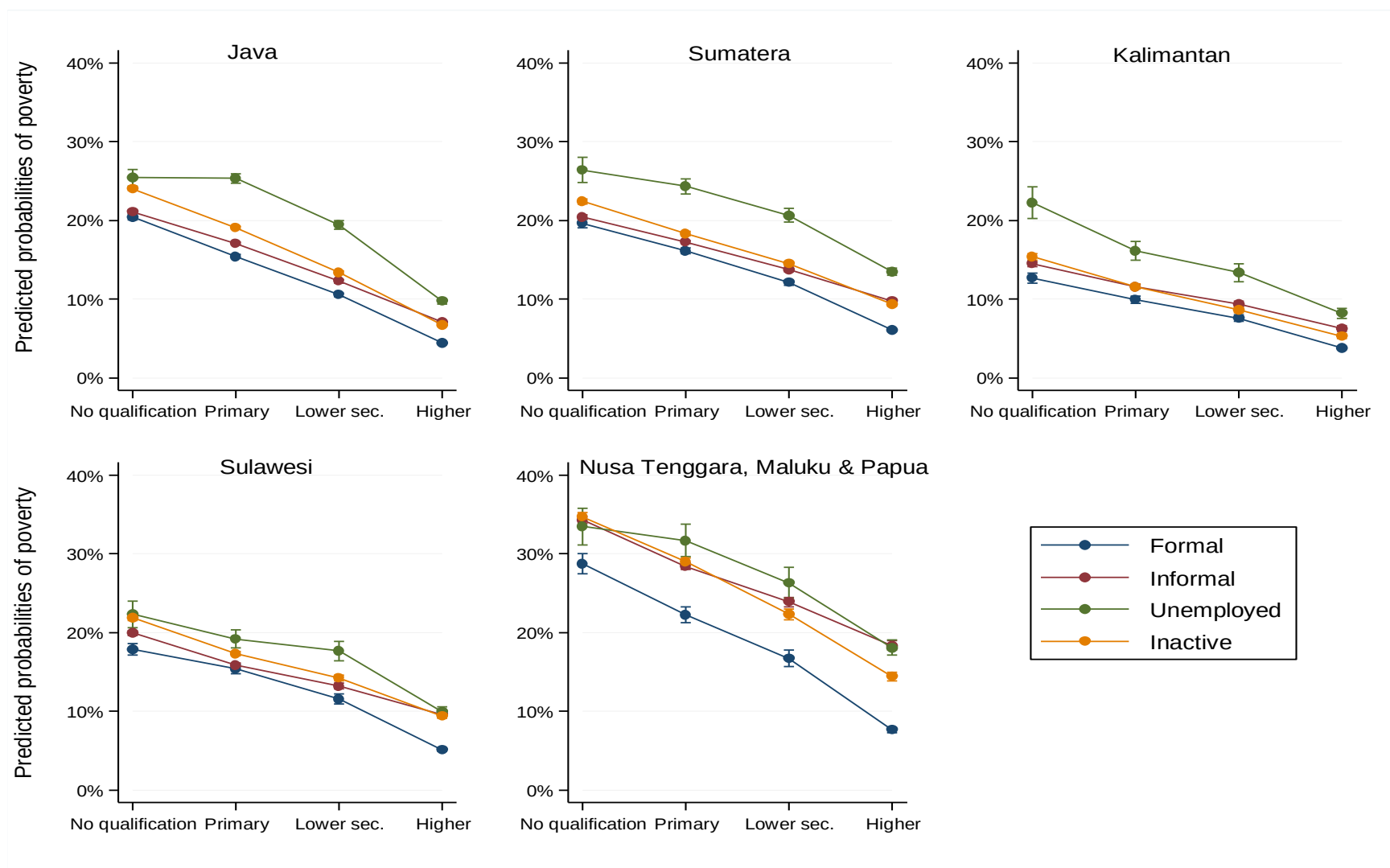
Hypothesis 2: Poorly educated informal workers in less developed regions have a substantially higher risk of poverty than those from better-off regions.

The second hypothesis predicts that poorly educated informal workers are worse off in less developed regions of the country. This is based on the argument that there are more job related opportunities and demand in developed areas of the country such as setting up food stalls and selling handicrafts to tourists. Even if these jobs are of informal nature, they have a permanency feature (i.e.: food stalls continue to exist, traders continue to trade). This suggests a continuation in income generation, even if the income is low, compared to income from farming activities.

A series of logistic regression models were generated by five of the major regional islands: (1) Java, (2) Sumatera, (3) Kalimantan, (4) Sulawesi and (5) Nusa Tenggara, Maluku and Papua. The predicted probabilities of poverty by employment status and level of education was computed from each of the regional models (Model 5a-e, Table D.5, Appendix). The results are illustrated in Figure 4.8. The results do confirm hypothesis 2: poorly educated informal workers are economically more deprived in less developed regions than their counterparts living in better-off regions. The probability of poverty among informal workers with no formal education living in Java is 21 percent, while it is 34 percent for those living in the eastern most region of Indonesia (Nusa Tenggara, Maluku and Papua). Three other points may be summarized from Figure 4.8.

First, a comparison between the formal and informal workers show the probability of poverty is higher among informal workers than formal workers, at all levels of education. More importantly, we note that in the eastern region of the archipelago (Nusa Tenggara, Maluku and Papua) the probability of poverty is substantially higher for informal workers than formal workers, when compared to all other regions. This seem to suggest that the working poor argument holds higher relevance in the less developed regions than in economically advanced regions of Indonesia. In addition, the gap in probability of poverty between formal and informal workers is narrower at the lower end of the education spectrum. This suggests that the risk of poverty is quite similar among formal and informal workers at the lowest levels of education.

Figure 4.8. Predicted probabilities of poverty by individual's level of education and employment status, by major regional islands, Indonesia, 2000-2009



Second, in majority of the provinces, the probability of poverty is the highest for unemployed individuals lacking formal education compared to all other combined groups of education and employment status. However, there is exception to this trend. In the least developed eastern region of Sulawesi, Nusa Tenggara, Papua and Maluku, the probability of poverty among someone who is unemployed is almost comparable to that someone who is engaged as informal worker if they lack formal education. This may be explained by the nature of informal work among the poorly educated living in the eastern region. Most informal workers are engaged as small-scale farmers. The work itself is of seasonal nature and returns are usually minimal or at subsistence level.

Finally, the regional results show that the probability of poverty is the highest for all combined groups of education and employment status in the least developed eastern region of Nusa Tenggara, Maluku and Papua than for individuals with similar characteristics living in all other region.

In support to the general findings (Figure 4.5), findings by gender (Figure 4.6) and findings over time (Figure 4.7), it is evident that those who are unemployed are also consistently the most vulnerable across the regions of Indonesia.

4.5 Discussion

The results confirm that education strongly determines poverty, independently of employment status. The association between an individual's level of education and poverty outcome remain very stable, even when their employment status is taken into account. Part of this association may be explained by the positive linear relationship between education and wages in Indonesian society (Purnastuti et al., 2013). Since income plays a major role in preventing individuals from falling poor, it is not surprising that individuals are very likely to experience poverty when they and their household members lack formal education.

A major finding is the vulnerable position of unemployed Indonesians. This comes in contrary to the first hypothesis raised in this chapter, which is that the risk of poverty is higher among informal workers. The unemployed have the highest risk of poverty at any given level of education, and the risk is higher compared to those in informal employment. The finding is a highlight because it is contrary to the unemployment literature in Indonesia.

In Indonesia, unemployment is often dismissed as having little relevance to poverty because unemployment afflicts the majority tertiary educated individuals whose families are better off. Indeed, descriptive numbers do show that unemployment is at 7 percent for graduates and 1 percent among those lacking formal qualification. But the figures from 2000–2009 is also worryingly quite high among those with medium level qualifications, for example 6 percent among those with lower secondary qualification. However, the vulnerability of a sub-population cannot be solely interpreted based on descriptive numbers. By applying regression analyses, this chapter shows that the tiny minority of unemployed individuals occupying the lower tiers of education are highly vulnerable towards poverty. Furthermore the findings are robust by gender, across time and across the major income regions of Indonesia.

The results also suggest that at higher levels of education, the association between employment status and poverty matters more. Those with a lower educational qualification earn lower income, regardless whether they are formally or informally employed. On the other hand, at the top most educational qualification, there is a slight increase in the gap of poverty risk between formal and informal employment, with the latter having a higher risk. In other words, educated informal workers are better-off than informal workers lacking education, but they do far less-better than their counterparts with formal employment. The lack of formal sector jobs for educated Indonesians does little for poverty reduction.

The very narrow differences in risk of poverty among formal and informal workers with minimum years of education are interesting. This trend is more notable among women than men. There may be two interpretations for this particular finding. The first interpretation is the dominant role of education in determining people's risk of poverty. Income levels are more likely very low for the poorly educated, particularly women, independent of their employment status (which in a way is supported by the stable coefficients of education in Model 2 while holding employment status constant). The second interpretation could also relate to the type of jobs occupied by uneducated formal workers, especially women. They are more likely engaged as lowly paid factory workers, security guards or office secretaries/attendants – the very type of jobs that characterize the lower tiers of public services or government sector.

The second hypothesis of this chapter seeks to establish the vulnerability of poorly educated informal workers across the major regions of Indonesia. The results suggest the less developed the place is, the heavier the ‘penalty’ is for those occupying the lower tiers of educational qualification. For most of Indonesia, less than half of school-age children qualify with higher secondary and above qualifications. The figures are lower in the eastern part of the country. So the tiny share of highly educated members occupy positions in the local district and provincial offices while the majority with lower levels of education form the large base of informal employment. In general, the second hypothesis stands true: informal workers lacking formal education are poorer in less developed regions than those with similar characteristics living in developed regions of the country. However, as discussed in the earlier paragraph, on the whole, unemployed individuals face a higher probability of poverty than informal workers.

This study has also demonstrated the vulnerability of those who qualified from the Islamic education stream. They predominantly remain inactive and have higher levels of poverty than their counterparts with similar levels of education but who graduated from the general education stream. It is less clear whether this is because of the nature of the schooling that does not cater to existing jobs in the labor market or whether there is general discrimination against those with an Islamic education background.

A special interest arising from the analyses of this chapter is the economically inactive population: some one third of the working-age Indonesians are inactive. Descriptive numbers show that those with lower secondary qualification are more likely to be inactive, but those in the lower tiers of education qualification are not too far behind. The trend is prevalent among women than men. In the regression analyses, we find that the probability of poverty is almost comparably high among the inactive population and the unemployed when both groups are lacking formal education. However, the probability of poverty decreases among the economically inactive as their education level increases. This may be because educated individuals, particularly women, may only opt to be inactive under conditions when their household is not at risk of poverty and that there are other household members in good jobs.

The findings of this chapter are robust across alternative measure of poverty. The analyses in this chapter was carried out by replacing the dependent variable – BPS poverty – with the \$1.25 a day poverty.

4.6 Conclusion

The association between an individual's level of education and poverty outcome remains very stable, even when their employment status is taken into account. In other words, a person may have favorable employment status but if he or she lacks formal education, they pay a heavier penalty in terms of poverty outcome than those with education having similar favorable employment status. A substantial share of the primary and lower secondary qualified population is employed as informal workers. Yet their risk of poverty is substantially lower when compared to informal workers lacking formal education. Here one can argue that the informal labor market is highly heterogeneous, with those having education occupying the upper tiers of the informal sector. This to some extent is true, but it is their *higher* level of education that got them those *favorable* jobs even if it is within the informal sector.

Central to this thesis are factors that explain the variation in regional poverty. In this chapter, the 33 provinces of Indonesia were grouped into 5 major regional islands. Findings indicate substantial regional variation in the association between education and poverty outcome. The probability of poverty is substantially higher for someone living in the eastern region of the archipelago than in Java, across all combined groups of education and employment status. For example, a person with the combination of high education and informal work have 18 percent probabilities of experiencing poverty if he or she is living in the eastern region, while it is only seven percent for someone in Java. In other words, despite being equipped with higher educational qualification, a person is not spared from economic disadvantages if they are living in less developed regions.

Most importantly, unemployment cannot be disassociated from poverty experience. By proportion, it may be mostly experienced by those with high levels of educational qualification. But the minority of unemployed workers, in particular those with no formal education face intense hardship. We must also pay attention to the risk of poverty experienced among the unemployed primary educated individuals for they are not too far behind from their unemployed counterparts who lack formal education; as well as among the economically inactive lacking formal education.

Chapter 5

Exploring the Association between Female Headship, Household Demographics and Poverty in Indonesia: Does the Disaggregation of Female Headship Categories Matter for Poverty?

5.1 Introduction

In the last decade, the debate on the economic struggles endured by Indonesian households headed by women has reached a crossroads. One thread of academic discourse suggests that there is no automatic relationship between female headship and poverty when compared to male-headed households (Manning and Sumarto, 2011; Perdana and Maxwell, 2004; Quisumbing, Haddad and Peña, 2001). Another thread suggests that households headed by women are heterogeneous by nature, with households headed by older widows and single mothers tending to have a poorer outcome than other households (Mukherjee, 2002). This suggests that the lack of association is only true when female-headed households are presented as an aggregated measure.

Household theorists such as Youssef and Hetler (1983) and Chant (1997) argue that there are significantly different processes that lead to the formation of female headships. For some women, headship is a permanent status, particularly for women whose marital union has dissolved through legal or informal means or the death of their spouse. In other words, these are female heads with *de jure* (actual or permanent) status: they live without a male partner, are economically independent and primarily responsible for young children, if there are any. On the other hand, for some women the status of headship is temporary: the wife is more likely to take on the *de facto* (temporary) leadership of the household when men migrate for work. In these households, men are usually involved with the household finances through the transfer of remittances and are engaged with the well-being of household members through telephone contact or intermittent visits.

The distinction between *de jure* and *de facto* status of female headship matters for poverty outcome. Elsewhere, such as in the Philippines, female-headed households with *de jure* status are found to be economically worse off compared to male-headed households, as well as when compared to their *de facto* female counterparts (Chant, 1997).

The explanation here is that male-headed households tend to be economically better off because they have more income-generating members, while remittances play a vital role in keeping *de facto* female-headed households in a wealthier position.

However, when it comes to the discussion of poverty, it is also important to single out the position of *de jure* women who are divorced or separated from those who are widowed. In general, studies from post industrial countries examining the effect of divorce on women's economic well-being show evidence that women's economic vulnerability increases following their marriage dissolution (Uunk, 2004; Smock, Manning and Gupta, 1999). However, in the context of Indonesia, there is much less work on divorce and poverty. Anecdotal evidence suggests that female divorcees are economically vulnerable because divorce means that many women lose their male breadwinners. A higher proportion of female divorcees also tend to have minimum levels of education. This may relate to the fact that less educated women tend to be married off at an early age and are less likely to choose their partners than women with higher levels of education (Heaton, Cammack and Young, 2001). Hence, it is not surprising to find a positive association between lack of formal education and marital instability. The combination of lack of education and work-related skills places female divorcees in a disadvantaged position in the labour market. Furthermore young divorced mothers also bear the dual role of managing a job and caring for their young children.

Widowed women, on the other hand, may be better off because they are older and are likely to have adult children whom they could turn to for financial support (Cameron and Clark, 2008). Widows are also more likely to inherit their deceased husband's property or land or livestock (in the case of rural Indonesia). Hence, this potentially places them in an economically better position when compared to households managed by young divorced mothers. However, a counter argument could be that widows who lack financial support from family members may have comparable levels of poverty to that of divorcee mothers. Furthermore widowed female heads are more likely than others to lack formal education because their growing years would have been characterised by a combination of factors that would have kept them out of schooling such as lack of schooling infrastructure, the absence of universal schooling policies and social norms that keep girls at home.

Moving beyond the Southeast Asian region, there are scatters of case studies that indicate a poorer outcome for households headed by *de facto* women heads. For example, in rural Kenya, *de facto* female-headed households are found to be significantly worse off than male-headed households (Kennedy and Haddad, 1994). Case studies indicate that it is not always a rosy story of success for men working abroad or who have migrated from rural interiors to congested cities of a country. Most of these men are engaged in casual jobs and are unable to send regular remittances to their households. Back home, as *de facto* head, the wife struggles with household expenses, as well as with debts taken on to pay the agents arranging jobs for their emigrating husbands.

Evidently, the existing international evidence on the poverty status between the different types of female headships and their comparability to male-headed households is mixed, while in the Indonesian archipelago it remains unexplored. One may ask: why should one focus on these households? An important answer is that the set of female-headed households forms an integral part of Indonesian society for its numerical size. They make up some 12 percent of the estimated 60 million households in Indonesia. They are a minority, but an undeniably important one. Moreover, the subject of disaggregation among female headships is of particular relevance in Indonesia given the dynamic internal and international migration of its labour force that was exacerbated by the 1997–98 financial crisis. Since 2000, Indonesia has emerged as one of the world's largest providers of overseas workers (Hugo, 2002) as well as of rural-urban migration, suggesting a rising prevalence of single headship households.

For the reasons above, it is crucial to ask the question of what actually may be occurring among the different types of female headships and how the trend differs across the subnational regions of Indonesia. The first research question of this chapter is: *Do female headships with de jure status, particularly among women heads who are divorced, experience a higher risk of poverty than all other types of household?* The second question investigates the extent to which the poorer outcome among female-headed households varies across the Indonesian archipelago: *Is the risk of poverty higher in households headed by female divorcees in less developed regions when compared to their counterparts living in more developed regions of the country?*

There is some evidence to suggest that female-headed households have a poorer economic outcome (Chant, 1997) and this may be to some extent explained by women's weaker position in the labour market through their higher rates of unemployment (Dhanani et al., 2009), non-farm informal work (Effendi and Manning, 1994) and inactivity.

Furthermore, *de jure* female households are less likely to have additional adult members within their household, suggesting that these households lack the option of sending a family member to search for work further afield when work is not available in their locality (Mukherjee, 2002). Poverty is likely to be prevalent among these households because of the combined demands of work and family care. In contrast, for the majority of the Indonesian couple households, men work away from the home and women are responsible for household care (Jones, 2004), suggesting some degree of shared responsibility.

It is useful to note that very little is known of the employment characteristics of the female headship groups in Indonesia. Even less is known of their combined work and family responsibility role. In addition, therefore, this chapter analyses to what extent the poverty experienced by female headships varies by their employment status and child care responsibilities.

This is the first known study to systematically investigate how measures of poverty co-vary with the distinctive types of female headships using data that is subnationally representative. The research questions are explored using a series of cross-sectional datasets: the National Socioeconomic Survey of Indonesia (SUSENAS in its Indonesian acronym), 2000–2009.⁷⁹ The rest of this chapter is organised as follows. The next section presents the literature review and hypotheses. The review of the literature resulted in the formulation of two specific hypotheses. The following section details the methods and data. Next is the results section. This section starts off with the presentation of descriptive results, followed by analyses of the hypotheses. The final two sections cover the discussion of the results and the conclusions of this chapter.

⁷⁹ An exception to this decision is the 2008 survey data. Information on household expenditure was not collected as part of the SUSENAS Core 2008. So I have drawn data from the SUSENAS Module (Expenditure and Income) 2008. The sample size for 2008 is much smaller compared to other survey years. However the weighting of the sample, developed by BPS, allowed for the variables to be comparable to the core sample.

5.2 Literature review and hypotheses

5.2.1 Female-headed households and poverty

The feminisation of poverty theory holds that households headed by women are disproportionately represented among the poorest of the poor. Studies emerging from the 1990s supported this argument of the feminisation of poverty both conceptually and empirically. In consolidating the available evidences, Buvinić and Gupta (1997) review 61 articles that examined the relationship between female headship and poverty using nationally representative data covering a timeline between 1986 and 1994. By using a variety of poverty indicators, 38 of the 61 articles found that female-headed households are overrepresented among the poor.⁸⁰ Fifteen other studies found that poverty was associated with certain types of female heads, or that the association emerged only for certain poverty indicators. Only eight of the 61 articles showed no empirical evidence for the hypothesis of the greater poverty of female-headed households. Based on their review, Buvinić and Gupta (1997) conclude that female-headed households are disproportionately represented among the poor.

On the other hand, Chant (2006) finds that while in general women in Latin American countries are poorer than men (using income measure), the differences are fairly marginal and the differences are only found in the rural areas.⁸¹

In contrast, empirical studies emerging in the late 1990s and 2000s have shown that women-headed households are not an automatic outcome of poverty. Quisumbing et al. (2001) find weak evidence for the feminisation of poverty based on their empirical analyses involving 10 developing countries using multiple classes of poverty measure (including incidence and intensity). Among the countries studied, only in Ghana and Bangladesh did the stochastic dominance analyses indicate that women-headed households (household-level analyses) and women (individual-level analyses) are consistently worse off. In all other countries, including Indonesia, their findings indicate that female-headed households are no more likely to be in poverty than male-headed households. An important critique of Quisumbing et al.'s work is that it does not take into account the variations within female-headed households.

⁸⁰These poverty indicators include *per capita* household income, mean income per adult equivalence, *per capita* consumption expenditures, and access to services and ownership of land and assets, among others.

⁸¹ In 10 out of the 17 countries studied (specifically Argentina, Bolivia, Brazil, Chile, Colombia, Guatemala, Honduras, Mexico, Paraguay and Uruguay), the proportion of men in poverty in urban areas is actually on par with or slightly higher than that of women.

Similarly, using individuals of 15 years and older as the unit of analysis, Lipton and Ravallion (1995) conclude that women are not generally overrepresented in consumption-poor households when compared to men. They do state, however, that while consumption-poverty incidence is not greater amongst women, they (women) are poor in other respects (Lipton and Ravallion, 1995: 2589). Suryahadi (2012) and Mukherjee (2002)'s work provides some support to the latter part of Lipton and Ravallion's argument. Using the gender-related development index – an index that takes into account multiple deprivations faced by individual men and women – Suryahadi finds that Indonesian women lag behind men when their purchasing power and human development capabilities are taken into account. Mukherjee (2002:182) finds entrenched gender inequalities at both the community and household level, affirming that women's lives are twice as insecure as men's.⁸²

The work by Suryahadi and Mukherjee highlights the limitations of Lipton and Ravallion's work. The latter used household level data to understand individual level welfare. Most women live in households headed by men. Since consumption expenditure is collected at the household level, the data contributes very little to our understanding of the differences in poverty risk between individual men and women. Despite appearing as non-poor by household standard, the reality is that there is substantial gender inequality within households (Platt, 2006). In the context of Indonesia, Suryahadi and Mukherjee's work are examples that suggest gender disparity within households, but the extent of this disparity remains unknown. One other way to address the limitations of Lipton and Ravallion's work is to shift the unit of analysis to the household level. In other words, by contrasting the well-being of male and female-headed households and the variations within the group – as this chapter does – we will be able to contribute substantially (and realistically) on the subject of gender and poverty in Indonesia.

⁸² This particular conclusion was based on participatory discussions and in-depth interviews with men, women and youths across 12 communities from the islands of Java and Nusa Tenggara of Indonesia.

5.2.2 Female headship: *de facto* versus *de jure* status

Female-headed households are generally defined as households where no husband or male is present. However, the lack of male headship may be either a permanent or temporary status. Women who have lost their spouses through death or separation usually take on the role of the primary decision-maker of the household: that is, the *de jure* headship. In other words, women in these households live without a male partner on a permanent basis and mostly receive no economic support except in cases of child maintenance. Even then, in countries such as Indonesia, it is more likely that majority of the single mothers are the primary provider for their young children, given that the enforcement and receipt of child support is extremely weak when compared to countries of advanced economies (Heaton et al., 2001).

On the other hand, women assume temporary headship or *de facto* headship when husbands or partners migrate away from their household for employment on a temporary basis (Jones, 2004; Chant, 1997). Here the definition of ‘temporary’ is flexible, for it could mean that men are absent from their households for a time spanning anywhere between months to years. Despite being away, husbands are reported to still play important role in household decision making such as children’s education, as well as contributing to varying degrees to household incomes (Chant, 2008; Hugo, 2002; Kennedy and Haddad, 1994). In most cases, men tend to resume headship of the household upon their return (Chant, 1997).

Case studies covering urban areas of the Philippines show that *de facto* female headships are less likely to fall into poverty due to the regular remittances sent by their husbands or elder sons working abroad (Chant, 2008). The study also shows that, over time, *de jure* female-headed households remain significantly poorer than all other types of households. However the study does not make a distinction between widows and divorcees: both make up the *de jure* status headship.

5.2.2.1 Widowhood and poverty

Chen and Drèze (1995) empirically demonstrate that in India, widowhood is a cause of economic deprivation. Female widows are less likely to have a pension income and often depend heavily on the economic support of their sons, who themselves have limited financial resources. However, findings using a series of DHS (Demographic Health Survey) data spanning 24 countries in the African region show that the presence of adult children

(particularly male) tend to place single headship households in a better economic position (Milazzo and van de Walle, 2015). In other words, the additional human capital resources that exist within single headship households matter for the well-being of these households.

5.2.2.2 Divorce and poverty

Longitudinal studies from post industrial countries examining the effect of divorce on women's economic well-being show evidence that women's economic vulnerability increases following their marriage dissolution (Uunk, 2004; Smock, Manning and Gupta, 1999). However, the risk of poverty varies according to factors such as the presence of state welfare policies for single parents and child-care.

In Indonesia, the Marriage Law and the Compilation of Islamic Law describes the husband as the head of the family, responsible for supporting and protecting it, while the wife is responsible for domestic matters (Cammack, Young and Heaton, 1996). Consequently, divorce means that many women lose their male breadwinners. Women are confronted by the fact that they have to find their own employment and source of income after a long period of absence from the labour market. Furthermore, a higher proportion of women who are divorced or separated from their spouse tend to have minimum levels of education. This lack of education and work-related skills suggest they have lower chances of getting recruited compare to other jobseekers. Furthermore, child benefits have lower relevance in the Indonesian society. In the event of divorce, Article 41 of the 1974 Marriage Law requires the husband and father to be responsible for his children's well-being and education post-divorce, and states that the court has the right to order the husband to provide financial support to his former wife (Cammack et al., 1996). However, enforcement mechanisms are difficult to access and so poorly enforced that single mothers are often deprived of child support and maintenance claims (Heaton et al., 2001).

Following the discussion above, this chapter predicts that: *The risk of poverty is higher in households headed by female divorcees than all other households* (Hypothesis 1).

5.2.2.3 Regional effect

In less developed areas, the limited infrastructure impedes women's economic opportunities. The poor quality of schooling means women lack the opportunity to develop marketable skills, which in turn severely limits their participation in the formal economy. As a result, many women in the poorer regions of the country are almost exclusively confined to the informal sector. In cases where women pursue home-based enterprises, the work yields low productivity and earnings (as in the case of women in Waikanabu, East Nusa Tenggara, mentioned in Chapter 1).

Farming as means of livelihood is prevalent in the impoverished eastern areas of Indonesia. This suggests that the uncertain returns from employment are a much more serious issue in this part of the country. Women's groups from the eastern island of Nusa Tenggara also voiced the fear that single mothers and widows are at a disadvantage because they lack the option of sending family members to seek work outside the locality (Mukerjee, 2002). We may thus expect that: *Households headed by female divorcees have a higher risk of poverty in less developed areas than their counterparts living in more developed regions of the country* (Hypothesis 2).

5.3 Data, variables and methodology

5.3.1 Data

Data from SUSENAS 2000–2009 was used to test the hypotheses. The SUSENAS is an annual cross-sectional household survey administered by the Central Bureau of Statistics Indonesia (BPS in its Indonesian acronym). The survey consists of a yearly core component and one of three alternating modules on (1) culture and education, (2) housing and health, and (3) household consumption expenditure and income, each administered once every three years. This chapter has utilised data from the core component.

Previous studies in the field of poverty have popularly used data from the consumption expenditure and income module survey. This is because the module survey collects much more comprehensive data on consumption and expenditure than the core survey does. However, there are two reasons for using data from the SUSENAS Core in this chapter rather than the SUSENAS Module. First, data from the core component permits precise annual inferences to be made at the subnational levels, while data based on module is collected

triennially. Second, the Core survey covers a larger sample (some 200,000 household annually) than the Module (some 68,000 households triennially). Given that the focus of this chapter is on female-headed households, a small sub-population in any given society, having a large sample is useful. The SUSENAS sample follows a multi-stage stratified random sampling design, stratified by urban and rural location.

5.3.1.1 Unit of analysis

An important question raised in this chapter is to what extent poverty varies across the different types of female headship, and whether selected categories of female headship are worse off than male-headed households. The empirical interest here is thus at the household level. In other words, a single observation per household (that is, household head) was engaged as the unit of analysis.

5.3.1.2 Sample size

The final analytical sample consisted of a total of 2,260,881 households. The minimum age of the household head was 15 years, while the oldest was 90 years. Some 0.5 percent households were dropped from the initial sample. The majority of the households that were dropped showed demographic patterns that were similar to boarding homes for groups of students or rural-urban migrants who may be living with a group of people to whom they are not linked by family ties. These households have very different roles and responsibilities compared to regular households. In addition, as pointed out by Lloyd (1999), the assumption of resource pooling within these households is particularly problematic. Hence it was appropriate to drop these households from the sample.

In addition, households with heads who are 14 years and younger were dropped from the sample because a substantial number of the young heads reported schooling as their primary activity, suggesting that they may have stood in as proxy heads in the absence of their parents. Female-headed *couple* households were also dropped from the analytical sample, and further explanation on why this was done for this particular sub-population is given in section 5.3.2.1.4. It is also useful to note that the number of observations that make up these problematic groups are very small, hence reducing the likelihood of any useful analysis.

5.3.2 Variables

5.3.2.1 Key independent variable: type of household headship

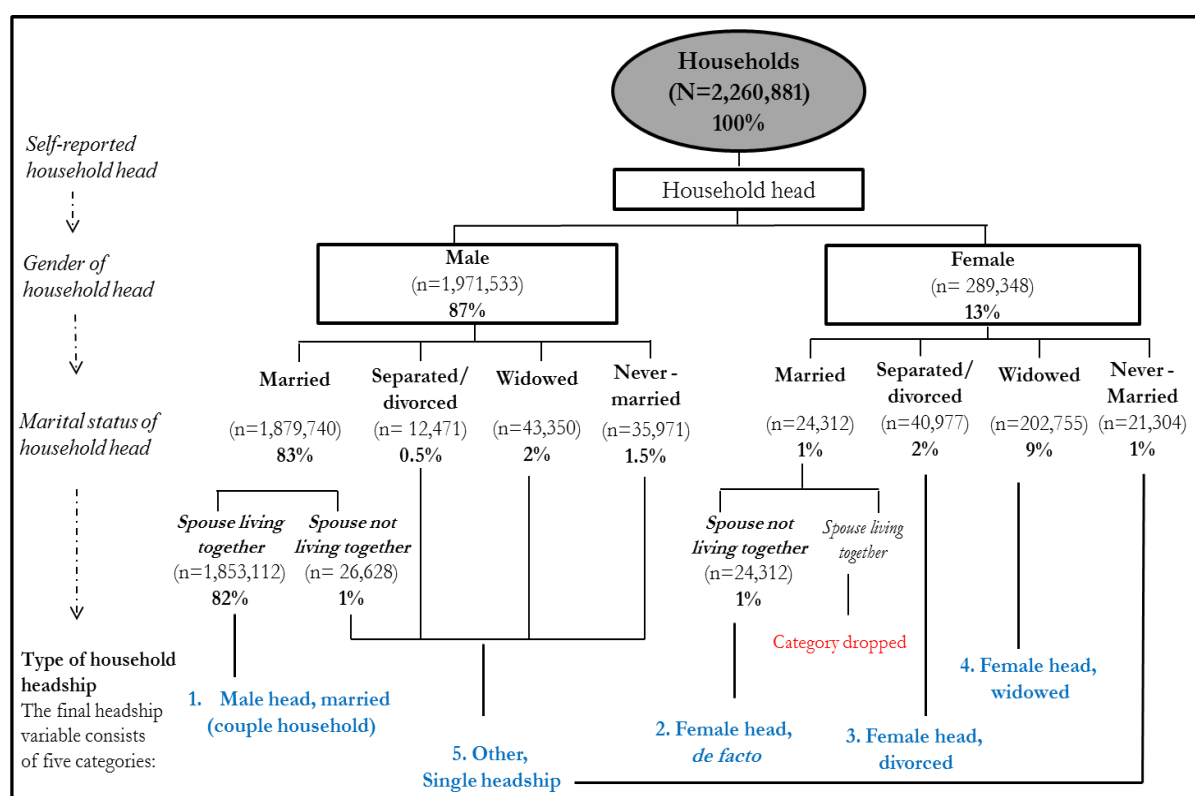
This chapter moves beyond the binary category of male and female-headed households that is usually adopted in studies related to household headship. The type of household headship variable constructed and applied in this chapter consists of five categories: (1) Male head, married (couple household); (2) Female head, *de facto*; (3) Female head, divorced; (4) Female head, widowed; and (5) Other, single headship. The steps involved in constructing the five-categorical-variable using the combination of variables on self-reported headship, gender and marital status are summarised in Figure 5.1.

5.3.2.1.1 Self-reported headship

In the SUSENAS survey, household head is a self-reported category. Household members typically acknowledge the main provider or the oldest member as the head of the household. The first critique is the mixed definition of headship used in the survey, that is, economic status versus age hierarchy. The latter raises a situation where heads are more likely to be economically inactive, while other household members are the primary provider. Hence in the analysis section, it was important to take the human capital contribution of other household members into account.

The second critique of the headship identification method is that there is a strong cultural preference in most societies to designate men as the household head. This is the case even in families where the men's contribution to household income is either marginal or completely lacking, while women are the primary earners (Bremner, 2010; Youssef and Hetler, 1983). For example, in some 3 percent of the 1,853,112 couple households (where both men and women are married and living in the same household) the women were employed while their menfolk were not working; yet men were still reported as the head of these households. One may argue that this could be because the men were out of employment only temporarily. In a patriarchal society such as Indonesia, therefore, it is not surprising that the traditional role of the man remaining in 'charge' of the household continues despite him being out of employment and unable or only marginally able to contribute to the household finances. A comparison of the differences in wages in dual-income couple households would shed a more accurate light on the extent of mismatch between reported headship and the household primary provider. This was, however, not possible in this chapter due to lack of wage data.

Figure 5.1. Description of the ‘type of household headship’ variable



5.3.2.1.2 Identifying women with *de facto* versus *de jure* headship status

The variation within female and male-headed household is identified by the household head's marital status (as visually summarised in Figure 5.1). In particular, the identification of *de facto* female headship is limited to married female heads whose spouse is absent in the householder's list. The original typology of variation within female-headed households was proposed by Youssef and Hetler (1983) based on the combination of women's self-reported marital status and their spouse's migration information. The data on migration allowed the authors to uniquely identify *de facto* households from *de jure* households by identifying married female-headed households whose husband or partner was away for employment in neighbouring countries or cities.

However, while the SUSENAS has information on marital status for all individuals age 10 years and older, it lacks data on international and domestic migration among householders. While this lack of data prevents us from ascertaining why the husband is absent from the householder's list, it can be assumed that the marital union between the female head and their absent spouse means that the absent male spouse is still responsible for the household to some degree.

5.3.2.1.3 Women with *de jure* headship status

It is also important to note that the pathway towards *de jure* status is distinctively different between divorcees and widows, with the former involving legal or informal separation and the latter involving the death of spouse. Hence in this chapter, women heads who are divorced/separated⁸³ are maintained as separate entities from those who are widows, rather than grouping them together as has been done in previous descriptive studies (e.g.: Manning and Sumarto, 2011; Perdana and Maxwell, 2004).

5.3.2.1.4 Female head, married (couple household)

Couple households that are headed by women were dropped from the analytical sample (highlighted in red, Figure 5.1). This decision was based on three reasons. First, there is the risk that most of the women may have stood in as the proxy household head, given that enumerators were not able to interview the actual household head. In this sub-group, 45 percent of the women are not engaged in employment, while their spouse is employed, and yet the women are identified as the household head. Of course, these women are potentially household heads in the truest sense. But the second reason for dropping this sample – that is, its very small number (n=2,340) – casts doubt on the reliability of the results for this particular sub-group. Third, any effort to re-group the category with other female-headed categories means grouping two extremely different sub-populations together, resulting in uncertain findings. Based on this reasoning, this particular sub-group of female headship was dropped from the analytical sample.

5.3.2.1.5 Five categories of household headship

Table 5.1 presents the percentage and frequency distribution of the five major categories that form type of household headship in Indonesia. The majority (82 percent) of the households in Indonesia are headed by married men whose spouse lives in the same household, forming what is otherwise also known as the couple household.

Some 18 percent of the households in Indonesia are single headship households. Of this, 13 percent of the households in Indonesia are headed by women, suggesting that female headship makes up a significant minority.⁸⁴ Almost one in every 7 household in Indonesia are

⁸³ Hereafter, for simplification purpose, the category is referred to as '*de jure* divorced'.

⁸⁴ The figure also includes 1 percent of households headed by unmarried women, who are grouped under the 'Other, single headship' category.

headed by women. On average, between 2000 and 2009, some 11 percent of the households in Indonesia are headed by women with *de jure* status. In particular, an overwhelming majority of these *de jure* households are headed by female widows (9 percent). Comparatively, only some 2 percent of the households are headed by widowed men (as shown in Table 5.1). Much of this trend may be explained by the sex differentials in mortality rates (men die younger than women) which results in a large pool of older widowed women taking on the leadership of their households.

Table 5.1. Percentage and frequency of distribution (weighted)
of type of household headship, Indonesia, 2000–2009

	Percent	Number of households
Male head, married (couple household)	82	1,853,112
Female head, <i>de facto</i>	1	24,312
Female head, divorce (<i>de jure</i>)	2	40,977
Female head, widow (<i>de jure</i>)	9	202,755
Other, single headship	6	139,724
Total	100%	2,260,881

5.3.2.2 Dependent variable: poverty following the BPS approach

Poverty measured using the BPS approach is covered in detail in section 2.2 of Chapter 2. A summarised version of the content in Chapter 2 is presented in this section.

Adjusted monthly household consumption expenditure as welfare indicator

In Indonesia, household consumption expenditure is the accepted welfare measure for three reasons. First, the SUSENAS Core survey collects detailed household consumption expenditure data compared to household income data. Second, income data is likely to be under-reported because it is based on a single question in the Core questionnaire: *what is the wage/ salary (money and goods) usually received during the month from the main job?* Third, income data is collected only from individuals engaged in wage employment, hence excluding some 60 percent of the working-age population engaged as informal workers. Following these reasons, household consumption expenditure data is seen as more representative of an Indonesian's welfare compared to income data.

An important adjustment was carried out to the household consumption expenditure data applied in this thesis. The adjustment was necessary because expenditure data from the SUSENAS Core survey is under-reported as it covers only some 15 aggregated food items (Table B.1, Appendix) and six aggregated non-food items (Table B.2, Appendix). In contrast, consumption expenditure data from the Module survey covers some 215 specific food items and 90 specific non-food items. The World Bank (2014:18) observes that when the consumption expenditure questions are more detailed, respondents are likely to remember in more detail and to report higher spending.

Given the issue above, it was necessary to adjust the mean household consumption expenditure data from the core survey similar to the mean published from the module survey. As a result, poverty estimates based on the adjusted consumption expenditure data were similar to the official figures published by BPS.

Converting household-level welfare to per person welfare

The adjusted monthly household expenditure data is transformed to represent a per person measure using the *per capita* approach, that is, the data is divided by household size. By this approach, it is assumed that every member within the household has the same equivalent level of welfare. In the context of Indonesia, the *per capita* scale is more relevant than other equivalence scales that adjust for differences in adult-child needs and/or economies of scale. This is because the BPS regional poverty lines applied in this thesis are based on a *per capita* approach as well. It is only realistic to apply a *per capita* line on welfare data that is adjusted using the *per capita* approach. More importantly, additional analysis undertaken on the application of various equivalence scales show unrealistic low poverty levels when compared to the more common *per capita* scale (see section 2.3.2 of Chapter 2).

Applying province-level poverty lines to identify the poor

In the final step, Indonesians are identified as poor when their adjusted per person monthly consumption expenditure is below the BPS poverty lines. The BPS poverty line represents the minimum monthly cost that is required to meet a person's food and non-food needs. The food expenditure is anchored to the cost spent on 52 food items to attain 2,100 calories per person per day, complemented by the cost to purchase a pre-determined basket of 26 non-food items for rural and 27 items for urban (Priebe, 2014). The total cost for the food and non-food

basket is derived using the expenditure data of a reference population, specifically the 20 percent of the population who are just above the previous year's poverty line (BPS, 2009).

Since prices of goods and services vary across the archipelago, poverty lines are developed for rural and urban areas by province. The lines are then indexed to the price level in Jakarta, such that the cost of the basic needs is comparable across provinces. In other words, regional disparities in consumption arise only because of differences in consumption patterns and prices, and not because of differences in income levels (Miranti, 2010:80).

5.3.2.3 Control variables

Region of residence and socioeconomic status (employment status,⁸⁵ education and age group) of the household head was included as control. In addition, measures on employment ratio and average years of schooling of other household members were introduced. It was necessary to include the human capital of other householders because the definition of household headship is not limited to the main economic provider, but also includes those household heads identified on the basis of age (the oldest household member is identified as the head regardless of whether he or she is the primary provider).

Employment ratio was computed using all other adult household members excluding household head. For example, in a household where there are three adults – household head, spouse and adult child – the total other household members is two. Assuming that, among the two other household members, only the adult child is working, then the employment-to-other-adult ratio is 0.5 (one other working adult divided by two other household adults). For households where no adults are in active employment, then the ratio takes a value of zero; while a household where all adult members are in employment, the ratio takes a value of one.

Average years of schooling⁸⁶ of other household members, which proxies for the differences in household level resource, was also included in the model. More years of education among other household members suggests they are in a better position to contribute positively to household resources.

⁸⁵ The construction of the employment status variable is reported in section 4.3.2.2 of Chapter 4.

⁸⁶ The construction of the years of schooling variable is reported in footnote 74 of Chapter 4.

Finally, the number of young children in a household was also taken into account. Children are defined as being 18 years and younger. The definition excludes those aged 10–18 who are in full-time employment, as they are accounted for under the employment ratio variable.

5.3.3 Models

This chapter uses logistic regression to test the hypotheses.⁸⁷ The dependent variable, poverty, is a dichotomous variable (1=Poor household; 0=Non-poor household). Assuming that poverty is a function of the type of household headship, then the model specification is as follows:

$$\begin{aligned} \text{Poverty}_h = & \alpha + \beta_1 \text{Male_head_married}_h + \beta_2 \text{Female_head_de facto}_h \\ & + \beta_3 \text{Female_head_divorcee}_h + \beta_4 \text{Female_head_widow}_h + \beta_5 \text{Other_head}_h \\ & + \beta_{6-38} \text{Province}_h + \beta_{39} \text{Formal_worker}_h + \beta_{40} \text{Informal_worker}_h \\ & + \beta_{41} \text{Unemployed}_h + \beta_{42} \text{Inactive}_h + \beta_{43} \text{Higher_secondary}_h \\ & + \beta_{44} \text{No_education}_h + \beta_{45} \text{Primary_education}_h + \beta_{46} \text{Lower_secondary}_h \\ & + \beta_{47} \text{Islamic_education}_h + \beta_{48} \text{Age group}_h \\ & + \beta_{49} \text{Employment_ratio_other_members}_h \\ & + \beta_{50} \text{Average_education_other_members}_h + \beta_{51} \text{Number_of_young_children}_h \\ & + \varepsilon_h \end{aligned}$$

where, h= household hth (h₁, h₂, ..., h_n)

The second research question assumes that poverty outcome is a function of the type of headship, but that it varies across the region. A series of logistic regression models were generated by five of the major regional islands: (1) Java, (2) Sumatera, (3) Kalimantan, (4) Sulawesi and (5) Nusa Tenggara, Papua and Maluku. The choice of adopting individual models for each region provided a better overall sense of the trend between the type of household headship and poverty.

⁸⁷ A multilevel logit model was applied for robustness check. The outcome is discussed accordingly in the Results section.

5.4 Results

5.4.1 Descriptive

5.4.1.1 Education and employment characteristics of household head

It is useful to briefly understand the level of education (Figure 5.2) and employment status (Figure 5.3) of the different types of male and female headships before focusing on the question of their economic vulnerability. Descriptive numbers are presented in Table E.1, Appendix.

Figure 5.2 show that almost half of divorced female heads (49 percent) and slightly more than two thirds of the widow heads (67 percent) have no formal education. In contrast, only some 38 percent of *de facto* female heads and 26 percent of married male heads are in similar position. This suggest that *de jure* female heads are less likely to be educated than their *de facto* female and married male counterparts.

Figure 5.2. Percentage distribution of household head's educational attainment by type of headship, Indonesia, 2000–2009

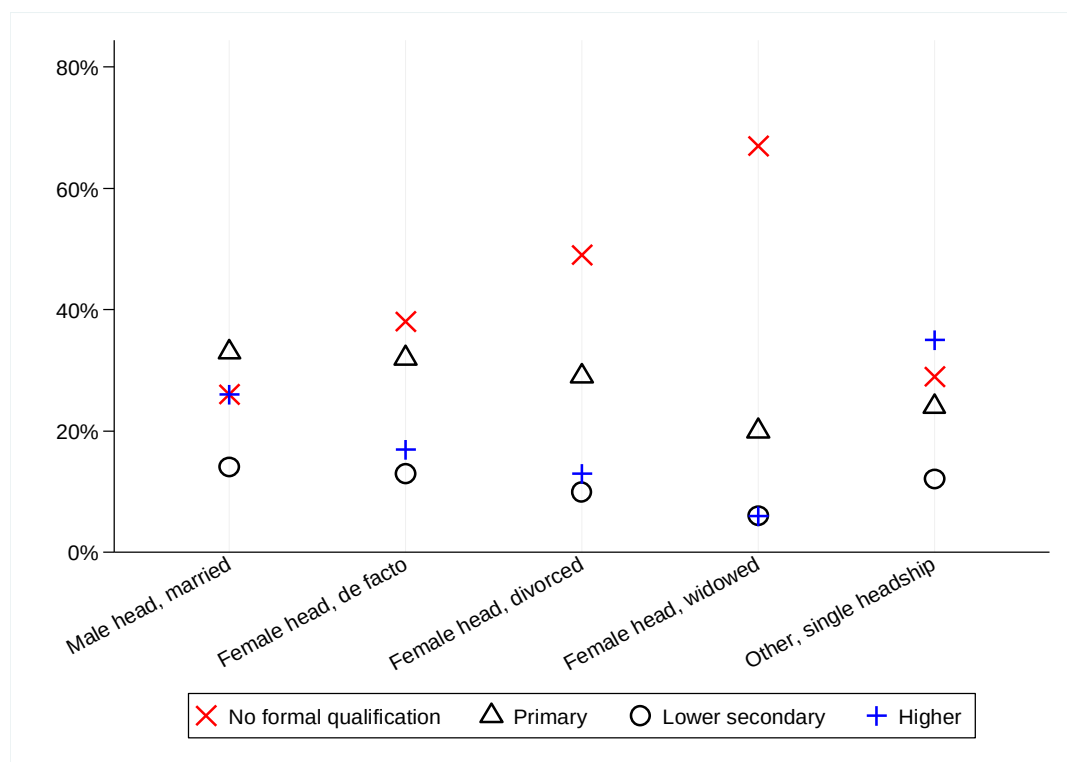
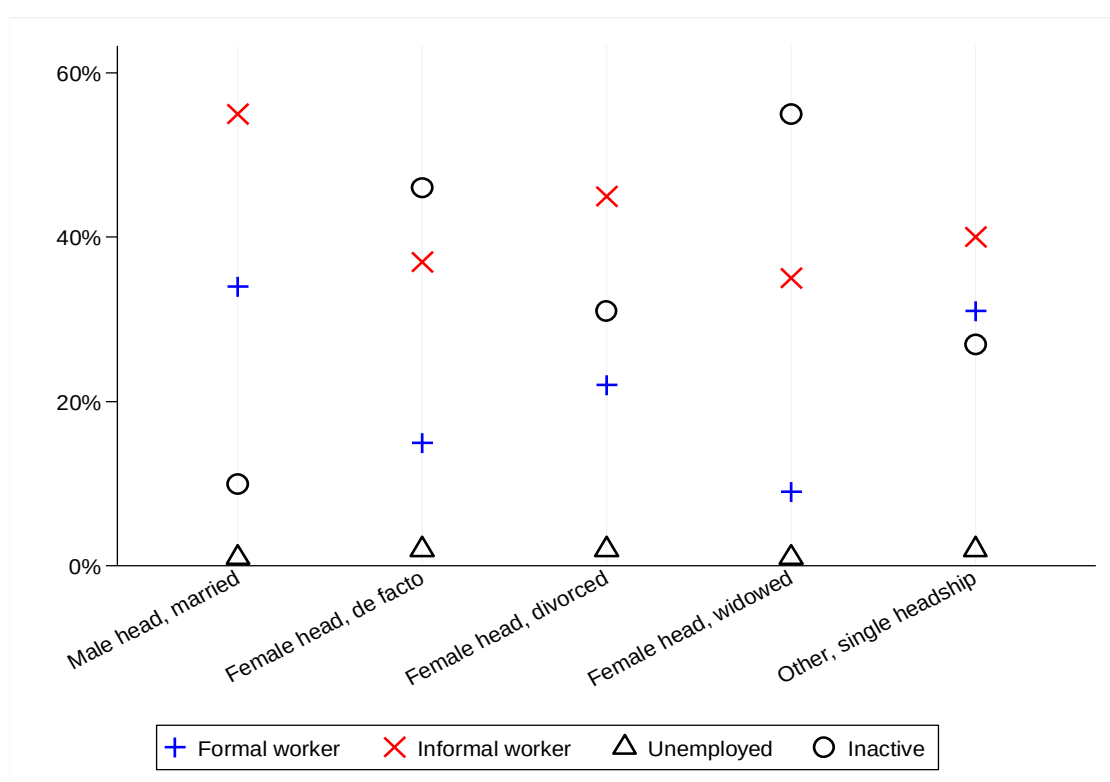


Figure 5.3 show that the large majority of the *de facto* female heads and widows are economically inactive (46 percent and 55 percent respectively). The high rates of economic inactivity among these households may be explained by remittances as their primary source of income, but lack of data limits further analytical exploration. Married men are the least likely to be inactive: almost 90 percent of them are engaged in active employment, with an overwhelming majority engaged as informal workers. Two thirds of the female divorcee headships are engaged in active employment, with half of them engaged as informal workers.

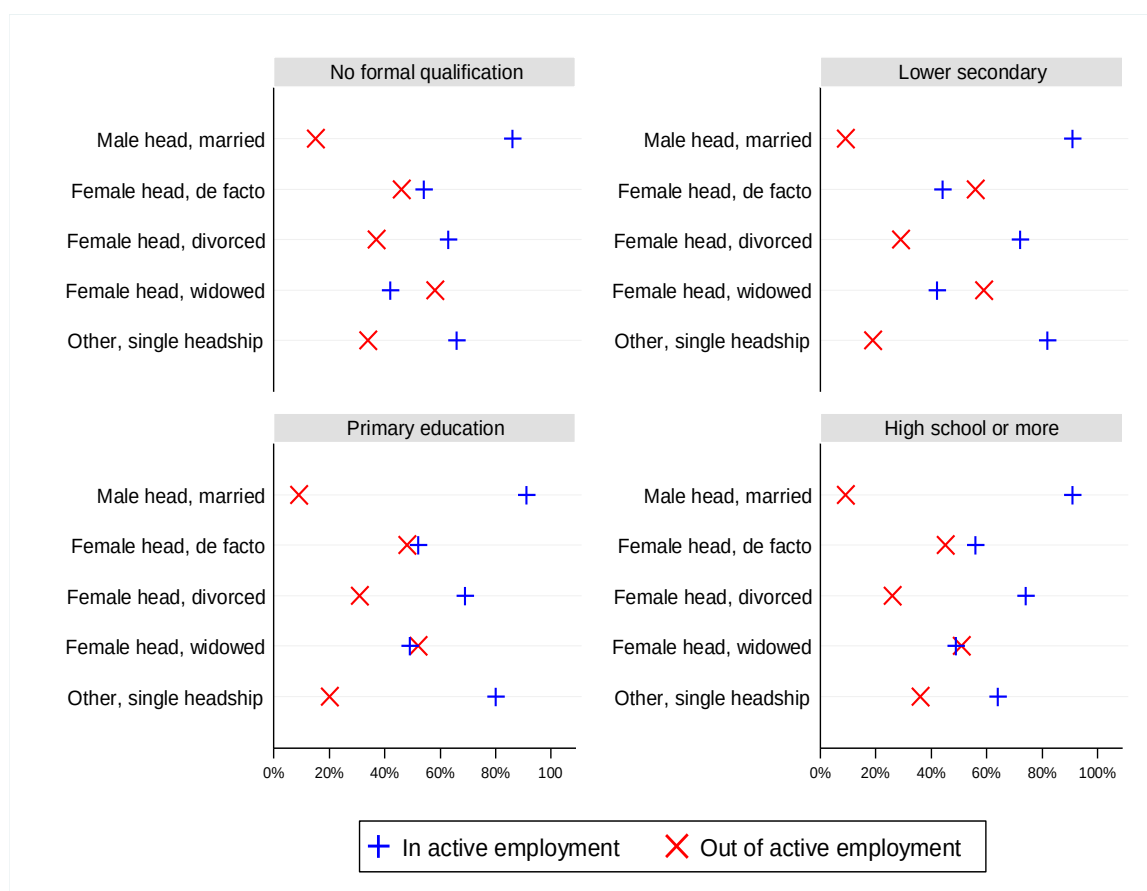
Figure 5.3. Percentage distribution of employment status of household head by type of household headship, Indonesia, 2000–2009



But do most female heads experience poorer employment outcome than male heads at similar levels of educational qualification? Figure 5.4 presents a three-way association between headship group-employment-education. For ease of illustration, employment status is grouped into (1) active employment (consisting of formal and informal workers); and (2) out of active employment (consisting of those unemployed and economically inactive).

The results in Figure 5.4 suggest that, even with similar educational qualifications, female heads are *less* likely to be in active employment than their male counterparts (Table E.2, Appendix). There are two other specific observations. First, independently of their level of education, divorced female heads are more likely engaged in active employment than all other female heads. Second, it is interesting to note the inverse association between education and active employment among *de facto* female heads. This could be that remittances keep them sufficiently comfortable so that more educated *de facto* female heads do not need to work. The lack of information on spouse employment migration limits our understanding of this particular group.

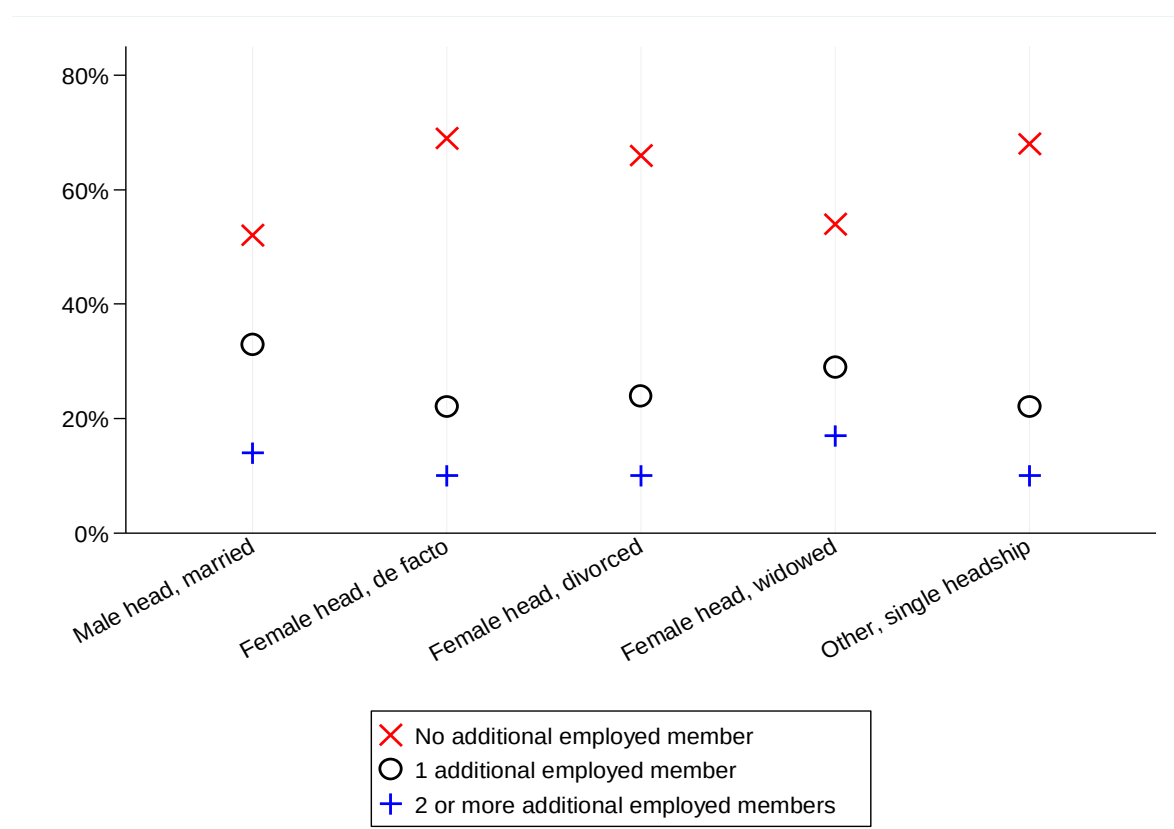
Figure 5.4. Percentage distribution of household head's employment status by educational attainment and type of household headship, Indonesia, 2000–2009



5.4.1.2 Household level demographic factors: other employed members and the presence of children

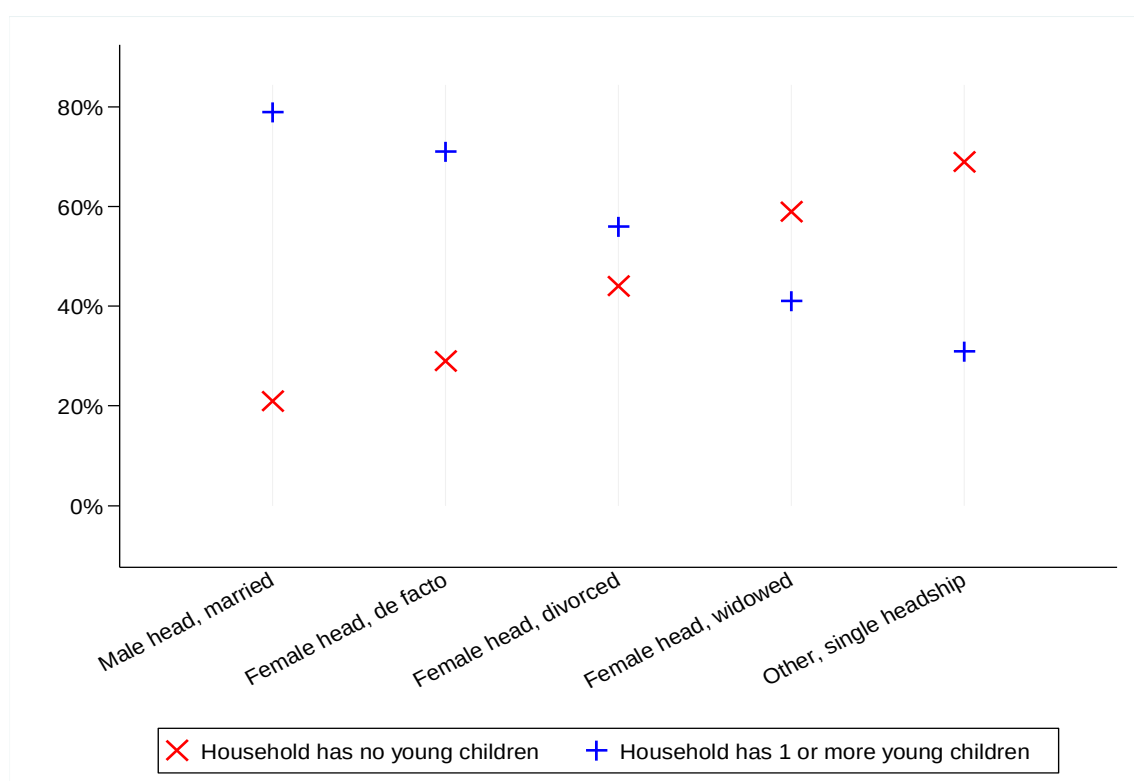
It is also useful to understand how demographic conditions within households vary by different headship. The results in Figure 5.5 show that single headship households are less likely than married male-headed couple households to have additional employed members (Table E.3, Appendix). The only exception is households headed by female widows: these show a comparable number of other household members in employment to that of male-headed couple households. This suggests that in Indonesia, to some extent, households headed by widows are benefiting from the support of their adult children or other adult family members.

Figure 5.5. Percentage distribution of number of other household members in employment (excluding head) by type of household headship, Indonesia, 2000–2009



The results in Figure 5.6 show that households headed by widows are less likely to have young children in their households compared to households headed by married men and households headed by women with *de facto* status (Table E.4, Appendix). Almost four in every five households headed by married men and women with *de facto* status contain at least one young child. Some 50 percent of the households headed by female divorcees have the presence of at least one young child.

Figure 5.6. Percentage distribution of number of children (18 and under) within households by type of household headship, Indonesia, 2000–2009



5.4.1.3 Poverty by type of headship

The aggregate results in Table 5.2 show that poverty is higher in male (14 percent) than female-headed households (11 percent), with the latter having lower poverty than the national average. However, the disaggregated categories of female headship show that poverty is comparable between households headed by married men and households headed by women with *de facto* status. Interestingly, poverty is higher in households headed by women with *de facto* than *de jure* status, but it is useful to note that poverty is only slightly higher in households headed by women with *de facto* status (14 percent) than those headed by women who are divorced (13 percent) or widowed (12 percent).

Table 5.2. Percent (weighted) distribution of household poverty by different types of household headship, Indonesia, 2000–2009

	Percentage of poverty	Number of households
Male head	14	1,971,533
Female head	11	289,348
Disaggregated categories:		
Male head, married (couple household)	14	1,853,112
Female head, <i>de facto</i>	14	24,312
Female head, divorced (<i>de jure</i>)	13	40,977
Female head, widowed (<i>de jure</i>)	12	202,755
Other, single headship household	6	139,724
Average, 2000–2009	13%	2,260,881

5.4.2 Analyses

The question this section seeks to answer is whether the better-off outcome among the female divorcee group compared to the married male and *de facto* female groups persists after taking into consideration (1) the socioeconomic background of the household head; (2) the human capital contribution of other householders; and (3) the number of young children in the household. Finally, the robustness of the results is explored at the regional level. We continue to test the main hypothesis of this chapter:

Hypothesis 1: The risk of poverty is higher in households headed by women with *de jure* status, particularly those who are divorced, than all other households.

Model 1 (Table 5.3) mirrors the results of the bivariate association, as it only includes the type of household headship dummies as the predictor variable. As discussed in the previous section, all female-headed households have lower odds of experiencing poverty than male-headed couple households. The coefficients are significant for all, with the exception of households headed by women with *de facto* status, which show only borderline significant. Households headed by women with *de jure* status (divorcees and widows) show lower odds of poverty than households headed by women with *de facto* status.

Table 5.3. Logistic regression predicting household poverty versus not in poverty, results as odds ratio (N=2,260,881)

	Model 1		Model 2	
	Baseline model		Effect of province of residence added	
Type of headship (ref: male head, married)				
Female head, <i>de facto</i>	0.95*	(0.023)	0.83***	(0.021)
Female head, divorced (<i>de jure</i>)	0.89***	(0.018)	0.88***	(0.018)
Female head, widowed (<i>de jure</i>)	0.82***	(0.008)	0.79***	(0.008)
Other, single headship	0.41***	(0.006)	0.40***	(0.006)
Constant	0.17***	(0.001)	0.30***	(0.004)
Log pseudo-likelihood	-213,000,000		-206,500,000	
Pseudo R-Squared	0.01		0.04	

Note 1: *** and * indicate statistical significance at the 0.1% and 1% level.

Note 2: Coefficients on province dummies (Model 2) are not reported.

The next model introduces province of residence. To keep the table simple, the coefficients of province dummies are not reported but a brief summary of the association between region and poverty is discussed. The odds of a household being poor are between 10 to 19 times higher for households in the eastern area of the country (Nusa Tenggara, Papua and Maluku) compared with households in Jakarta. The inclusion of the residential factor in the model reduces the coefficient for the *de facto* female headship, to the extent that this group now shows lower odds of poverty than households headed by female divorcees. This contradicts the findings based on the bivariate association (Table 5.2), which shows higher levels of poverty among households headed by *de facto* female heads. The coefficients for the group of female widows with *de jure* status are also reduced, increasing the differences between this group and the married male headship group. This suggests there is an important regional influence on these households.

Table 5.4, Model 3 introduces household head's employment status. Unemployment of household heads increases the odds of household poverty, as do household heads who are economically inactive or employed as informal workers. The inclusion of employment in the model reduces the coefficient for the group of female headships only marginally, suggesting that this particular socioeconomic factor explains very little about the differences in poverty between the female headship group and the majority.

In contrast, the inclusion of household head's educational qualification in Model 4 reduces the coefficients of the female headship groups substantially. This suggests that much of the poverty disadvantage among the different groups of female headship, particularly those who are divorced and widowed, is explained by their level of education. There is also a significant gradient in the association between education and the odds of household poverty. Net of other factors, the expected odds of poverty are five times greater for household whose head has no formal qualification than households whose head has a high school, diploma or tertiary qualification.

Table 5.4. Logistic regression analysis of households in poverty versus households not in poverty, results as odds ratio: effect of socioeconomic characteristics of the household head added (N=2,260,881)

	Model 3		Model 4		Model 5	
	Effect of employment status added		Effect of education added		Effect of age added	
Type of headship (ref: male head, married)						
Female head, <i>de facto</i>	0.82***	(0.021)	0.76***	(0.019)	0.71***	(0.018)
Female head, divorced (<i>de jure</i>)	0.86***	(0.018)	0.72***	(0.015)	0.70***	(0.014)
Female head, widowed (<i>de jure</i>)	0.76***	(0.008)	0.59***	(0.006)	0.63***	(0.007)
Other, single headship	0.40***	(0.006)	0.42***	(0.006)	0.44***	(0.007)
Employment status of head (ref: formal worker)						
Informal worker	1.76***	(0.012)	1.19***	(0.009)	1.22***	(0.009)
Unemployed	2.06***	(0.053)	1.76***	(0.047)	1.79***	(0.048)
Economically inactive	1.44***	(0.014)	1.03**	(0.010)	1.18***	(0.013)
Education of head (ref: higher secondary or more)						
No formal qualification			5.00***	(0.051)	5.50***	(0.057)
Primary qualification			3.75***	(0.038)	3.86***	(0.039)
Lower secondary qualification			2.33***	(0.027)	2.36***	(0.028)
Type of education of head (ref: national qualification)						
Islamic qualification			1.24***	(0.020)	1.22***	(0.020)
Age group of head (ref: 30–49 years)						
15–29 years					0.73***	(0.007)
50–69 years					0.68***	(0.004)
70 years and more					0.67***	(0.008)
Constant	0.20***	(0.003)	0.10***	(0.002)	0.11***	(0.002)
Log pseudo-likelihood	-204,700,000		-198,000,000		-196,800,000	
Pseudo R-Squared	0.05		0.08		0.09	

Note 1: ** and *** indicate statistical significance at the 1% and 0.1% level.

Note 2: Coefficients on province dummies are not reported.

The household head's age group (Model 5) has a negative association with poverty at both extremes: households headed by young and older individuals show lower odds of poverty compared to households headed by mid-age adults. The increase in the coefficient of female widows suggests that the age gradient matters for this particular group. The odds of experiencing poverty increase for this particular group when age is controlled for. In addition, the odds of poverty are now almost similar between the *de facto* female and *de jure* (divorced) female headships.

In sum, the results in Models 3–5 show that the inverse association between female headship and poverty persist, net of their socioeconomic characteristics and residential location. In other words, to this point, there is no evidence of female headships being worse off than their married male counterparts. The changes in the values of the coefficients suggest that the odds of poverty for the different groups of headships are to some degree explained by geographic location and the socioeconomic characteristics of the household head. The latter is mostly through their level of education.

Table 5.5 (Model 6–7) introduces measures on the employment ratio and the average years of schooling of other household members. The measures are proxies of the human capital status and potential income contribution from other adult household members. It is necessary to take into account the human capital of other householders because the definition of household headship is not just limited to 'primary economic provider', but also includes those identified on the basis of age. There is thus the possibility that, where the head is an older and economically inactive person, the household is being supported by another adult member.

Interestingly, the results in Model 6 show that the employment ratio of other adult household members is positively associated with household poverty. A closer look at the data shows that most employed family members (of whom the majority are women) are predominantly casual workers, followed by members engaged in unpaid family work and those who are self-employed. The question of whether poverty is a prerequisite for employment among spouse or other adult household members requires further research. The results here show a positive association, but the exact nature of the relationship is not clear. This also potentially suggest that having working adults in widowed households, may not mean that these households have lesser risk of poverty than other households. This subject will not be further explored in this chapter, but it surely merits further research.

The results in Model 6 also show that average years of schooling of other adult household members is positively associated with the economic well-being of household. Neither variable (employment ratio or average years of schooling) changes the group of female headship coefficients by much, but there is a notable improvement in the welfare of households headed by other single headships compared to male-headed couple households. This suggests a higher presence of household members with positive human capital within this group.

Table 5.5. Logistic regression analysis of households in poverty versus households not in poverty, results as odds ratio: effect of contribution from other householders and number of children added (N=2,260,881)

	Model 6		Model 7	
	Effect of human capital of other householders added		Effect of total children added	
Type of headship (ref: male head, married)				
Female head, <i>de facto</i>	0.70***	(0.019)	0.80***	(0.021)
Female head, divorced (<i>de jure</i>)	0.69***	(0.016)	1.04*	(0.022)
Female head, widowed (<i>de jure</i>)	0.62***	(0.008)	0.84***	(0.010)
Other, single headship	0.34***	(0.006)	0.58***	(0.009)
Employment status of head (ref: formal worker)				
Informal worker	1.19***	(0.009)	1.24***	(0.009)
Unemployed	1.78***	(0.048)	1.83***	(0.051)
Economically inactive	1.19***	(0.013)	1.26***	(0.014)
Education of head (ref: higher secondary or more)				
No formal qualification	3.35***	(0.036)	4.35***	(0.048)
Primary qualification	3.01***	(0.031)	3.43***	(0.036)
Lower secondary qualification	2.05***	(0.024)	2.20***	(0.027)
Type of education of head (ref: national qualification)				
Islamic qualification	1.17***	(0.019)	1.12***	(0.019)
Age group of head (ref: 30–49 years)				
15–29 years	0.73***	(0.007)	1.14***	(0.012)
50–69 years	0.80***	(0.005)	1.13***	(0.008)
70 years and more	0.65***	(0.009)	1.24***	(0.016)
Employment ratio of other householders	1.10***	(0.007)	1.08***	(0.007)
Average years of schooling of other householders	0.46***	(0.002)	0.61***	(0.003)
Number of children			1.64***	(0.004)
Constant	0.32***	(0.006)	0.06***	(0.001)
Log pseudo-likelihood	-188,600,000		-179,800,000	
Pseudo R-Squared	0.12		0.16	

Note 1: *** indicate statistical significance at the 0.1% level.

Note 2: Coefficients on province dummies are not reported.

Note 3: Children are defined as aged 0–18. Definition excludes those in full-time employment.

The two variables – employment ratio and average years of schooling of other adult household members were maintained in subsequent models because the human capital contribution of other members reduced the strength of the association observed between a household head's education and poverty. This suggests that, while the lack of education among headships increases the risk of household poverty, the strength of the association reduces when the economic contribution of other household members is taken into account.

The next model introduces the number of children aged 18 and under who are present in the household (excluding children aged 10–18 whose primary activity is employment, as they are captured in the employment ratio). Holding all other factors constant, the odds of household poverty increase by 1.64 with every additional child. In other words, the expected net odds of poverty among households with two children are about 64 percent greater than in households with one child. More importantly, the inclusion of this explanatory variable increases the coefficient of the female headship and other single headship groups, narrowing the gap between this group and male-headed couple households. This suggests that a significant share of the economic disadvantage observed in male-headed couple households is explained by the number of children within those households.

At this point, households headed by female divorcees with *de jure* status are associated with slightly higher odds of poverty than male-headed couple households, though the coefficient is borderline significant. The results suggest that the number of children is an important factor in explaining the differences in poverty between households headed by female groups and the majority. Another way of looking at this trend is that the presence of children is higher in couple than single headship households. By controlling for the effect of children, male-headed households appear less poor.

In addition, a substantial change is also observed among the different age groups, with positive associations at both extremes. In other words, households headed by younger and older individuals show higher odds of poverty compared to mid-age adults. This suggests that much of the poverty effect observed earlier (Model 5) among the middle age adult group comes from the fact that they are more likely to have a higher number of young children in their households.

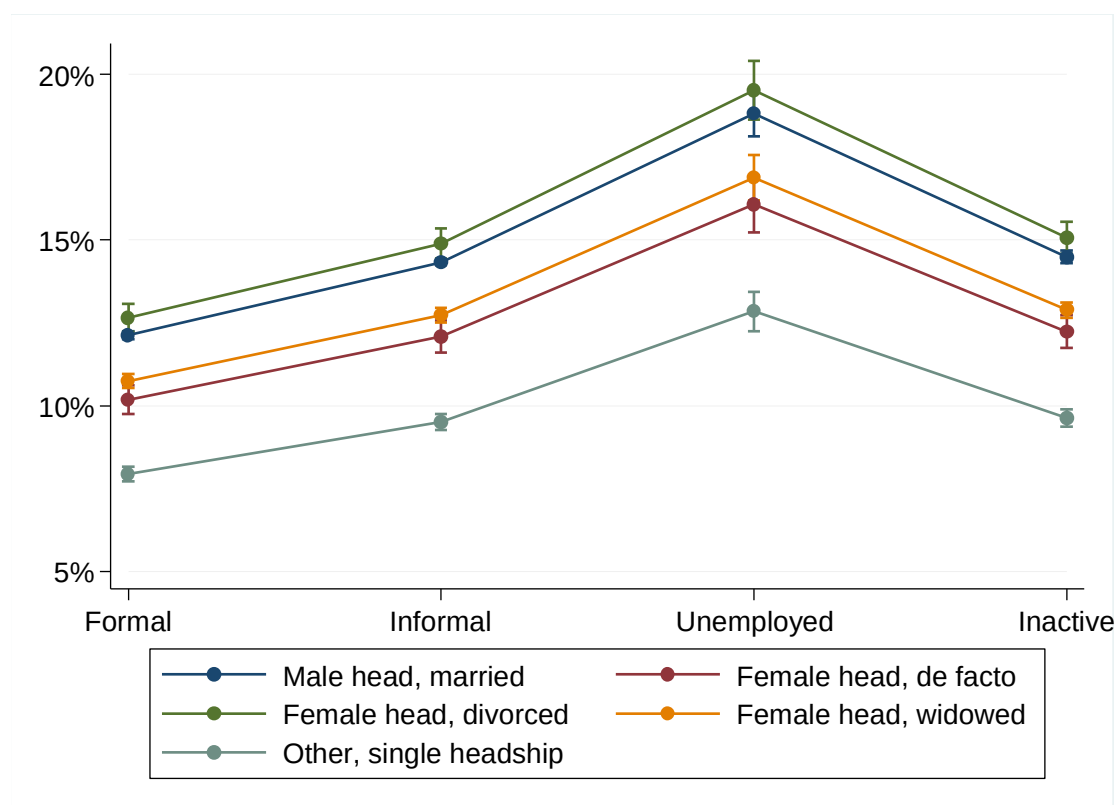
Given the clustered nature of the SUSENAS data (households nested within provinces), an additional check was performed using a multilevel model that controlled for clustering in provinces. The STATA command (xtlogit) does not allow for probability weights. Model 7 was hence re-estimated without weights (Table E.5, Model 7b, Appendix) to ensure comparability with the multilevel analyses. The multilevel results (Table E.5, Model 7c, Appendix) mirrored the logistic regression results. This suggests that there is very minimal variation within the cluster (within provinces). The application of the logistic regression model is hence considered appropriate in the context of this chapter.

5.4.2.1 The association between employment status and the number of children

It is surprising to note that employment status explains very few differences in poverty between the headship groups. However, the question of to what extent the poverty status of a household varies by the association between the household head's employment status and the number of children was further examined. At this point, it is helpful to think in terms of predicted probability of poverty. Predicted values of poverty are computed from Model 7 for the combination between each headship group and employment status. Adjusted predictions are produced using the *margins* command in STATA, as the command takes into account the interdependencies between variables (Williams, 2012; Long and Freese, 2006). The trend of predicted probabilities is illustrated in Figure 5.7. Four points can be summarised from the figure.

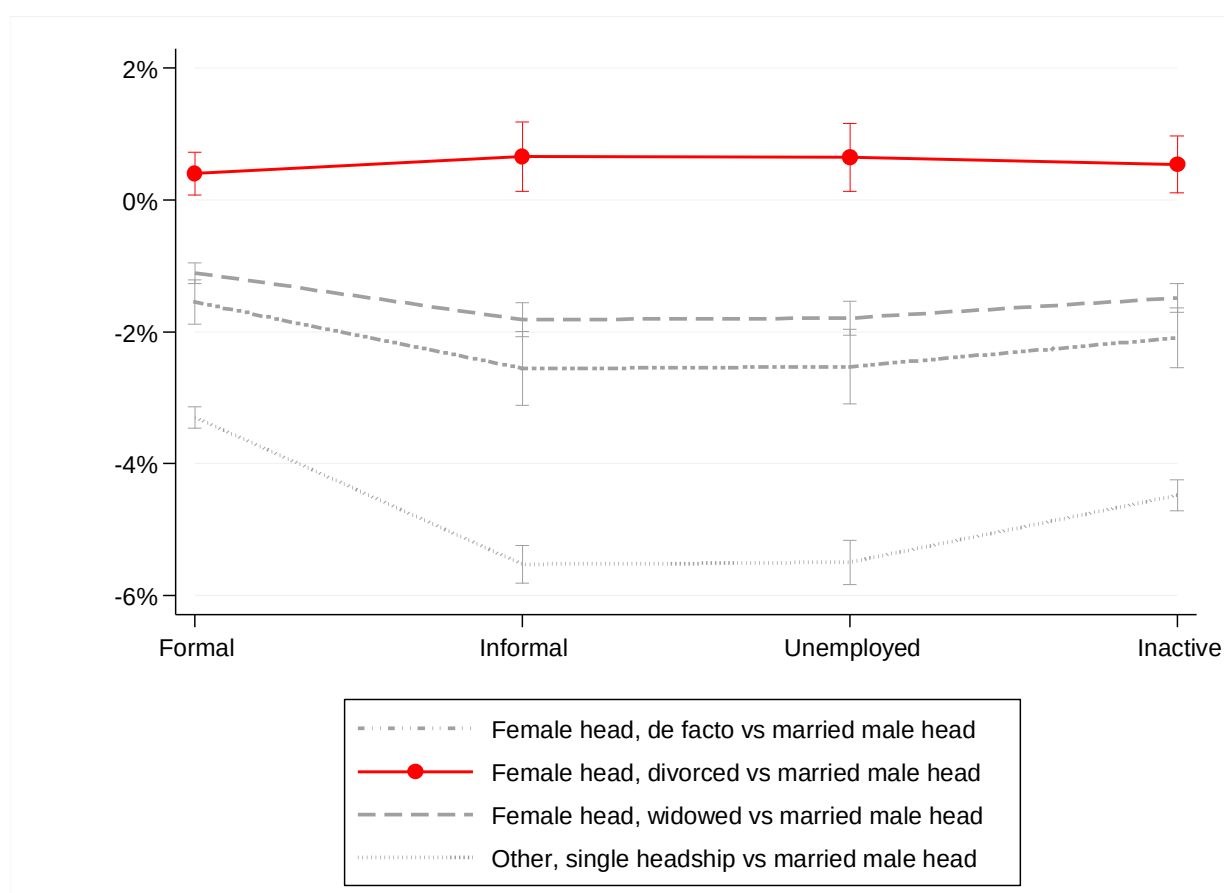
First, at any given level of employment, the probability of being in poverty is higher for households headed by female divorcees than for any other household. Second, households headed by women with *de jure* status show a higher probability of poverty than households headed by women with *de facto* status. Third, unemployment is associated with higher probability of poverty across the different groups of headships. Chapter 4 demonstrated the significantly higher risk of poverty among unemployed individuals at all levels of education. The results in this section add to the overall findings, in that households led by unemployed female divorcees are economically more vulnerable than any other household. Fourth, the differences between the two groups of headship – married male versus female divorcees – are quite narrow. Are the differences significant? Is there evidence that households headed by female divorcees are in fact poorer than all other households?

Figure 5.7. Predicted probabilities of household poverty by headship and employment status, Indonesia, 2000–2009



The average marginal effects, that is the difference in the adjusted predictions for the groups, were computed holding all independent variables at their observed value (Figure 5.8). The results show that poverty between households headed by female divorcees and married men do differ by employment status (red line, Figure 5.8). The average probability of poverty among households headed by female divorcees in informal work is 0.66 percent higher, unemployment is 0.65 percent higher, inactivity is 0.5 percent higher and formal work is 0.4 percent higher than for married men in a similar position. The difference is significant at $p=0.01$. However, the findings here highlight that there is some evidence that households headed by female divorcees are poorer than the majority male-headed couple household, but the differences are fairly marginal. This corresponds with the findings from the Latin American region (Chant, 2006).

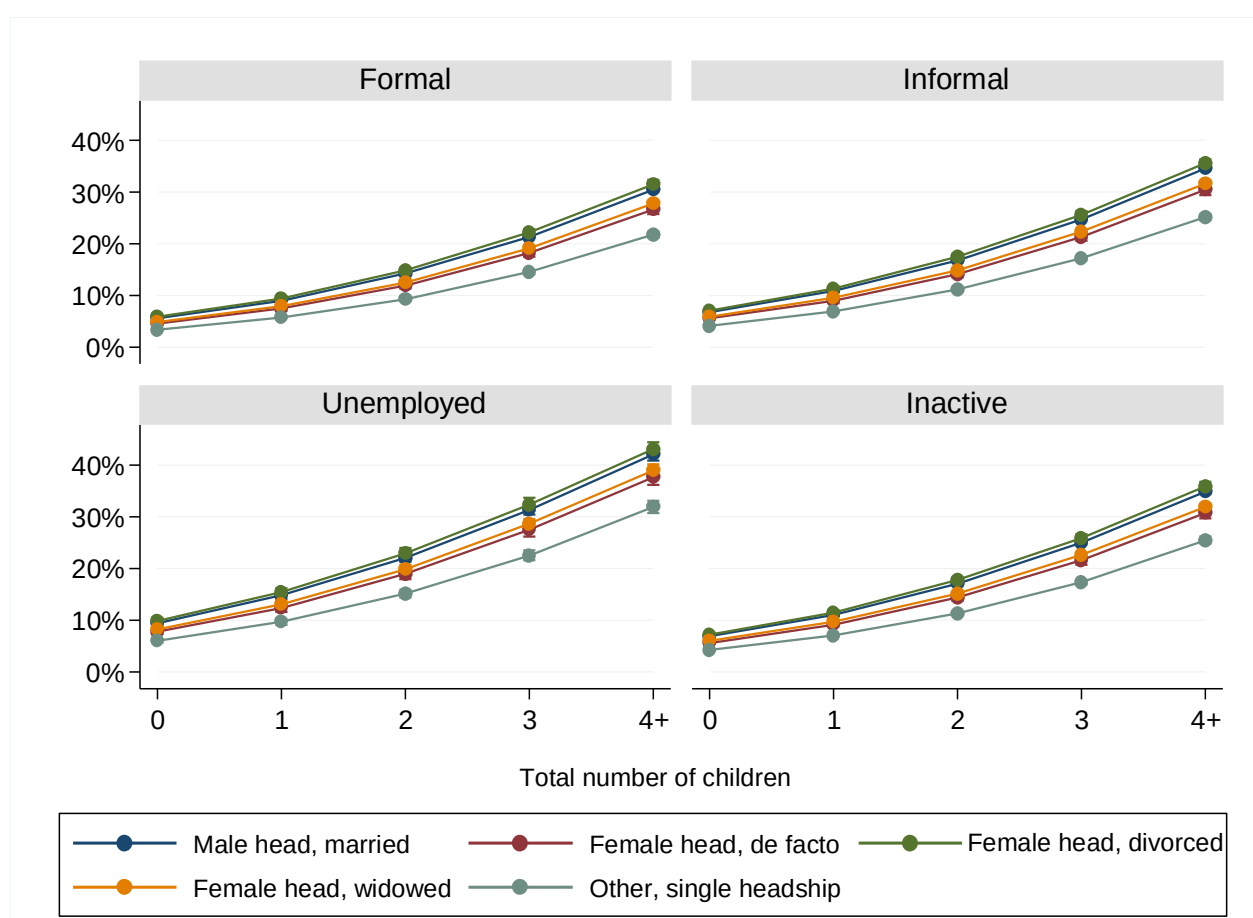
Figure 5.8. Average marginal effects on household poverty: differences in the adjusted predictions of single headship groups and married male headships by employment status, Indonesia, 2000–2009



The average marginal effects were recomputed holding the widowed female headship group as the reference (not shown here). The results suggest that households headed by women with *de jure* status have a significantly higher average probability of poverty than households headed by women with *de facto* status, at all levels of employment. This confirms that, in the context of Indonesia, female *de jure* households are economically more vulnerable than households headed by women with *de facto* status.

Predicted values of poverty are computed also from Model 7 for the combination between each headship group and employment status and how these vary by number of children. The results are illustrated in Figure 5.9. The probability of poverty does increase for all headship groups as the number of children goes up. The trend is evident for households with more than two children: the probability of poverty increases slightly more rapidly for households managed by female divorcees than for male-headed couple households. The association is also greater for unemployed households with more than two children than other households.

Figure 5.9. Predicted probabilities of household poverty by headship, employment status and number of children



5.4.2.2 Regional analyses

The question of to what extent the association between poverty and type of headship varies by region is further examined. This brings us to the second hypothesis of this chapter.

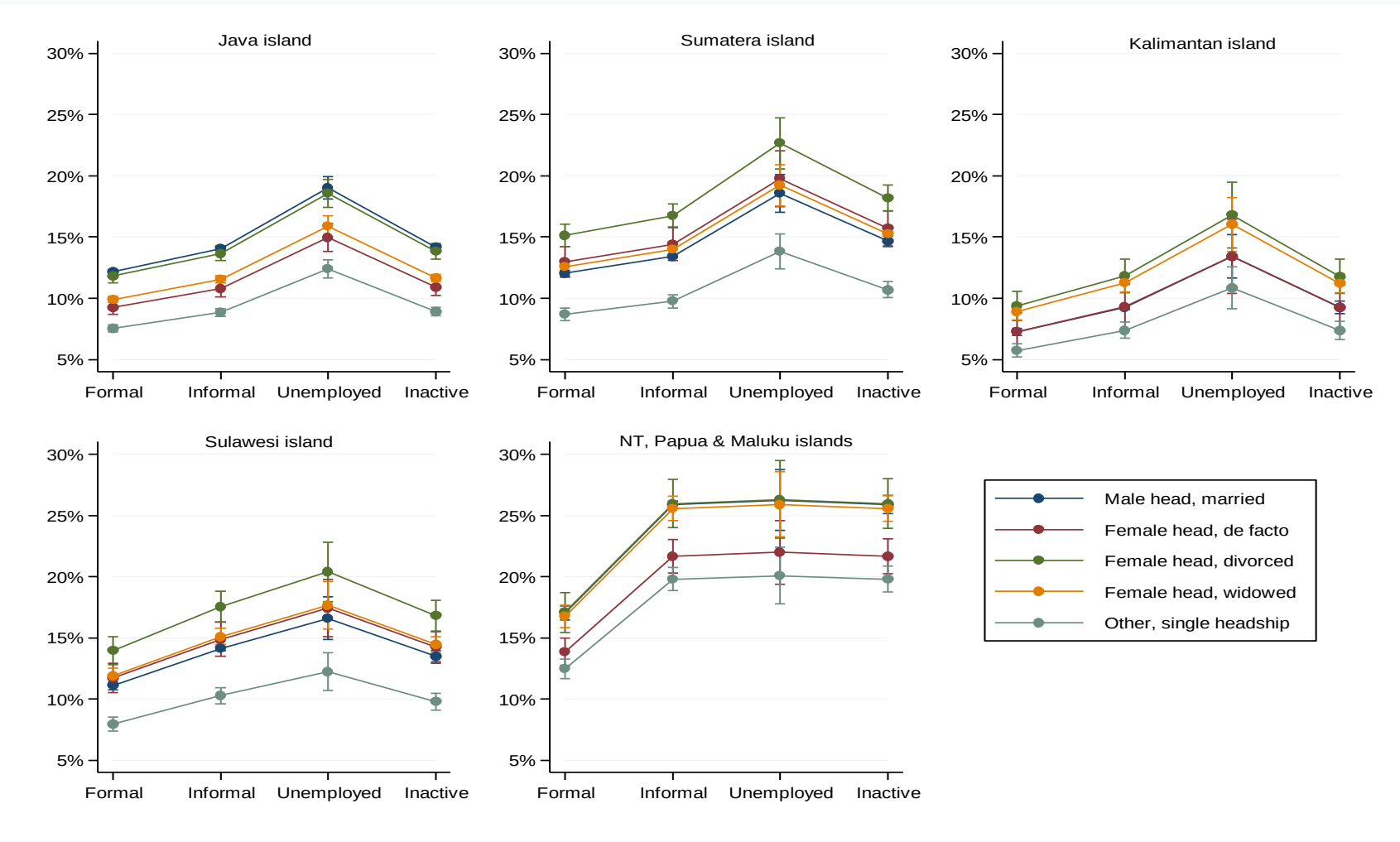
Hypothesis 2: Households headed by female divorcees have a higher risk of poverty in less developed areas of the country than their counterparts living in more developed regions of the country.

A series of logistic regression models were generated by five of the major island provinces of Indonesia (Table E.6, Model 8a-e, Appendix). The islands of Nusa Tenggara, Maluku, Papua and Sulawesi form the eastern belt of the country. The eastern region is known for its high levels of economic deprivation compared to the islands of Java, Kalimantan and Sumatera. The predicted probabilities of poverty by household headship and employment status are computed for each of the major island provinces.

The results illustrated in Figure 5.10 show that the probability of poverty is higher in households headed by female divorcees in less developed regions than their counterparts living in better off regions of similar characteristics. For example, the probability of poverty among households headed by unemployed female divorcees in the group islands of Nusa Tenggara, Maluku and Papua is 26 percent, while it is 19 percent for those living in the island of Java. The results provide confirmation to Hypothesis 2. Five other details may be summarised from Figure 5.10.

First, the trend of households headed by female divorcees having a higher probability of poverty compared to all other households is most notable in the islands of Sulawesi and Sumatera. The only exception is in Java, where this sort of household is slightly less likely to be in poverty than the male majority group. Second, in the islands of Nusa Tenggara, Maluku and Papua, the probability of poverty is notably higher for households headed by female divorcees, married men and widows compared to households with similar characteristics living in other regions of the archipelago. In fact, in the least developed eastern regions, the probability of poverty is highly comparable among female divorcees and the male majority group.

Figure 5.10. Predicted probabilities of household poverty by headship and employment status across major regional islands, Indonesia, 2000–2009



Third, households headed by women with *de jure* status (divorcees and widows) are more likely to be in poverty than households headed by women with *de facto* status. The only exception to this trend is observed in the island of Sumatera, where the probability of poverty is slightly higher in female *de facto* households than those headed by widows. Fourth, unemployment is positively associated with increased probability of poverty for all headship groups. However, the islands of Nusa Tenggara, Maluku and Papua show something more. Here, the risk of poverty is comparable among households whose head is engaged either as an informal worker, is unemployed or is economically inactive. Fifth, the probability of poverty among the male majority group is more pronounced in regions with two extreme levels of development: in Java, the most populated and developed region of the country; and in Nusa Tenggara, Maluku and Papua, the most deprived eastern region of the archipelago. Elsewhere, they are better off than *de jure* single headship households.

5.5 Discussion

There are three major findings of this chapter.

First, there is an important heterogeneity in the situation of female-headed households in Indonesia. This arises from the distinction between *de facto*, *de jure* divorcee and *de jure* widow female-headed households, and confirms the importance of drawing out the different types of female headships, as has been advocated in other empirical work (Chant, 1997; Buvinić and Gupta, 1997; Youssef and Hetler, 1983).

Second, in the context of Indonesia, there is some evidence that *de jure* divorcee female-headed households are marginally poorer than male-headed couple households. Regional level analyses confirm that the differences are more pronounced between both groups in places like Sumatera and Sulawesi, where female divorcee group are economically far more vulnerable than the male majority group. It is only in the most developed region (Java) there is some evidence that male-headed households are worse-off than other households. In the poorest region, the probability of poverty is high for all groups of headship compared to their counterparts in other regions, but the probability is more pronounced (and almost comparable) for three groups: female divorcees, married men and widow households.

Third, *de jure* female-headed households are significantly worse off than *de facto* female-headed households. The only exception is observed in the island of Sumatera, where *de facto* female-headed households are marginally more likely to have a poorer outcome than households led by widows. The findings also point towards the importance of carrying out regional-level analyses given the different levels of development across the Indonesian archipelago.

It is useful to briefly summarise the descriptive and multivariate results to understand the three major findings stated above.

The findings of this chapter started with some descriptive numbers. A simple cross-tabulation revealed that female-headed households are less likely to be in poverty than male-headed couple households, and the former showed a lower poverty than the national average. However, the disaggregated headship group revealed that: (1) all female headship groups showed higher levels of poverty than the national average; (2) *de facto* female group showed comparable levels of poverty to those of the majority; and (3) *de jure* female group showed slightly lower levels of poverty than the *de facto* female group. The lower levels of poverty among the *de jure* female group are interesting, despite the fact that they are significantly deprived in the domains of education and employment when compared to married men. The comparable levels of poverty between the *de facto* female and married male group is also interesting, despite the fact that the former is more likely to receive remittances (an assumption that I am drawing based on their lower levels of employment engagement). So why do we not see higher levels of poverty in the *de jure* group, which also accounts for higher levels of human capital deprivation?

One potential explanation is the higher presence of young children in couple and *de facto* female households compared to the *de jure* female group. This was confirmed in a multivariate framework. The inclusion of number of children in the model increased the coefficients of the female headship groups, notably among divorced households, to the point that the group showed higher odds of poverty than the male majority, though the relationship is only borderline significant. Adjusted predictions of poverty by employment statuses of the household head and number of children show that divorced female-headed households are marginally worse off than couple households, while all other female-headed households are no worse than male-headed households. But regional level analyses reveal an important

variation in the general findings. In the eastern and western region of the country, the vulnerability of single headship households is significantly higher than, or comparable to, that of the male majority.

A limitation of this study is the use of self-reported definitions of household headship. Buvinić and Gupta (1997) argue that there is some degree of ambiguity in the term ‘head of household’ when the assignment of headship is left to the judgement of the household members. Accordingly we observe this trend in the SUSENAS. Household members have used different criteria to make the assignment of ‘household headship’, potentially causing a problem of comparison. But additional effort in identifying the within household dynamics (such as the human capital of other household members) have been undertaken in this chapter.

This chapter also recognises that there is strong cultural preference to designate men as the household head. The definition more than often fails to identify specific cases within couple households, where women are the primary provider while their menfolk either do not work or only contribute marginally to household maintenance. In reality these households must be identified as ‘female-headed couple households’. There is thus some risk that the male-headed couple household category is inflated in this study.

Furthermore, there is also a risk that the category of *de facto* female headship has been under-reported. Hugo (2002) argues that in the case of Indonesia, undocumented international labour emigration is certainly greater in scale than documented movement. Hence, it will not be surprising if, during surveys, householders chose to list the presence of male heads, even if in reality that head may have emigrated illegally for employment to a neighbouring country. Once again, the share of households headed by married men may have been over-reported.

5.6 Conclusion

This chapter concludes that women-headed households are highly heterogeneous. Disaggregating them into sound analytical categories matters for our understanding of poverty in Indonesia. Only by disaggregating them are we able to see the type of households that are likely to be most *in need*. In the context of Indonesia, poverty is most of concern among households led by female divorcees, followed by those led by widows. As a result, the

common argument that female-headed households in Indonesia are economically better off than male-headed households (following the studies by Quisumbing et al., 2001; Perdana and Maxwell, 2004; and Manning and Sumarto, 2011) lacks relevance when the different types of female headship are taken into account.

One may argue that the disaggregated categories of female headship make up a very small proportion of the Indonesian population, and that targetting them through policy reduction programs would have a limited impact on Indonesia's poverty numbers. Here, however, it is not the numbers that should matter alone: the multiple disadvantages faced by female headships, particularly divorced mothers, must also be taken into account. They are not only burdened by poverty, but they also face gender discrimination (limited employment choices and poor pay) and the dual burden of work and domestic duties. We have shown the precarious economic position of unemployed female heads. District-level policy interventions that promote skill-based training (such as computer-typing for single mothers) will go a long way in allowing them to secure decent paid jobs.

Of course, in no way must we discount the risk of poverty among male-headed Indonesian households. The risk of poverty is more pronounced for couple households in the most developed regions and in the least developed regions of the archipelago. The fact that there is a regional effect on how household headships respond to poverty also means that where one lives matters for one's poverty outcome.

Chapter 6

Conclusion

6.1 Background

Indonesia enjoyed sustained rapid growth between 1984 and 1996, with *per capita* GDP growing at an annual rate of four to five percent. In the same period, the share of Indonesians living below the official poverty line fell from 30 to 11 percent. Yet, the geographic differences in poverty persisted. The two decades of economic prosperity was followed by the economic crisis of 1997-1998. The impact was almost immediate among the poor and those clustered just above the poverty line. Many of them, with minimum levels of education and low skill were out of wage-employment when manufacturing companies ceased operation. More Indonesians who now lost their jobs in the formal sector found alternatives in the informal urban sector and agricultural sector. In the decade following the economic downturn, economic growth improved and poverty rates returned to their pre-crisis levels, but growth in formal employment was slower.

This leaves us with questions: Does an increasing GDP continue to contribute to falling levels of poverty, when the share of informal workforce is taken into account? Does the combination of lack of formal education and informal employment mean increased risk of poverty for this group of individuals? To what extent poverty varies between the different groups of female and male headship when their employment and other demographic characteristics are taken into account?

These questions were the starting point of this thesis.

The rest of this chapter is organised as follows. The next section revisits the key research questions of this thesis. The following section summarises the main findings. The fourth section addresses the contribution of the findings to the field of poverty and development. The final two sections address the limitations of the research and suggestions for future research.

6.2 Research aims reviewed

The objective of this thesis is twofold: (1) to compare the geographic trend of poverty in Indonesia based on the official government measure, the World Bank's international \$1.25 a day measure and a relative measure; and (2) to examine the structural factors that explain the geographic variation of poverty in Indonesia. The overarching research question of this thesis is to what extent do provincial, household and individual level determinants operate along with employment structure in explaining poverty outcome in Indonesia? Specifically, the factors explored in this thesis are: GDP per person (representing province-level), level of education (representing individual-level), type of household headship (representing household-level) and employment statuses (aggregated either at the province, individual or household level).

The word 'determinants' seems to suggest causal implications. But in the context of this thesis, 'determinants' refer to associations of the different factors, operating at different levels of the society with regional poverty. Explaining poverty across the Indonesian archipelago is a subject that has received very little scholarly attention. As such, it is pertinent that one must first explore the potential factors and their associations with regional poverty trends. In other words, it is useful to make accurate estimates of the associations before advancing to any causal interpretation.

However, before investigating the explanations of poverty at these three different levels, it was important to understand sub-national poverty trends in Indonesia. This thesis gives precedence to the official or government poverty measure of Indonesia, otherwise also known as the BPS poverty. However, it is important to establish the robustness of the subnational poverty trends using multiple measures of poverty. In particular, a comparison between the BPS measure and the World Bank's international \$1.25 a day measure is useful to understand the extent to which BPS measure is defensible if poverty in Indonesia is measured by the standards of the poorest countries in the world. A poverty comparison between the BPS measure and a relative measure in the context of Indonesia is useful since both measures originate from contrasting yet dominant concepts of poverty. In sum, the comparison of Indonesia's subnational poverty trend across multiple measures of poverty allowed us to establish the reliability of the BPS measure.

Four specific research questions were framed around the overarching research question.

These are:

- i. Are regional trends of poverty sensitive to the different measures of poverty?
- ii. How does regional poverty respond to GDP per person when the share of informal workforce is taken into account?
- iii. Is the risk of poverty more acute for informal workers lacking education than all other groups? Are they worst-off in less developed than in developed regions of the country?
- iv. Are households headed by women with *de jure* status, particularly those who are divorced, poorer than all other types of households? Are they worst-off in less developed than in developed regions of the country?

The existing literature has paid very little attention to these set of questions. In particular, all previous studies on the subject of regional poverty trends are limited to poverty measured using the BPS methodology. More importantly, there are even fewer studies that explain geographic differences in poverty in Indonesia. The existing few studies have primarily focused at the macro level, particularly on the subject of to what extent changes in aggregate level economy contributes to poverty reduction. The exploration of micro (individual) and meso (household) factors have so far remained elusive in explaining the persisting geographic differences in levels of poverty in Indonesia. For example, there is no published work that has systematically analysed the economic well-being of the different types of household headship in Indonesia.

This thesis has moved beyond the constraints of a single measure of poverty and macro-level explanations to investigate regional poverty trends using multiple measures of poverty and to explore household and individual level explanations (in addition to macro-level factors).

6.3 Key findings

6.3.1 Measures of poverty

Chapter 2 compared the findings of geographical poverty differences in Indonesia based on the BPS measure with the World Bank's international \$1.25 a day measure and the relative poverty measure. The findings of this chapter may be summarised in four main respects.

First, different measures of poverty produce different numbers of poor. Some 33 million additional Indonesians were identified as poor using the \$1.25 a day poverty measure than the official BPS measure. The \$1.25/day line represents an average increase of \$0.17 cents from the BPS line. In other words, the average of the national poverty lines of the poorest 15 countries in the world is \$0.17 cents higher than the average BPS provincial poverty lines. Evidently, when a slightly higher poverty line is applied, significantly more Indonesians are identified as poor.

The differences between both measures of poverty are, however, driven by poverty trends in the early 2000s, a time period in which the country was recovering from the devastating impact of the 1997–98 financial and political crisis. The finding reveals that millions of supposedly non-poor Indonesians identified using the BPS measure were in fact clustered very closely to the BPS line during this vulnerable period. In the latter part of the 2000s, poverty trends were converging between the two measures, suggesting some degree of reliability of Indonesia's official poverty measure. On the other hand, a shift from a BPS measure to a relative measure reveals that provinces with low relative poverty are the same provinces that account for high BPS poverty. This means that in these provinces, the relative poverty line is lower than the basic needs poverty line. A relative line that is below a frugal basic needs line does not help the poorest of the poor nor does it make sense.

Second, the ranking of the poorest to the least poor provinces remains quite robust across the poverty measures that are anchored to the basic needs approach (BPS measure and \$1.25 a day measure), while the ranking shifts substantially when the poverty measure is based altogether on a very different concept, such as the relative approach.

Third, the *per capita* approach is the most applicable among the existing equivalence scales to convert household welfare into individual level measure. Measures that are adjusted for the differences in needs by age and/or gender and/or economies of scale in consumption show unrealistically low levels of poverty. For example, between 2000 and 2009, poverty in Indonesia, following the BPS measure, is on average 17 percent. By applying the calorie intake scale that adjusted for the differences in needs by age, gender and economies of scale in consumption, the adjusted-BPS measure indicate that poverty on average is 5 percent. This thesis argues that the outcome based on the application of the equivalence scales is unrealistic given that Indonesians have collectively voiced out that the 17 percent poverty is a gross underestimation by the BPS. The voices of the people state that the frugal BPS poverty lines has failed to capture many more Indonesians who are experiencing daily hardships in meeting their most minimal needs (Action in Solidarity with Asia and Pacific, 15 August 2008).

The use of the *per capita* approach in the space of monetary welfare tends to conclude that larger households are poorer (because household expenditure that is divided by household size will invariably lead to lower per person expenditure in larger households). The lower per person consumption welfare in larger households may be an artefact of the *per capita* scale or a genuine reflection of the society. One way to draw support that the use of the *per capita* approach is not an issue and is a reliable scale is to test the association between household size and non-income based welfare measures. For example, by focusing on a non-income indicator, the question of equivalence scale is eliminated for the time-being. Specifically, the research question explored as an additional interest is: are children from larger families associated with lower educational attainment than children from smaller families? The results show that the probability of young Indonesians pursuing higher education is significantly lower if they come from larger than smaller families. The positive association between family size and educational deprivation among children can be seen as lending support to the argument that there may be some genuine reflection that family size and poverty is positively associated. This in turn points towards the validity of using household size to convert household level welfare to per person welfare.

Fourth, the decline in probabilities of poverty is also much slower in most provinces in the eastern region in comparison with other regions. As a result, the probabilities of poverty remain persistently high over time among most provinces in the eastern region.

This chapter concluded that regional trends of poverty are sensitive to the different measures of poverty. The comparison should, however, be based on measures of poverty that are anchored to concepts of poverty that are relevant to the Indonesian society. In this case, poverty measures that are anchored to the basic needs approach is of most relevant.

6.3.2 Macro level explanations

Chapter 3 investigated the association between GDP per person and poverty while holding the share of informal workforce constant. The hypothesis assumes that the macro-level economy affects employment creation (whether informal or formal in nature), which in turn affects poverty. Following this assumption, GDP data of previous year was applied on the current year employment and poverty data. Fixed effects analyses were carried out using a panel set of provinces from 2000 to 2009. The application of the fixed effects model addressed the issue of omitted variable bias.

The findings of this chapter may be summarised in four main respects.

First, the association between GDP and poverty is reduced marginally when the share of the informal workforce is taken into account, but in general the negative association remained robust. In other words, the general trend is that an increasing GDP is associated with lifting people out of poverty in an environment where the share of informal employment is prevalent.

Second, an increasing GDP is associated with lifting people out of poverty but it is doing far less for the poorest of the poor. This is revealed by comparing the association between GDP and two different measures of poverty – the BPS measure and the \$1.25 a day measure. Results show that the negative association between GDP and BPS poverty is small, while the size of the association is larger by the \$1.25 a day measure. The explanation for this trend is as follows. BPS lines are lower than the \$1.25 a day line. This suggests that the BPS measure is more likely to capture those living at the bottom most of the welfare continuum. The findings of a much smaller negative association between GDP and BPS poverty suggest that those at the very bottom of the welfare continuum have benefitted less from a growing economy.

Third, regional analyses reveal some differences to the general trend. In the easternmost region, GDP has a very small, insignificant negative association with poverty. This suggests that increasing GDP is associated weakly with the poor in the poorest region of the country, where the share of the informal workforce is much more prevalent. Furthermore, it is in this part of the country, where the positive association between informal workforce and poverty is significantly stronger than in other regions. In areas such as Papua and West Papua, the GDP is driven by the mining sector. Global estimates indicate that the highest amount of gold and third highest amount of copper are extracted in both these provinces. Yet, the region's mineral-driven-GDP-output has a smaller impact on local employment and income spin-offs. A significant majority of those living in the eastern region of the archipelago are confined to low-productivity agricultural jobs. The eastern region of the Indonesian archipelago is a classic example of where the macro-level economy matter less for poverty when the prevalent form of employment among the locals is of an informal and low productivity nature.

Fourth, the negative association between GDP and poverty are significantly stronger in the later part of the 2000s. In the periods before that, the relationship is either marginal or absent. The period analyses show that GDP mattered less for poverty during macro-level crises that impacted the poor directly, such as of rice and fuel price rises observed between 2005-2006.

This chapter concluded that, in the context of Indonesia, increasing GDP per person is associated with falling levels of poverty despite the fact that a significant share of the working population is engaged as informal workers. Increasing GDP is, however, associated weakly with lifting the poorest of the poor out of poverty. It seems, those living in the poorest regions of the country have not benefitted from an increasing GDP.

6.3.3 Individual level explanations

Chapter 4 explored the importance of an individual's educational attainment on poverty in association with their employment status. More specifically, the chapter explored whether the positive association of no formal qualification and poverty is stronger among informal workers. The results showed that the strong negative association between education and poverty remained stable even after employment status was taken into account. This means a

person who lacks formal education pay a heavier poverty ‘penalty’ than those with some formal education, even if both individuals are engaged in favorable work.

An interaction between level of education and employment status revealed the precarious economic position among the unemployed who lack a formal education. This finding is highlighted because unemployment is often seen as having little relevance to poverty, since a higher proportion of the unemployed are tertiary educated.

The results also revealed that at higher levels of education, the association between employment status and poverty matters more. High-school educated informal workers are better-off than informal workers lacking formal education, but the former do less-better than their counterparts with formal employment. This suggests that lack of formal sector jobs for educated Indonesians does little for poverty reduction. It is interesting that the employment effects are weaker at the lower-end of the educational spectrum, particularly among working-age women. This may be that income levels are similarly low for the poorly educated, independent of their employment status. Uneducated formal workers are more likely engaged as lowly paid factory workers, security guards or office secretaries/attendants – the type of jobs that characterise the lower tiers of public services or government sector. So they are likely to have comparable levels of income as the uneducated informal workers.

A special mention in this chapter is the economically inactive population. Some one third of the working-age Indonesians are inactive. Furthermore, the risk of poverty is almost comparably high among the inactive population and the unemployed when both groups are lacking formal education. However, educated women who are inactive have lower risk of poverty compared to men of similar status, suggesting that women may opt to be inactive under conditions when their household is not at risk of poverty (e.g.: spouse have secured jobs).

Regional level analyses showed that the ‘penalty’ on poverty for those occupying the lower tiers of educational qualification is heavier in the less developed easternmost regions of the country. In other words, despite being equipped with higher educational qualification, a person is not spared from economic disadvantages if they are living in economically less developed regions.

6.3.4 Household level explanations

Chapter 5 explored to what extent the distinctive types of female headships and their demographic characteristics explain poverty at the household level. In the context of Indonesia, the topic of female headship and their economic well-being, to date, has received very little attention.

Descriptive results showed that the different groups of female headship – *de facto*, divorcee and widows – was less likely to be poor than male-headed couple households. This despite that divorced and widowed female heads are significantly deprived in the domains of education and employment when compared to married male heads. In a regression analyses, the different groups of female headship continue to show that they were better-off or no-worse than male-headed couple households. The inclusion of number of children as a control, however, increased the coefficients of the female headship groups, notably among divorced households, to the point that divorced female-headed households are marginally worse off than male-headed couple households. This suggests that poverty in male-headed couple households is mostly explained by number of young children in those households. Once this factor is taken into account, the economic vulnerability of female-headship households are revealed, particularly female-led divorcee households. This study has demonstrated that women-headed households in Indonesia are highly heterogeneous. This confirms the importance of drawing out the different types of female headships in analytical work related to household headships.

An interaction analyses between household headship, employment statuses and number of children show that the risk of poverty peaks among unemployed female-head divorcees with four or more children. The risk of poverty is also comparably high for male-headed couple households who have similar demographic characteristics.

Regional level analyses reveal that female divorcee-led households have significantly higher probability of poverty than male-headed couple households in all regions, except in the richest and poorest regions, where both groups show comparable risk of poverty. In other words, in less-developed regions, female divorcee-led households and male-headed couple households are somewhat equally more likely to experience poverty.

6.4 Research contributions

6.4.1 Unemployment and poverty

This is the first study to highlight the precarious position of unemployed Indonesians. The findings are consistent at the individual and household-level, across regions and across time. In Indonesia, unemployment is often seen as having little relevance to poverty, since a higher proportion of the unemployed are tertiary educated. This thesis has shown otherwise. The tiny minority of unemployed individuals occupying the lower tiers of education are highly vulnerable towards poverty. The finding is consistent across time, by gender and the gradient between unemployment and poverty is found to be stronger in the less-developed eastern regions than other regions in Indonesia. In addition, the effects are worse for individuals living in unemployed female-led divorcee households.

6.4.2 Vulnerability of female-led divorcee households

Disaggregating female-headed households into sound analytical categories matters for our understanding of poverty in Indonesia. Only by disaggregating them are we able to see the type of households that are likely to be most *in need*. In the context of Indonesia, general findings indicate that households led by female divorcees are marginally worst-off than male-headed couple households. The findings in this thesis contradicts the common notion that female-headed households in Indonesia are economically better off than male-headed households.

One may argue that the disaggregated categories of female headship make up a very small proportion of the Indonesian population, and that targetting them through policy reduction programs would have a limited impact on Indonesia's poverty numbers. Here, however, it is not the numbers that should matter alone: the multiple disadvantages faced by female headships, particularly divorced mothers, must also be taken into account. They are not only burdened by poverty, but they also face gender discrimination (limited employment choices and poor pay) and the dual burden of work and domestic duties. This thesis has shown the precarious economic position of unemployed female heads. District-level policy interventions that promote skill-based training (such as computer-typing for single mothers) will go a long way in allowing them to secure decent paid jobs.

6.4.3 The poor in poorer regions are being left behind

Findings in this thesis indicate that those who lack formal education, are unemployed, and are living in households led by female divorcees have higher risk of poverty. Findings across the empirical chapters collectively indicate that their economic deprivation, however, is much more severe if they are living in economically deprived areas of the country. It is in the easternmost regions where the decline in poverty has been the slowest. Furthermore, a rising GDP has done very little for falling levels of poverty in this region. One may conclude that poor Indonesians living in the easternmost regions of the archipelago face a double ‘penalty’ on poverty. The combination of poorer individual-level outcome and living in geographically deprived region means that their risk of poverty is substantially higher, then someone with similar characteristics living in other parts of the country. In other words, Indonesians living in the eastern tip of the archipelago are being left behind.

6.5 Limitation of study

6.5.1 Potential underrepresentation of illegal settlements

The UN Human Settlements Program (UN-HABITAT) estimated that some 26 percent of Indonesia’s urban population lives in slums, with more than five million slum dwellers in Jakarta alone. Most often slums are associated as illegal settlements. Interestingly in Indonesia, slums are recognised as legal settlements by the local government. Almost eight out of 10 households in Indonesian slums have secure tenure either by owning or renting, while a minority are categorised as illegal squatters, that is, informal settlements (World Bank, 2016). Household with secure tenure means the resident’s right to occupy the land is recognised by the local government (World Bank, 2016). Illegal squatters on the other hand are informal settlements located on land that is not allocated for housing such as on riverbanks, under bridges, near railway tracks or privately-owned land (Baker, 2013; World Bank, 2016).

Baker (2013) argues that informal marginal settlements in Indonesia are likely to be undersampled by SUSENAS suggesting that information on poverty among this form of settlement is likely to be underrepresented. This is partly because communities living in informal settlements are much more mobile. It is not possible to determine by how much poverty is underreported following the limitations in capturing informal settlements. This thesis assumes that the numbers are low because informal settlements are comparatively

smaller in number when compared to slum households with secure tenure (World Bank, 2016; Burger et al., 2012).

6.5.2 Adjustments to household expenditure data

This particular limitation relates to a limitation in the SUSENAS Core survey. The household consumption expenditure data in the core survey is under-reported as it covers only some 15 aggregated food items and six aggregated non-food items. In contrast, consumption expenditure data from the module survey covers 215 specific food items and 90 specific non-food items. The World Bank (2014:18) observes that when the consumption expenditure questions are more detailed, respondents are likely to remember in more detail and to report higher spending. It is, therefore, misleading to estimate poverty using a 'low' consumption welfare data. This will inherently result in misleading poverty rates.

Hence, a practical approach was to adjust the mean household consumption expenditure data used in this thesis similar to the mean published from the Module by rural and urban areas of each province, as well as survey year. As a result, poverty estimates based on the adjusted consumption expenditure data were similar to the official figures published by BPS. The approach is straightforward, but there is a risk in adjusting data. The adjustment may push some households who genuinely had low expenditure into the higher quintile. However, the differences are more likely to average out, particularly when analyses are presented at the province level. More importantly, the implication of using an unadjusted data, that is, the original expenditure data of SUSENAS Core would have led to greater concerns such as misleading poverty numbers.

Despite its limitations, there are two reasons of why the data from the core survey was better suited for this thesis. First, data from the core component permits precise annual inferences to be made at the subnational levels, while data based on module is collected triennially. Second, the core survey covers a larger sample (some 200,000 household annually) than the module survey (some 68,000 households triennially). A large sample was very useful in cases where a small sub-population in any given society had to be identified such as individuals with Islamic schooling qualification in Chapter 4 and the different types of female-headed households in Chapter 5.

6.5.3 A focus on monetary-based poverty measures

The definition and measurement of poverty applied in this thesis is limited to consumption expenditure poverty that is constructed based on monetary definitions of welfare. In the last decade, the reliance on monetary indicators as sole measure of people's welfare has come under critique (Alkire and Santos, 2014; Stiglitz, Sen and Fitoussi, 2009). It is argued that realistically individual's poor welfare is not simply about low consumption, but there are other critical aspects of their lives such as poor nutrition, hunger, lack of assets, precarious housing, to name a few, that in combination affects an individuals' welfare. In other words, poverty is multidimensional: the approach puts people rather than material aspects at the centre of welfare definition. Since 2008, there is substantial work in the academia and increasing recognition in the political sphere that poverty is multidimensional. Goal one of the United Nation's Sustainable Development Goals – a set of goals to end poverty – emphasises ending poverty in all its form everywhere. The goal to end poverty in all its dimensions is an explicit recognition that poverty is multidimensional.

6.5.4 A focus on statistical associations

The findings of this thesis are limited to showing correlations between variables. The nature of the data applied in this thesis (repeated cross-sectional) means that variables are measured simultaneously, hence, no assumption of prior causal ordering can be justified. Hence the term 'determinant' used in this thesis refer to statistical associations rather than causal effects.

6.6 Future research

6.6.1 Monetary versus non-monetary poverty

This thesis has limited its focus to monetary based poverty measures and has not taken into account of poverty measured using a non-monetary approach. It was first important to establish the extent to which Indonesia's subnational poverty trend differed between the different measures of monetary poverty. In this thesis, we have established that there is some credibility to the BPS poverty measure when it is compared to the World Bank's international \$1.25 a day poverty measure. This is the first step. The future step must involve exploring the trends of subnational poverty in Indonesia between monetary and non-monetary measures of poverty. The latter may be constructed using a multidimensional framework such as the University of Oxford's Multidimensional Poverty Index (MPI) that is constructed using the Alkire-Foster (AF) approach.

6.6.2 Disadvantages of Islamic schooling qualification

On average, between 2000 and 2009, some 7 million of the 132 million working-age Indonesians had Islamic schooling qualification. In Chapter 4 of this thesis, the vulnerability of those who qualified from the Islamic education stream was highlighted. Descriptive numbers showed that individuals with Islamic primary qualification have comparable levels of poverty to those lacking formal education. At higher levels of qualification, those with Islamic education are predominantly out of active employment than those who graduated from the general education stream. It is less clear whether this is because of the nature of the schooling that does not cater to existing jobs in the labor market or whether there is general discrimination against those with an Islamic education background. This group merits a special focus. Aggregating them into the general education category – as done in the analyses section of Chapter 4 – means their deprivation remains hidden.

6.6.3 Vulnerability of the economically inactive population

On average, between 2000 and 2009, some 46 million of the 132 million working-age Indonesians stayed outside of the labor market. Of the 46 million, 28 million of them are women. In other words, for every 10 economically inactive individuals, six were identified as women.

In Indonesia, the national household surveys tend to identify *discouraged workers* as economically inactive. Discouraged workers are defined as jobless workers who want jobs but do not look for the jobs because they do not believe a job is available for them (Suryadarma et al., 2005). One may argue that the *discouraged workers* should be grouped under long term unemployment. As such, by classifying *discouraged workers* as inactive, BPS is essentially underreporting unemployment and inflating the economically inactive group.

In Chapter 4 and Chapter 5, relevant analyses were carried out to identify the demographics of the inactive group. We know they are predominantly women and are clustered in the lower tiers of education. We also know that inactivity is high among households that are headed by married women whose husband is away presumably for employment. However, the findings are very descriptive. A special focus on this group is of necessity. There is a need to understand why a significant share of the working-age population, particularly women, have

remained outside of Indonesia's labour market. We need to shed light on puzzles surrounding this group such as fertility choices made by women and the consequence this has on women's inactivity and poverty status. Finding local literatures on the economically inactive population and their well-being has proven to be a challenge. This subject is a fertile ground for future research.

6.7 Concluding thoughts

Where one lives in the Indonesian archipelago matters for their poverty outcome. The geographic diversity of this archipelagic nation is astounding: some 220 million people live in some 900 islands that are clustered into 33 provinces and five major regional islands.

Provinces in the eastern region of the archipelago have consistently shown higher levels of poverty compared to provinces in the western and central region. There are, of course, important exceptions to the general trend. Provinces in the western region such as Aceh and provinces in the central region such as Central Java also show persistently high levels of poverty. A consistently measured regional analyses is important to identify the problematic areas in the archipelago.

This thesis has documented that, on average, an increasing GDP is associated with falling levels of poverty. This means the living standards of Indonesians have improved despite prevailing levels of informal employment. Provinces such as Bali, where close to 60 percent of the workforce is engaged in informal employment, has over time reduced the share of its population living below the poverty line. However, the opposite is observed for the easternmost provinces. The eastern region have a substantial share of informal workers, as well as very high levels of poverty. This may relate to the type of informal jobs that dominate the local scene. In the eastern region, informal employment is very much confined to traditional agriculture. In places such as Bali as well as provinces on the island of Kalimantan, informal employment has diversified to include entrepreneurially-thriving small businesses and modern services. Generally, people living under difficult circumstances are entrepreneurial. But it only helps if there is reliable infrastructure such as road connections that allow locals to transport their locally made products to the nearest market.

In general, the lack of formal education is significantly associated with unfavourable employment and poverty outcome, and the gradient is stronger among individuals living in the remote eastern areas of the archipelago. While increasing levels of formal education is associated with lower risk of poverty, unfortunately that does not necessarily put a person living in the eastern areas in a level playing field as their counterparts in the most developed region. Indonesia's central and local governments must make the initiative to improve the quality of the schools in the eastern regions. By today's standards, the quality of these schools and the teaching resources are far below than what one may find in the islands of Java. Formal schooling must accommodate the values and identities of the indigenous communities in the islands of Papua, Maluku and Nusa Tenggara. Side-lining their culture only means that children are more likely to drop-out from school at an early stage.

Households headed by female divorcees are notably worse-off in regions with medium levels of development. Their risk of poverty is much higher and are comparably similar to that of male-headed couple households in the least developed regions of the archipelago. The findings show us that households headed by women who are divorced and widowed deserves policy attention. It is wrong to disregard these households as *non-problematic* when they are economically vulnerable.

In the context of Indonesia, centrally managed poverty reduction policies may not be the way forward. Provinces located in the eastern region have very focused social and economic issues. It may be more effective to address these issues, such as quality of employment, quality of schools, well-being of divorced mothers and widows, to name but a few, through locally initiated policies. More importantly, poverty reduction programs must incorporate the voices of the local communities in the eastern region.

Appendix A

Additional Tables for Chapter 1

Table A.1. Indonesian data invoice


BADAN PUSAT STATISTIK

INVOICE

Tanggal/Date : 12 September 2012
No : 603/INV/12

Dari/From : BPS - Statistics Indonesia Jalan Dr. Sutomo No. 6-8 Jakarta 10710, Indonesia	Kepada/To : Usha Kanagaratnam University of Oxford
--	---

Nomor (Number)	Deskripsi Data (Data Description)	Satuan (Unit)	Jumlah (Total)
1	Raw Data SUSENAS Kor 2000-2007; 2009 (selected variables)	463.589.376 byte dengan rincian sbb: 0 - 50.000 KB @ Rp 100,00 = Rp 5.000.000,00 50.000 KB - 100.000 KB @ Rp 50,00 = Rp 2.500.000,00 363.589.376 KB @ Rp 25,00 = Rp 9.089.734,40	16.589.734,40
	Jumlah (Total)		IDR 16.589.734,40 (INR 95961.42)

a/n Bendahara Penerimaan BPS

Ida Haslinda

Pembayaran ditransfer ke/Payable by telex transfer to:
 No. Rekening/Account : 0261.01.000638.30.2
 Atas Nama/Name : Bendahara Penerimaan BPS
 Bank : BRI
 Cabang/Branch : Krekot, Jakarta
 Alamat/Address : Jl. Samanhudi No.44 Jakarta Pusat 10710 Jakarta
 #IBAN : BRINIDJA261
 #SWIFT : BRINIDJA

Mohon menginformasikan setelah pembayaran dilakukan
 Please inform when the payment process has been done

Jl. dr. Sutomo No. 6-8 Jakarta 10710, Kotak Pos 1003 Jakarta 10010, Telp. : (021) 3841195, 3842508, 3810291-4, Fax. : (021) 3857046
 Homepage : <http://www.bps.go.id> E-mail : bpsHQ@bps.go.id

Table A.2. Malaysian data invoice



JABATAN PERANGKAAAN MALAYSIA
UNIT KHIDMAT PENGGUNA
ARAS 1, BLOK C6, KOMPLEKS C
PUSAT PENTADBIRAN
KERAJAAN PERSEKUTUAN
62514 PUTRAJAYA
Tel. : 603-8885 7000 samb./ext 7710/
: 7709/ 7708/ 7706
Faks/Fax. : 603-8889 1451/1452



1
Jabatan Perangkaan
MALAYSIA
PENJANA STATISTIK NEGARA
PRODUCER OF NATIONAL STATISTICS

INVOIS DATA

Kepada/ To: **Ms. Usha Kanagaratnam**
University of Oxford

U.P/ Attn.:
Emel/ Email: H/P:

Tarikh/ Date : **25 July 2012**

Ruj. Tuan/ Your Ref. :
Ruj. Kami/ Our Ref. : **JP/BKKP/174/1 Jld.85 (13)**

Muka Surat/ Page : **1/1**

BIL NO	KETERANGAN BARANGAN / ITEM DESCRIPTION	KUANTITI QTY	HARGA SEUNIT UNIT PRICE (RM)	JUM. HARGA TOTAL PRICE (USD)
1	Processing Data: Household Income & Basic Amenities Survey (HISBA): - HIS 1995-11,203 Household records - HIS 1997-10,966 Household records - HIS 1999-10,951 Household records - HIS 2002-11,331 Household records - HIS 2004-11,443 Household records - HIS 2007-12,136 Household records - HIS 2009-13,743 Household records (30 % Total Household & 100% variables)			66,887.53
JUMLAH/TOTAL (USD)				66,887.53

Bayaran :Bank draf/Wang Pos/Kiriman Wang mestilah dibayar kepada KETUA AKAUNTAN JPM
Payment :Bank draft/Postal Order/Money Order must be made payable to the **CHIEF ACCOUNTANT**,
PRIME MINISTER DEPARTMENT
Dimaklumkan bahawa cek syarikat tidak diterima / Kindly be informed that we do not accept company's cheque
Pembayaran di kaunter adalah secara tunai / Payment by cash at the counter

Disahkan Oleh /
Authorised By : **SAMIIHAH BAHARUDDIN**
Tarikh / Date : **25 July 2012**

Diterima Oleh /

Received By : (.....)
Tarikh Terima / Date Received :

(Harga yang diberikan adalah tertakluk kepada pindaan / Prices quoted are subject to revision without prior notice.)

Appendix B

Additional Tables for Chapter 2

Table B.1. Household expenditures, food items, SUSENAS Core questionnaire
(various survey years)

Block 1	Block 2	Block 3
	Food expenditure during previous week (bought/own production/gift)	(Indonesian Rupiah)
R 1	Cereals (rice, corn, wheat flour, rice flour, corn flour, etc.)	
R 2	Tuber (cassava, sweet potato, potato, dried cassava chip, taro, sago, etc.)	
R 3	Fish (fresh fish, salted/preserved fish, shrimp, etc.)	
R 4	Meat (beef/ buffalo/ lamb/mutton/ham/chicken, entrails, liver, spleen, shredded dried meat, dried meat, etc.)	
R 5	Egg and Milk (chicken egg/duck egg/quail egg, fresh milk, sweetened condensed milk, powdered milk, etc.)	
R 6	Vegetables (spinach, swamp cabbage, cucumber, carrot, string bean, green bean, onion, chili, tomato, etc.)	
R 7	Pulses (peanut/mung bean/ soybean/ kidney bean/lima bean/cashew nut, tofu, fermented soybean cake, fermented soybean sauce, etc.)	
R 8	Fruits (orange, mango, apple, durian, <i>rambutan</i> , snake fruit, <i>lanson</i> , pineapple, water melon, banana, papaya, etc.)	
R 9	Oil and fat (coconut oil/frying oil, coconut, butter, etc.)	
R 10	Beverages and flavours (granulated sugar, palm sugar, tea, coffee, cocoa, syrup, etc.)	
R 11	Spices and Herbs (salt, candle nut, coriander, pepper, fish paste, soybean sauce, monosodium glutamate, etc.)	
R 12	Other consumption (crisp, crisp chip, noodle, wheat & rice noodle, macaroni, etc.)	
R 13	Ready-made Food and Beverages (bread, biscuits, wet cake, porridge, meat ball, syrup ice, soda pop, salad, plate of rice and side dish, etc.)	
R 14	Alcoholic beverages	
R 15	Tobacco & betel	
R 16	Total food expenditure in the previous week (detail 1 to 15)	
	Average monthly food expenditure (R 16 Block 3 x 30/7)	

Table B.2. Household expenditures, non-food items, SUSENAS Core questionnaire
(various survey years)

Block 1	Block 2	Block 3
	Non-food expenditure during last 12 months (bought/own production/gift)	(Indonesian Rupiah)
R 17	Housing and household amenities (rents, value of imputed rent, electricity bill, telephone bill, gas, kerosene, water, wood, etc.)	
R 18	Goods and services (toiletries and cosmetics, health expenses, schooling expenses, transportation costs, other service based expenses such as maid's salary)	
R 19	Clothing, footwear & headgear (material clothes, ready-made clothes, shoes, hat, detergent, etc.)	
R 20	Durable goods (household appliances, tools, kitchen ware, amusement tools, sport equipment, expensive jewellery/ imitation jewellery, vehicles, umbrellas, watches, cameras, telephone instalment expenses, electric instalment expenses, etc.)	
R 21	Tax and Insurance (building and land tax, TV tax, vehicle tax, accident/health insurance)	
R 22	Expenses related to events & celebrations (wedding, circumcision, birthday, religious festival, traditional ceremony, etc.)	
R 23	Total non-food expenditure in the last 12 months (detail 17 to 22)	
	Average monthly non-food expenditure (R 23 Block 3)	
	12	

Table B.3. Indonesia's official poverty line valued in U.S. dollar (averaged across 2000-2009) by province, Indonesia

	COL 1	COL 2	COL 3	COL 4
	BPS per month poverty line (average 2000- 2009, valued in Rupiah)	BPS per day poverty line (average 2000- 2009, valued in Rupiah)	Adjusted PPP factor (average 2000-2009, valued in U.S dollar, at 2005 price)	BPS per day poverty line (average 2000-2009, valued in U.S dollar)
		COL 1 / 30 days		COL 2 / COL 3
Jakarta	219,831	7,328	5,791	1.27
Aceh	188,808	6,294	5,785	1.09
North Sumatera	143,531	4,784	4,324	1.11
West Sumatera	150,010	5,000	4,713	1.06
Riau	180,037	6,001	5,509	1.09
Jambi	139,805	4,660	4,383	1.06
South Sumatera	144,157	4,805	4,455	1.08
Bengkulu	135,239	4,508	4,213	1.07
Lampung	129,704	4,323	4,148	1.04
Bangka Belitung	174,755	5,825	5,321	1.09
Riau Islands	204,123	6,804	5,698	1.19
West Java	141,402	4,713	4,185	1.13
Central Java	132,075	4,402	4,052	1.09
DI Yogyakarta	148,907	4,964	4,358	1.14
East Java	133,527	4,451	4,091	1.09
Banten	146,354	4,878	4,282	1.14
Bali	152,137	5,071	4,556	1.11
West Nusa Tenggara	124,838	4,161	3,837	1.08
East Nusa Tenggara	108,128	3,604	3,534	1.02
West Kalimantan	127,405	4,247	4,053	1.05
Central Kalimantan	142,172	4,739	4,499	1.05
South Kalimantan	132,927	4,431	4,077	1.09
East Kalimantan	188,598	6,287	5,532	1.14
North Sulawesi	140,028	4,668	4,356	1.07
Central Sulawesi	133,363	4,445	4,304	1.03
South Sulawesi	115,097	3,837	3,629	1.06
Southeast Sulawesi	120,982	4,033	3,924	1.03
Gorontalo	119,075	3,969	3,820	1.04
West Sulawesi	116,861	3,895	3,799	1.03
Maluku	160,882	5,363	5,027	1.07
North Maluku	147,807	4,927	4,594	1.07
West Papua	181,220	6,041	5,620	1.07
Papua	169,946	5,665	5,374	1.05
AVERAGE across 33 provinces	148,295	4,943	4,541	1.08

Table B.4. Mismatch between poverty measures (percentage): BPS versus \$1.25 a day

	Non poor by both measures	Poor only by BPS measure	Poor only by \$1.25 a day measure	Poor by both measures of poverty
Nusa Tenggara, Maluku and Papua	51	0	19	29
Papua	46	0	14	40
West Papua	47	0	14	39
North Maluku	77	0	12	11
Maluku	50	1	16	33
East Nusa Tenggara	48	0	24	28
West Nusa Tenggara	55	1	19	25
Sulawesi	63	0	19	18
West Sulawesi	59	0	20	21
Gorontalo	55	0	18	27
Southeast Sulawesi	61	0	19	21
South Sulawesi	65	0	20	14
Central Sulawesi	56	0	21	22
North Sulawesi	75	0	14	11
Kalimantan	74	0	14	11
East Kalimantan	76	0	12	12
South Kalimantan	77	0	14	8
Central Kalimantan	77	0	14	9
West Kalimantan	68	0	17	15
Sumatera	66	1	17	17
Riau Island	80	1	8	10
Bangka Belitung	80	1	10	9
Lampung	55	1	22	23
Bengkulu	56	1	21	23
South Sumatera	60	1	20	20
Jambi	69	0	18	13
Riau	71	0	17	13
West Sumatera	72	0	15	12
North Sumatera	68	1	16	16
Aceh	57	1	15	27
Java and Bali	68	1	15	16
Bali	81	0	12	7
Banten	77	0	13	10
East Jawa	62	1	18	19
DI Yogyakarta	64	1	15	21
Central Jawa	60	1	19	20
West Jawa	74	1	12	13
DKI Jakarta	94	1	2	4
Indonesia	66	1	16	17

Table B.5. Mismatch between poverty measures (percentage): official
versus relative measure

	Non poor by both measures	Poor only by official measure	Poor only by relative measure	Poor by both measures of poverty
Nusa Tenggara, Maluku and Papua	70	12	1	17
Papua	60	14	0	25
West Papua	61	16	0	23
North Maluku	81	1	8	11
Maluku	66	17	0	17
East Nusa Tenggara	72	14	0	15
West Nusa Tenggara	74	10	0	15
Sulawesi	80	4	2	14
West Sulawesi	79	5	0	16
Gorontalo	72	10	0	18
Southeast Sulawesi	79	4	0	17
South Sulawesi	83	2	3	12
Central Sulawesi	77	7	0	16
North Sulawesi	83	0	6	11
Kalimantan	82	1	7	10
East Kalimantan	80	0	8	12
South Kalimantan	82	1	9	8
Central Kalimantan	85	0	6	9
West Kalimantan	80	3	4	12
Sumatera	79	5	3	13
Riau Island	79	0	10	11
Bangka Belitung	84	1	6	9
Lampung	77	8	0	15
Bengkulu	77	9	0	14
South Sumatera	79	7	0	14
Jambi	82	3	5	10
Riau	82	1	5	12
West Sumatera	82	2	6	10
North Sumatera	80	4	4	12
Aceh	72	10	0	18
Java and Bali	80	4	4	13
Bali	84	0	9	7
Banten	78	1	11	10
East Jawa	79	5	1	15
DI Yogyakarta	76	5	3	17
Central Jawa	79	7	0	14
West Jawa	80	2	6	12
DKI Jakarta	82	0	14	4
Indonesia	79	5	3	13

Appendix C

Additional Tables for Chapter 3

Table C.1. GDP per person (Rp'000), Indonesia, 1999-2008

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Average
DKI Jakarta	26,231	27,099	27,975	28,929	30,051	31,307	32,728	34,183	35,882	37,600	31,198
Aceh	4,777	4,995	4,943	5,305	5,469	5,533	5,568	5,977	6,314	6,296	5,518
North Sumatera	5,601	5,848	6,030	6,236	6,468	6,777	7,070	7,427	7,851	8,263	6,757
West Sumatera	5,213	5,388	5,507	5,685	5,902	6,139	6,403	6,703	7,034	7,419	6,139
Riau	5,605	5,746	5,996	6,235	6,506	6,842	7,166	7,513	7,849	8,188	6,765
Jambi	3,433	3,503	3,531	3,653	3,757	3,898	4,036	4,262	4,428	4,636	3,914
South Sumatera	4,401	4,506	4,550	4,662	4,837	5,068	5,317	5,599	5,939	6,199	5,108
Bengkulu	3,217	3,345	3,423	3,524	3,649	3,780	3,933	4,096	4,288	4,460	3,772
Lampung	3,341	3,405	3,482	3,571	3,723	3,887	4,015	4,174	4,375	4,556	3,853
Bangka Belitung	7,168	7,168	7,340	7,590	7,759	7,844	7,949	8,074	8,245	8,388	7,752
Riau Island	20,597	20,597	20,597	20,597	20,597	21,066	21,480	21,935	22,472	22,952	21,289
West Java	5,728	5,178	5,271	5,377	5,535	5,705	5,945	6,199	6,501	6,786	5,823
Central Java	3,461	3,477	3,582	3,676	3,835	4,006	4,190	4,395	4,640	4,878	4,014
DI Yogyakarta	4,216	4,319	4,454	4,603	4,762	4,951	5,130	5,263	5,433	5,648	4,878
East Java	5,645	5,823	5,999	6,177	6,419	6,740	7,077	7,427	7,816	8,216	6,734
Banten	6,536	6,536	6,604	6,685	6,829	7,014	7,222	7,414	7,648	7,872	7,036
Bali	5,623	5,705	5,777	5,822	5,899	6,038	6,237	6,425	6,661	6,910	6,110
West NT	2,403	3,042	3,224	3,296	3,383	3,544	3,561	3,616	3,749	3,810	3,363
East NT	1,981	2,059	2,112	2,170	2,222	2,292	2,322	2,389	2,461	2,527	2,253
West Kalimantan	4,804	4,825	4,906	5,079	5,187	5,383	5,531	5,764	6,055	6,328	5,386
Central Kalimantan	6,039	5,950	6,013	6,216	6,403	6,636	6,901	7,173	7,474	7,796	6,660
South Kalimantan	5,803	6,108	6,243	6,350	6,506	6,702	6,916	7,121	7,406	7,738	6,689
East Kalimantan	11,787	12,326	12,725	13,134	13,304	13,759	14,314	15,521	16,477	16,878	14,023
North Sulawesi	5,025	5,321	5,361	5,462	5,561	5,721	5,950	6,207	6,525	7,143	5,828
Central Sulawesi	3,861	4,055	4,177	4,325	4,503	4,730	4,971	5,226	5,497	5,794	4,714
South Sulawesi	3,745	3,938	4,092	4,207	4,382	4,557	4,775	5,035	5,292	5,640	4,566
Southeast Sulawesi	3,075	3,172	3,261	3,404	3,585	3,773	3,964	4,180	4,420	4,645	3,748
Gorontalo	1,768	1,768	1,823	1,896	1,980	2,070	2,168	2,274	2,390	2,519	2,066
West Sulawesi	3,042	3,042	3,042	3,042	3,042	3,042	3,042	3,166	3,312	3,615	3,139
Maluku	2,449	2,364	2,296	2,296	2,328	2,364	2,415	2,478	2,549	2,585	2,412
North Maluku	2,306	2,306	2,286	2,284	2,312	2,361	2,421	2,491	2,576	2,665	2,401
West Papua	5,643	5,643	5,643	5,643	5,823	5,962	6,138	6,350	6,648	7,003	6,050
Papua	11,400	10,931	11,284	11,249	10,635	7,812	10,104	7,939	7,858	7,352	9,656

Table C.2. Share of informal workforce (%), Indonesia, 2000-2009

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
DKI Jakarta	29	28	23	28	26	25	29	30	28	29	27
Aceh				74	70	61	64	63	53	61	64
North Sumatera	60	62	62	63	61	56	61	56	53	58	59
West Sumatera	63	68	63	67	65	65	67	59	62	65	64
Riau	63	61	58	60	56	55	57	49	48	49	56
Jambi	66	67	66	69	68	65	67	62	60	62	65
South Sumatera	72	77	74	78	75	72	70	68	65	65	72
Bengkulu	77	80	77	82	76	76	73	72	70	69	75
Lampung	75	79	74	78	74	70	70	66	65	70	72
Bangka Belitung	53	62	52	57	58	42	51	48	49	49	52
Riau Island	45	42	34	37	37	38	38	31	37	45	38
West Java	49	57	55	59	55	55	57	47	47	54	54
Central Java	56	64	62	66	65	63	65	57	56	62	62
DI Yogyakarta	59	60	52	55	58	51	56	53	53	55	55
East Java	55	63	60	64	64	61	61	55	57	62	60
Banten	49	47	45	47	45	43	47	42	39	45	45
Bali	55	61	55	60	56	55	53	57	55	57	57
West NT	66	75	73	76	74	73	75	69	70	74	73
East NT	84	86	85	86	84	83	83	81	77	79	83
West Kalimantan	72	71	70	73	71	70	72	69	70	69	71
Central Kalimantan	77	75	72	77	73	70	71	66	64	64	71
South Kalimantan	70	68	70	71	67	64	67	65	65	62	67
East Kalimantan	54	50	50	52	48	50	48	46	37	44	48
North Sulawesi	63	61	56	61	63	57	59	54	53	58	59
Central Sulawesi	71	72	74	75	74	73	70	68	68	70	72
South Sulawesi	70	70	70	71	70	66	66	66	62	64	68
Southeast Sulawesi	73	78	78	78	77	74	72	70	71	70	74
Gorontalo	72	71	67	73	66	63	65	57	56	59	65
West Sulawesi	83	82	86	82	82	79	79	78	69	69	79
Maluku		71		76	68	72	73	72	73	69	72
North Maluku		71		73	78	74	76	73	71	67	73
West Papua	70	67		68	68		74	68	66	62	68
Papua	88	84		84	79	78	82	78	74	79	81

Table C.3. Poverty level (%) (using regional BPS poverty lines), Indonesia, 2000-2009

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
DKI Jakarta	5	4	4	4	3	4	5	5	4	4	4
Aceh				30	29	34	29	27	24	22	28
North Sumatera	13	12	16	16	15	15	15	14	13	12	14
West Sumatera	12	15	12	11	11	11	13	12	11	10	12
Riau	12	12	16	15	14	13	12	11	11	10	13
Jambi	22	20	13	13	13	12	11	11	9	9	13
South Sumatera	19	16	23	22	21	21	21	19	18	16	20
Bengkulu	18	22	23	23	23	22	23	22	21	19	21
Lampung	31	25	24	23	22	21	23	23	21	20	23
Bangka Belitung	7	14	12	10	9	10	11	10	9	8	10
Riau Island	5	4	5	9	8	11	12	11	9	8	8
West Java	16	16	14	13	12	13	15	14	13	12	14
Central Java	22	23	23	22	21	21	22	20	19	18	21
DI Yogyakarta	33	25	20	20	19	19	19	19	18	17	21
East Java	23	22	22	21	20	20	21	20	19	17	20
Banten	15	18	9	10	9	9	10	9	8	8	10
Bali	6	8	7	8	7	7	7	7	6	5	7
West NT	28	30	28	27	26	26	27	25	24	23	26
East NT	37	33	31	29	28	28	30	28	26	24	29
West Kalimantan	30	19	16	15	14	14	16	13	11	9	16
Central Kalimantan	12	12	12	11	11	11	11	9	9	7	11
South Kalimantan	13	12	9	8	7	7	8	7	7	5	8
East Kalimantan	17	14	12	12	12	11	12	12	10	8	12
North Sulawesi	7	11	11	9	9	9	12	12	10	10	10
Central Sulawesi	25	25	25	23	22	22	24	23	21	19	23
South Sulawesi	16	15	15	15	14	14	15	14	13	12	14
Southeast Sulawesi	24	26	25	23	22	21	24	21	20	19	22
Gorontalo	27	30	32	30	29	29	29	28	25	26	29
West Sulawesi	18	26	24	22	19	20	21	19	17	15	20
Maluku		35		33	33	32	33	32	30	28	32
North Maluku		15		14	13	13	13	12	11	10	13
West Papua	37	34		36	35		41	40	36	36	37
Papua	50	45		40	41	41	42	41	37	38	42

Table C.4. Poverty level (%) (using \$1.25 a day poverty line), Indonesia, 2000-2009

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
DKI Jakarta	15	10	5	4	4	3	4	4	3	2	5
Aceh				54	52	46	46	41	33	26	43
North Sumatera	43	43	35	32	31	26	25	21	17	13	29
West Sumatera	44	49	34	28	27	24	24	21	17	13	28
Riau	41	43	39	32	33	26	23	19	13	11	28
Jambi	59	53	36	29	30	26	22	17	14	10	30
South Sumatera	55	53	49	41	41	38	35	31	23	19	39
Bengkulu	56	63	51	46	47	42	40	35	25	22	43
Lampung	69	66	50	46	46	42	39	36	29	24	45
Bangka Belitung	29	42	36	21	22	19	20	18	11	8	23
Riau Island	15	18	12	15	15	12	14	12	15	9	14
West Java	45	42	30	25	24	22	23	19	16	12	26
Central Java	59	60	47	41	40	36	36	30	24	19	39
DI Yogyakarta	62	54	34	32	33	28	29	25	21	17	33
East Java	57	56	43	40	40	35	33	30	24	19	38
Banten	41	44	24	22	20	17	16	15	10	10	22
Bali	27	32	21	18	17	14	14	11	8	6	17
West NT	65	64	52	48	44	42	42	36	30	25	45
East NT	75	72	62	57	55	51	50	43	38	31	53
West Kalimantan	63	56	41	32	32	29	29	22	17	12	33
Central Kalimantan	39	41	31	29	28	24	23	19	14	10	26
South Kalimantan	42	41	23	19	20	16	17	14	11	7	21
East Kalimantan	42	37	27	23	23	17	17	16	12	8	22
North Sulawesi	34	42	30	19	25	21	24	20	15	13	24
Central Sulawesi	59	58	52	47	44	41	40	37	29	25	43
South Sulawesi	50	48	40	35	33	28	27	24	20	16	32
Southeast Sulawesi	58	58	50	45	42	41	41	36	29	26	43
Gorontalo	74	66	58	52	48	48	46	40	31	31	49
West Sulawesi	56	63	52	48	43	40	37	34	22	18	41
Maluku		64		56	54	50	48	43	39	34	49
North Maluku		49		36	32	29	25	22	20	14	28
West Papua	59	56		51	54		53	49	48	39	51
Papua	73	63		57	58	52	53	48	46	42	55

Table C.5: Fixed effects (FE) estimates predicting the association between GDP (adjusted for different time-lags) and BPS poverty, Indonesia, 2000-2009

	Model 2a	Model 2b	Model 2c
	with one-year time-lag GDP)	with two-year time-lag GDP)	GDP averaged across three previous years)
Ln(GDP) per person	-8.29*** (1.34)	-8.69*** (1.41)	-9.58*** (1.49)
Share of informal workers	0.14*** (0.04)	0.15*** (0.03)	0.14*** (0.03)
Constant	137.33*** (22.14)	142.97*** (23.11)	157.34*** (24.40)
N	290	290	290

Note 1: *, ** and *** denote significance at the 5%, 1% and 0.1% level.

Note 2: The lack of province-level GDP data for 1998 meant poverty data for 2000 was not included in the analysis.

Table C.6: Fixed effects (FE) estimates predicting the association between GDP growth and poverty, Indonesia, 2000-2009

	Model 2d
Economic growth	-5.31* (6.39)
Share of informal workers	0.27*** (0.03)
Constant	11.59 (16.06)
N	290

Note: *, ** and *** denote significance at the 5%, 1% and 0.1% level.

Table C.7: Fixed effects (FE) estimates predicting the association between GDP and \$1.25 a day poverty, by major regional islands, Indonesia, 2000-2009

	Model 5a: Java	Model 6a: Sumatera	Model 7a: Kalimantan	Model 8a: Sulawesi	Model 9a: NT, Maluku & Papua
Ln GDP per person	-85.95*** (8.18)	-98.69*** (6.47)	-132.98*** (15.51)	-67.81*** (8.45)	-45.40*** (11.86)
Share of informal workforce	0.25 (0.27)	0.14 (0.15)	-0.85 (0.42)	0.76** (0.24)	1.66*** (0.40)
Constant	1369.70*** (133.83)	1565.76*** (107.39)	2186.74*** (267.96)	1013.12*** (140.16)	608.94** (177.13)
N	70	97	40	60	53

Note: *, ** and *** denote significance at the 5%, 1% and 0.1% level.

Table C.8: Fixed effects (FE) estimates predicting the association between GDP and \$1.25 a day poverty, by time period, Indonesia, 2000-2009

	Model 10a: 2002-2003	Model 11a: 2003-2005	Model 12a: 2006-2009
Ln GDP per person	-82.67*** (21.52)	-23.92*** (4.68)	-93.76*** (7.05)
Share of informal workers	0.76** (0.28)	0.41*** (0.08)	0.08 (0.11)
Constant	1272.66*** (331.33)	377.08*** (74.68)	1481.48*** (110.14)
N	90	131	99

Note: *, ** and *** denote significance at the 5%, 1% and 0.1% level.

Appendix D

Additional Tables for Chapter 4

Table D.1. Percentage distribution of individual's employment status by level of education, Indonesia, 2000-2009

	Formal worker	Informal worker	Unemployed	Inactive	Total	N
No qualification/education	12	46	1	41	100	1,304,193
Islamic primary	15	39	3	43	100	85,034
General primary	17	43	3	37	100	1,706,038
Islamic lower secondary	18	34	6	42	100	111,570
General lower secondary	25	33	6	36	100	811,848
Islamic upper secondary	25	31	9	36	100	60,829
Vocational upper secondary	46	20	9	24	100	324,383
General upper secondary	37	23	9	31	100	746,843
Tertiary	66	10	7	17	100	301,239
Total	24%	36%	5%	35%	100%	5,451,978

Table D.2. Multinomial logistic regression analyses of the association between individual's highest level of education and their employment status, Indonesia, 2000-2009, results as odds ratio (standard errors in parentheses)

	Employment status					
	Column 1 Formal versus Informal worker		Column 2 Unemployed versus Informal worker		Column 3 Inactive versus Informal worker	
<i>Ref: No formal qualification</i>						
Islamic primary	1.13***	(0.02)	0.98	(0.03)	1.13***	(0.01)
General primary	1.23***	(0.01)	0.94***	(0.01)	1.04***	(0.004)
Islamic lower secondary	1.37***	(0.02)	1.47***	(0.03)	1.36***	(0.02)
General lower secondary	1.86***	(0.01)	1.70***	(0.02)	1.36***	(0.01)
Islamic upper secondary	2.03***	(0.03)	2.82***	(0.07)	1.30***	(0.02)
Vocational upper secondary	4.84***	(0.04)	4.92***	(0.07)	1.47***	(0.01)
General upper secondary	3.56***	(0.02)	4.17***	(0.05)	1.58***	(0.01)
Tertiary	15.36***	(0.16)	11.49***	(0.20)	1.63***	(0.02)
Age	0.98***	(0.0001)	0.89***	(0.001)	0.99***	(0.006)
Female	0.94***	(0.004)	1.89***	(0.01)	14.43***	(0.05)
Dependency ratio	0.91***	(0.03)	0.53***	(0.01)	1.00	(0.003)
Rural	0.41***	(0.004)	0.49***	(0.01)	0.66***	(0.004)
Log pseudolikelihood	-1,230,000,000					
Pseudo R ²	0.22					

Note 1: *** p<0.001; ** p<0.01; * p<0.05;

Note 2: Coefficients on province dummies and survey year dummies are not reported;

Note 3: N=5,451,978

Table D.3. Logistic Regression predicting individual's poverty outcome by their level of education, results as odds ratio

ratio	Model 2a	
<i>Ref: No formal qualification</i>		
Primary	0.76***	(0.004)
Lower secondary	0.52***	(0.005)
Higher	0.26***	(0.006)
<i>Ref: Employed as formal worker</i>		
Informal worker	1.22***	(0.005)
Unemployed	1.97***	(0.009)
Economically inactive	1.37***	(0.006)
Islamic education (<i>ref: non-Islamic</i>)	1.20***	(0.008)
Age	0.98***	(0.0002)
Female	0.82***	(0.004)
Dependency ratio	2.12***	(0.005)
Avg schooling years of other HH adults	0.93***	(0.0002)
Rural	0.74***	(0.004)
Log pseudolikelihood	-499,000,000	
Pseudo R-Squared	0.11	

Note 1: *** p<0.001; ** p<0.01; * p<0.05;

Note 2: Coefficients on province dummies and survey year dummies are not reported;

Note 3: N=5,451,978

Table D.4. Multilevel logistic regression predicting individual's poverty outcome by their level of education, results as odds ratio (based on 5% sample)

	Model 2b	
<i>Ref: No formal qualification</i>		
Primary	0.75***	(0.01)
Lower secondary	0.55***	(0.01)
Higher	0.30***	(0.01)
<i>Ref: Employed as formal worker</i>		
Informal worker	1.30***	(0.02)
Unemployed	1.97***	(0.06)
Economically inactive	1.40***	(0.03)
Islamic education (<i>ref: non-Islamic</i>)	1.12***	(0.03)
Age	0.98***	(0.0005)
Female	0.83***	(0.01)
Dependency ratio	2.11***	(0.02)
Avg schooling years of other HH adults	0.93***	(0.0002)
Rural	0.78***	(0.01)

Note 1: *** p<0.001; ** p<0.01; * p<0.05;

Note 2: Coefficients on survey year dummies are not reported;

Note 3: N=5,451,978 (Level 1) and 33 (Level 2)

Table D.5. Logistic regression analyses of individuals in poverty versus not in poverty by major regional island, results as odds ratio: interactions with employment status added

	Model 5a		Model 5b		Model 5c		Model 5d		Model 5e	
	Java		Sumatera		Kalimantan		Sulawesi		Nusa Tenggara, Maluku & Papua	
<i>Ref: No formal qualification</i>										
Primary	0.69***	(0.01)	0.78***	(0.02)	0.75***	(0.03)	0.82***	(0.03)	0.69***	(0.03)
Lower secondary	0.44***	(0.01)	0.54***	(0.01)	0.55***	(0.03)	0.58***	(0.02)	0.47***	(0.03)
Higher	0.17***	(0.00)	0.24***	(0.01)	0.26***	(0.01)	0.23***	(0.01)	0.18***	(0.01)
<i>Ref: Employed as formal worker</i>										
Informal worker	1.04**	(0.01)	1.06**	(0.02)	1.18***	(0.04)	1.16***	(0.03)	1.33***	(0.05)
Unemployed	1.36***	(0.05)	1.52***	(0.08)	2.07***	(0.15)	1.35***	(0.08)	1.27***	(0.09)
Economically inactive	1.25***	(0.02)	1.20***	(0.03)	1.27***	(0.05)	1.32***	(0.04)	1.35***	(0.05)
<i>Interaction (ref: No qualification x formal worker)</i>										
Primary x informal worker	1.09***	(0.02)	1.03	(0.03)	1.02	(0.05)	0.90**	(0.04)	1.08	(0.05)
Primary x unemployed	1.44***	(0.06)	1.15*	(0.07)	0.87	(0.08)	0.99	(0.08)	1.33**	(0.12)
Primary x inactive	1.05**	(0.02)	0.98	(0.03)	0.95	(0.04)	0.88**	(0.04)	1.09	(0.06)
Lower secondary x informal worker	1.15***	(0.02)	1.11***	(0.03)	1.08	(0.06)	1.02	(0.05)	1.22***	(0.07)
Lower secondary x unemployed	1.58***	(0.06)	1.31***	(0.08)	0.94	(0.09)	1.26**	(0.10)	1.47***	(0.14)
Lower secondary x inactive	1.06**	(0.02)	1.04	(0.03)	0.91	(0.05)	0.97	(0.05)	1.09	(0.06)
Higher x informal worker	1.58***	(0.04)	1.63***	(0.05)	1.47***	(0.08)	1.75***	(0.08)	2.19***	(0.11)
Higher x unemployed	1.75***	(0.07)	1.67***	(0.09)	1.13	(0.10)	1.57***	(0.12)	2.24***	(0.18)
Higher x inactive	1.25***	(0.03)	1.37***	(0.04)	1.13*	(0.06)	1.51***	(0.07)	1.58***	(0.08)
Islamic education	1.18***	(0.01)	1.17***	(0.02)	1.23***	(0.03)	1.10***	(0.03)	1.13***	(0.03)
Age	0.98***	(0.0002)	0.98***	(0.0003)	0.98***	(0.001)	0.98***	(0.0004)	0.99***	(0.001)
Female	0.80***	(0.01)	0.86***	(0.01)	0.89***	(0.01)	0.86***	(0.01)	0.86***	(0.01)
Dependency ratio	2.12***	(0.01)	2.11***	(0.01)	2.15***	(0.02)	2.22***	(0.02)	2.07***	(0.02)
Avg schooling years of other HH adults	0.93***	(0.00)	0.93***	(0.00)	0.92***	(0.00)	0.93***	(0.00)	0.93***	(0.01)
Rural	0.76***	(0.0005)	0.57***	(0.01)	0.77***	(0.01)	0.94***	(0.01)	0.85***	(0.01)
Constant	0.25***	(0.01)	1.50***	(0.04)	0.64***	(0.03)	0.30***	(0.01)	0.74***	(0.03)
Log pseudolikelihood	-306,700,000		-98,441,367		-22,163,063		-34,838,393		-34,479,901	
N	2,067,946		1,475,484		595,941		776,016		536,591	
Pseudo R-Squared	0.11		0.09		0.09		0.10		0.11	

Note 1: *** p<0.001; ** p<0.01; * p<0.05; Note 2: Coefficients on survey year dummies and province dummies (within each regional islands) are not reported.

Appendix E

Additional Tables for Chapter 5

Table E.1. Percent (weighted) distribution of household head's highest educational qualification and employment status by type of household headship, Indonesia, 2000-2009

	Household head's level of education (%)					Household head's employment status (%)					Number of households
	No formal education	Primary	Lower secondary	Higher secondary & more	Total	Formal worker	Informal worker	Un-employed	Inactive	Total	
Male head, married (couple household)	26	33	14	26	100	34	55	1	10	100	1,853,112
Female head, <i>de facto</i>	38	32	13	17	100	15	37	2	46	100	24,312
Female head, divorce (<i>de jure</i>)	49	29	10	13	100	22	45	2	31	100	40,977
Female head, widow (<i>de jure</i>)	67	20	6	6	100	9	35	1	55	100	202,755
Other, single headship household	29	24	12	35	100	31	40	2	27	100	139,724
Average, 2000-2009	31%	32%	13%	24%	100%	31%	52%	1%	16%	100%	2,260,881

Table E.2. Percent (weighted) and frequency (in parentheses) distribution of household head's employment status by level of educational attainment and type of household headship, Indonesia, 2000-2009

	Household head with no formal education				Household head with completed primary education				Household head with completed lower secondary education				Household head with completed higher secondary or more				Total
	In active employment		Out of active employment		In active employment		Out of active employment		In active employment		Out of active employment		In active employment		Out of active employment		
	Formal worker	Informal worker	Un-employed	Inactive	Formal worker	Informal worker	Un-employed	Inactive	Formal worker	Informal worker	Un-employed	Inactive	Formal worker	Informal worker	Un-employed	Inactive	
Male head, married	17 (79,341)	69 (329,092)	1 (3,857)	14 (66,695)	25 (152,523)	66 (397,490)	1 (5,558)	8 (47,666)	37 (106,302)	54 (152,536)	1 (3,343)	8 (22,312)	62 (302,753)	29 (141,275)	1 (5,826)	8 (40,617)	1,853,112
Female head, de facto	10 (905)	44 (3,980)	1 (118)	45 (4,105)	11 (842)	41 (3,072)	2 (135)	46 (3,476)	12 (425)	31 (1,087)	2 (62)	54 (1,879)	37 (1,515)	19 (785)	2 (71)	43 (1,771)	24,312
Female head, divorce	15 (2,867)	48 (9,296)	1 (274)	36 (7,058)	21 (2,447)	48 (5,530)	2 (229)	29 (3,344)	27 (1,132)	45 (1,904)	3 (111)	26 (1,119)	30 (2,484)	19 (1,453)	1 (136)	50 (1,240)	40,977
Female head, widow	7 (9,404)	35 (46,934)	1 (1,013)	57 (76,653)	10 (3,915)	39 (15,784)	1 (267)	51 (20,420)	10 (1,210)	32 (4,030)	1 (104)	58 (7,242)	30 (4,094)	19 (2,521)	1 (129)	50 (6,757)	202,755
Other, single headship	12 (9,404)	54 (46,934)	1 (1,013)	33 (76,653)	23 (3,915)	57 (15,784)	1 (267)	19 (20,420)	40 (1,210)	42 (4,030)	2 (104)	17 (7,242)	49 (4,094)	15 (2,521)	4 (129)	32 (6,757)	139,724
Average, 2000-2009	14% (97,324)	60% (410,615)	1% (5,688)	25% (165,975)	24% (167,147)	63% (440,535)	1% (6,628)	12% (80,956)	36% (116,027)	52% (166,906)	1% (3,947)	11% (35,441)	60% (335,698)	27% (153,513)	1% (8,032)	12% (66,448)	2,260,881

Table E.3. Percent (weighted) distribution of other adult household members (excluding household head) in employment by type of household headship, Indonesia, 2000-2009

	No additional employed member	1 additional employed member	2 or more additional employed member	Number of households
Male head, married	52	33	14	1,853,112
Female head, <i>de facto</i>	69	22	10	24,312
Female head, divorce (<i>de jure</i>)	66	24	10	40,977
Female head, widow (<i>de jure</i>)	54	29	17	202,755
Other, single headship household	68	22	10	139,724
Average, 2000-2009	54	32	14	2,260,881

Table E.4. Percent (weighted) distribution of number of young children (0-18 years) by type of household headship, Indonesia, 2000-2009

	Have no young children	Have 1 or more young children	Number of households
Male head, married	21	79	1,853,112
Female head, <i>de facto</i>	29	71	24,312
Female head, divorce (<i>de jure</i>)	44	56	40,977
Female head, widow (<i>de jure</i>)	59	41	202,755
Other, single headship household	69	31	139,724
Average, 2000-2009	28%	72%	2,260,881

Note 1: Definition excludes children between age of 10-18 years who are in full-time employment

Table E.5. Regression predicting household in poverty, results as odds ratio: a comparison between logistics regression (unweighted) and multilevel regression models (Model 7a is the same as Model 7 but without weights)

	Model 7a		Model 7b	
	Logistic regression (without weight)		Multilevel regression	
Type of headship (ref: male head, married)				
Female head, <i>de facto</i>	0.86***	(0.017)	0.85***	(0.017)
Female head, divorce (<i>de jure</i>)	1.09***	(0.018)	1.08***	(0.018)
Female head, widow (<i>de jure</i>)	0.89***	(0.008)	0.89***	(0.007)
Other, single headship	0.58***	(0.007)	0.55***	(0.006)
Employment status of head (ref: formal worker)				
Informal worker	1.34***	(0.007)	1.33***	(0.007)
Unemployed	1.78***	(0.037)	1.76***	(0.037)
Economically inactive	1.32***	(0.011)	1.32***	(0.011)
Education of head (ref: higher secondary qualification or higher)				
No formal qualification	3.68***	(0.029)	3.67***	(0.029)
Primary qualification	2.92***	(0.022)	2.90***	(0.022)
Lower secondary qualification	2.03***	(0.018)	2.00***	(0.017)
Type of education of head (ref: national qualification)				
Islamic qualification	1.14***	(0.015)	1.14***	(0.015)
Age group of head (ref: 30-49 years)				
15-29 years	1.14***	(0.009)	1.12***	(0.009)
50-69 years	1.10***	(0.006)	1.10***	(0.006)
70 years and more	1.13***	(0.011)	1.13***	(0.011)
Employment ratio of other householders	1.12***	(0.006)	1.10***	(0.006)
Average years of schooling of other householders	0.60***	(0.002)	0.60***	(0.002)
Number of children	1.60***	(0.003)	1.60***	(0.003)
Constant	0.07***	(0.001)	0.07***	(0.001)
Log likelihood	-759,959		-760,105	
Pseudo R-Squared	0.17			
SD (province)			0.59	

Note 1: *** indicate statistical significance at the 0.1% level.

Note 2: Model 7a include coefficients on province dummies that are not reported.

Note 3: N=2,263,313, while for Model 7b, Level 2 is 33.

Table E.6. Logistic regression analyses of household in poverty versus not in poverty by major regional island, results as odds ratio: interactions with employment status and number of children added

	Model 8a		Model 8b		Model 8c		Model 8d		Model 8e	
	Java		Sumatera		Kalimantan		Sulawesi		Nusa Tenggara, Maluku & Papua	
Type of headship (ref: male head, married)										
Female head, <i>de facto</i>	0.71***	(0.03)	1.10	(0.07)	1.00	(0.13)	1.07	(0.07)	0.75***	(0.04)
Female head, divorce	0.96	(0.03)	1.35***	(0.06)	1.36***	(0.10)	1.35***	(0.07)	1.00	(0.06)
Female head, widow	0.77***	(0.01)	1.05*	(0.02)	1.27***	(0.06)	1.10**	(0.03)	0.98	(0.03)
Other, single headship	0.56***	(0.01)	0.66***	(0.02)	0.76***	(0.04)	0.66***	(0.03)	0.66***	(0.02)
Employment status of head (ref: formal worker)										
Informal worker	1.21***	(0.01)	1.15***	(0.02)	1.34***	(0.04)	1.38***	(0.03)	1.89***	(0.05)
Unemployed	1.84***	(0.07)	1.79***	(0.11)	2.15***	(0.20)	1.72***	(0.14)	1.93***	(0.19)
Economically inactive	1.22***	(0.02)	1.29***	(0.03)	1.33***	(0.06)	1.30***	(0.05)	1.89***	(0.07)
Education of head (ref: higher secondary qualification or higher)										
No formal qualification	5.62***	(0.10)	2.92***	(0.05)	3.24***	(0.12)	3.35***	(0.09)	3.70***	(0.10)
Primary qualification	4.32***	(0.07)	2.47***	(0.04)	2.55***	(0.09)	2.59***	(0.06)	2.75***	(0.07)
Lower secondary qualification	2.51***	(0.05)	1.81***	(0.03)	1.86***	(0.07)	1.98***	(0.06)	1.99***	(0.06)
Type of education of head (ref: national qualification)										
Islamic qualification	1.10***	(0.003)	1.14***	(0.04)	1.24***	(0.06)	1.20**	(0.07)	1.23***	(0.07)
Age group of head (ref: 30-49 years)										
15-29 years	1.11***	(0.02)	1.22***	(0.02)	1.08*	(0.04)	1.21***	(0.03)	1.21***	(0.03)
50-69 years	1.19***	(0.01)	1.18***	(0.02)	1.15***	(0.03)	1.06***	(0.02)	0.96*	(0.02)
70 years and more	1.35***	(0.02)	1.26***	(0.04)	1.28***	(0.07)	1.13**	(0.04)	1.05	(0.05)
Employment ratio of other householders	1.06***	(0.01)	0.99	(0.01)	1.17***	(0.03)	1.11***	(0.02)	1.30***	(0.02)
Average years of schooling of other householders	0.63***	(0.01)	0.61***	(0.01)	0.53***	(0.01)	0.50***	(0.01)	0.57***	(0.01)
Number of children	1.76***	(0.01)	1.73***	(0.01)	1.76***	(0.02)	1.69***	(0.01)	1.71***	(0.01)
Log pseudo-likelihood	-112,500,000		-34,590,056		-7,589,346		-12,037,212		-12,684,805	
N	873,113		608,838		244,183		313,006		221,741	
Pseudo R-Squared	0.16		0.15		0.15		0.17		0.18	

Note 1: *** p<0.001; ** p<0.01; * p<0.05;

Note 2: Coefficients on province dummies are not reported;

Note 3: Children are defined as those age 0-18 years. Definition excludes those in full-time employment.

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