

Drivers of Household Income Distribution Dynamics in the Philippines*

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Using counterfactual simulations, we investigate the various factors that could explain the changes observed in poverty and inequality in the Philippines over the past decade. To do this, we decomposed per capita household income as a stochastic function of various forms of socio-economic capital and the socio-economic returns to capital. The results indicate that the higher levels of ownership of assets and higher economic returns to formal and non-agricultural employment have contributed to lower poverty while human capital and access to basic services remain stagnant and thus, had no impact on poverty and inequality. In general, we find that the impact of changes in socio-economic capital and changes in economic returns to capital as offsetting forces that contribute to slow poverty and inequality reduction despite the rapid economic growth that the Philippines has experienced over the past ten years.

Keywords income decomposition, counterfactual simulation,
poverty, inequality

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1. Introduction

Over the recent years, the Philippine economy has been growing at break-neck speed. For instance, the country's gross domestic product (GDP) expanded by 7.2% in 2013, the fastest among the ASEAN-5 countries and almost at par with China's 7.7% (CEIC, 2013).¹ Economists expect that this rosy picture of economic growth is likely to continue in the medium-term. In particular, a World Bank (WB) report estimates that the country will grow by 6.6% in 2014 and 6.9% in 2015 (WB, 2014). However, as the Philippines navigates through a rapid economic growth regime, it is apparent that there are road blocks that have to be cleared in order to make the benefits of high economic growth rates accessible to every Filipino. Two of the most critical developmental issues that need immediate attention are poverty and inequality which have perennially plagued the development landscape in the country. For instance, although the country's per capita GDP has been growing at an annual rate of 4% since 2009 (WDI, 2013), the proportion of the population living below the national poverty line barely changed from 26.3% in 2009 to 25.2% in 2012 (NSCB, 2013). Furthermore, the level of income inequality in the Philippines remains one of the highest within Asia with recent estimates showing that Filipinos in the richest decile are 13 times richer than those in the poorest decile (WDI, 2013). Thus, solely relying on economic growth to gauge the pace of development in the Philippines can be misleading (ADB, 2013; Mahangas and Guerrero, 2009).

A good understanding of how much various factors affect poverty and inequality is important for strategic planning and policy making as it allows socio-economic planners devise policy interventions that could help economic growth achieve maximum impact on reducing socio-economic deprivation. For instance, if one finds that changes in employment income drive upward mobility, labour market policies that promote growth in sectors where most of the poor are should become the focus. On the other hand, if economic shocks drive downward mobility, policy makers should strengthen social safety nets. In the Philippines, several studies have attempted to identify why poverty and inequality remain high despite faster economic growth (e.g., Aldaba, 2009; ADB, 2007; Schelzig 2005; Balisacan and Hill, 2003) by identifying factors that correlate with these two phenomena. However, solely relying on correlations make it hard to gauge the extent to which perturbations in different factors would affect the distribution of household income. For example, although many of the existing studies in the recent years suggest that sub-optimal employment outcomes highly correlate with higher poverty (ADB, 2011; ILO, 2009), they are silent about how much of the observed changes in poverty levels can actually be attributed to the changes in employment outcomes. The main objective of this study is to contribute to the existing literature in identifying proximate determinants of poverty and inequality dynamics in the Philippines. Using a novel accounting method proposed by Azevedo, Nguyen and Sanfelice (2012), the paper departs from the conventional

correlation-based approaches by carrying out a series of counterfactual simulations to decompose the changes in poverty and inequality into the contribution of changes in various correlates of socio-economic well-being. Compared to the conventional correlation-based approaches, the result of such an accounting tool is easier to interpret and facilitate a more straightforward ranking of the relative importance of each factor in driving poverty and inequality because the estimated contributions sum up to the observed changes in poverty and inequality. In turn, this suggests how to prioritize policy intervention programs to induce better household income distribution outcomes in the country.

In identifying the factors that have contributed to the observed household income distribution dynamics, we examine the extent to which changes in poverty and inequality depend on the changes in people's socio-economic capital or to changes in the economic returns to these capital. Simply put, a socio-economic capital (SEC) can be viewed as an economic tool that a person can use to extract the available wealth in the society to be able to improve his/her well-being. The type of education, employment and assets held are examples of SECs.² In general, each SEC is valued differently. For example, having a college education does not necessarily have the same impact on a person's well-being as having a small parcel of land. We refer to this value as socio-economic returns (SER). In addition to employment, many studies have highlighted the importance of having higher skill set through better educational qualification in promoting upward mobility (Greenstone, Looney, Patashnik and Yu, 2013; Morgan, Grusky and Fields, 2006). Some studies, particularly in the Philippines, have also stressed the limited access to basic social services and productive assets as underlying cause of poverty and inequality (Balisacan, 2007). However, how changes in the returns to various forms of capital contribute to the evolution of household income distribution in the Philippines remains an empirical issue. For instance, as the supply of a specific form of socio-economic capital increases, we would expect for its corresponding economic returns to decline assuming that the demand for such capital remains fixed. This trade-off between capital and economic returns make it less straightforward to infer how poverty and inequality would change. It may lead to either poverty reduction if low income households are acquiring additional capital faster than economic returns are dropping or increasing poverty if economic returns are deteriorating faster than the rate at which low income households are acquiring additional capital. In this study, we investigate which of these scenarios hold in the Philippines by addressing the following questions:

- Are changes in households' socio-economic capital and/or changes in returns to capital important in explaining the evolution of poverty and inequality in the Philippines?
- What are the socio-economic factors that have contributed significantly to changes in poverty and inequality in the Philippines over the past decade?

To answer these questions, we use the longitudinal sub-sample data from the Philippine Family Income and Expenditure Survey and Labour Force Survey conducted in 2003, 2006 and 2009. Throughout the study, estimates are presented at the national and (broad) regional levels. Our empirical investigation leads to several interesting findings. First, our counterfactual simulations suggest that changes in the levels of asset ownership and higher returns to employment in the formal and non-agriculture sectors have contributed to lower average income shortfall from the US\$2 poverty line. The results also depart from the conventional wisdom that only portrays poverty and inequality as a simple lack of socio-economic capital of those who are at bottom of the social pyramid. In particular, we find that the slow reduction in poverty and inequality over the past decade can also be attributed to the offsetting effect between the changes in the various forms of capital held by Filipino households and the changes in its corresponding economic returns. Furthermore, we find that a non-negligible portion of the changes in poverty and inequality can be attributed to the impact of economic shocks when we used the models' residuals as indicators of shocks.

The rest of this paper is outlined as follows. The next section provides a brief background of the economic history of the Philippines. In the third section, we describe the analytical framework for estimating the contribution of different factors to observed changes in the income distribution. The fourth section describes the survey data and the definitions used in this study. The fourth section presents results of the decomposition analysis and we conclude with a discussion and summary of the key findings.

2. Background of Economic Development in the Philippines

From 1980s to 1990s, the economic growth performance of the Philippines has been characterized by several boom and bust cycles (Canlas, Khan and Zhuang, 2009). However, in the 2000s, the country shifted from being an economic laggard to a key player in Southeast Asia (Martinez et al., 2014). Today, estimates suggest that the Philippines is in a rapid economic growth regime and this is likely to continue in the coming years (WB, 2014; UNDESA, 2014). The previous decade is an interesting case study for examining the underlying factors of the household income distribution outcomes in the Philippines for several reasons. For instance, this period marks the transition of the country from moderate to rapid economic growth. In particular, the country posted an annual average of 2.8% growth in terms of per capita GDP from 2003 to 2009. This is about twice as fast as its average income growth rate in the previous two decades. However, the 2.8% GDP growth is only accompanied by a 0.2 percentage point reduction in US\$2 poverty gap, from 14.2 in 2003 to 12.5 in 2009. Income inequality as measured by the Gini coefficient remains persistently high, posting only a 0.1 percentage point reduction in inequality per year, from 42.8 in 2003 to 41.4 in 2009. In the past, the persistence of poverty and inequality has been mainly attributed to slow

economic growth (Aldaba, 2009; Schelzig, 2005 and Balisacan, 2001). Given that the country's economy is growing at a much faster rate over the past decade, slow economic growth is no longer a palatable explanation for nil changes in poverty and inequality. Hence, researchers carrying out diagnostic assessment to identify the binding constraints that are preventing the country from taking-off despite high economic growth have focused on examining the distributional impact of economic growth. Most of their findings point to the lack of access of the poor to human capital development opportunities, basic social services, productive assets and social safety nets as factors contributing to the low growth elasticity of poverty (Aldaba, 2009; Canlas, Khan and Zhuang, 2009; Schelzig, 2005). On the other hand, although the role of returns to investments in socio-economic capital in driving household income distribution outcomes is widely acknowledged (Schultz, 1975), empirical studies using cross-sectional data have examined this as a separate issue due to data limitations. Nevertheless, some studies that exploit longitudinal data have hinted that the slow pace of reduction in poverty and inequality in the Philippines could be driven by various forces offsetting each other (Martinez et al., 2014). In this study, we examine how much trade-off exists between SECs and SERs in terms of reducing poverty and inequality in the country. Most of the discussion focuses on US\$2 poverty gap and Gini coefficient as measures of poverty and inequality, respectively. Nevertheless, the robustness of the findings is also briefly discussed by examining the results based on other conventional measures of poverty and inequality.

3. Concepts and Methods

3.1 Drivers of income distribution dynamics

Due to limited data on non-monetary measures of well-being, we use (log) per capita household consumption as the measure of well-being. From this point onwards, we refer to this as (log) per capita income. To be able to measure the contribution of changes in SECs and changes in SERs to the observed trends in poverty and inequality, equation (1) decomposes (log) per capita income as a stochastic function of several correlates of a household's well-being that are typically used in the existing literature (Canlas, Khan and Zhuang 2009).

$$Y_{it}^{pce} = \beta_t^{location} X_{it}^{location} + \beta_t^{hhldcomp} X_{it}^{hhldcomp} + \beta_t^{employ} X_{it}^{employ} + \beta_t^{svcs} X_{it}^{svcs} + \beta_t^{assets} X_{it}^{assets} + \varepsilon_{it} \quad (1)$$

The SECs are broadly grouped into (i) (geographic) location, (ii) education, (iii) employment, (iv) access to (basic) services and (v) physical assets.³ Several studies have highlighted the critical role of geography in explaining variations in well-being of both developed and developing countries (Aslam and Corrado

2012; Lobao, Hooks and Tickamyer, 2007). For instance, urban-rural disparities in various income and non-income measures of well-being have been well-documented in many empirical studies (WB, 2013). In general, geography can act as either a gateway to better living standards especially when a specific location is endowed with rich natural resources or to economic challenges when a location is too remote and has very limited access to various social services. In the Philippines, socio-economic development landscape has a very distinctive spatial feature wherein people living in the National Capital Region (NCR) and its neighbouring provinces have significantly lower poverty rates compared to those living in central and southern Philippines (Schelzig, 2005; Balisacan, 2003). In addition to geography, one of the recurring findings in the development literature is that higher education often leads to higher productivity and therefore, upward economic mobility prospects (Greenstone, Looney, Patashnik and Yu, 2013; Morgan, Grusky and Fields, 2006). The Philippines is one of the countries which have a high regard for education, and this perspective is deeply rooted in its culture. For many poor Filipino households, education is considered as one of the most important legacies that parents can impart to their children to be able to move away from socio-economic deprivation (Maligalig, Caoli-Rodriguez, Martinez and Cuevas, (2014). Analogously, access to (basic) services and assets are also found to be significant correlates of well-being (WB, 2004). For instance, access to high-quality healthcare services helps workers avoid employment interruptions due to sickness which in turn, allows them to continue translating their labour into financial capital (Schelzig, 2005). Similarly, many forms of physical assets (e.g., land) and technological innovations are also useful tools for extracting more wealth (Moser, 2006; Schelzig, 2005; Carter, 2000). Although all of these SECs are important, identifying which of them have the most significant impact on household income distribution outcomes will enable policymakers prioritize intervention programs. In a developing country like the Philippines, setting policy priorities and channelling the limited resources available to areas where interventions could have optimal impact is critical.

How does the relationship between SEC and SER affect household income distribution outcomes? It is worth pointing out that simply increasing households' capital levels would not necessarily guarantee better living standards (King, Montenegro, and Orazem, 2012; Schultz, 1975). For instance, if the labour force had higher stockpile of skills, it is not absolutely consequential that this would result to upward economic mobility across the board unless the demand for better-skilled workers also increases. A higher supply of skilled workers with a fixed demand for such type of labour would likely result to lower SERs. The same can be said about the other types of SECs. In this simple example, (absolute) poverty would increase if SER falls faster than the rate at which SEC is increasing for low income households and it would decrease if SEC increases faster than the

rate at which SER is falling. On the other hand, inequality would increase when SEC is increasing disproportionately faster in high income households or SER is decreasing disproportionately faster in low income households. The following section outlines the methodology for estimating the contribution of each of these factors on income distribution dynamics, separately.

3.2 Estimating the contribution of SECs and SERs to the evolution of the income distribution

Since the pioneering work of Oaxaca (1973) and Blinder (1973) who proposed methods for decomposing group differences in income into various components, substantial progress has been made in terms of understanding what contributes to income distributional variations across space and over time. The main idea behind the Oaxaca-Blinder method is to decompose income differentials (between groups) into factors that are attributable to differences in SECs and variations in the SERs. To illustrate the approach, assume the income of individual i from the g^{th} group, denoted by $Y_i^{(g)}$, is a function of his/her SEC $X_i^{(g)}$, SER $\beta^{(g)}$, and an unobserved error term $\varepsilon_i^{(g)}$ as shown in Equation 2.⁴ For simplicity, suppose we have two groups, $g=0, 1$. The main objective of the Oaxaca-Blinder decomposition method is to explain the difference in group averages denoted by $\bar{Y}^{(1)} - \bar{Y}^{(0)}$. This is done by constructing income for one group, denoted by $\bar{Y}^{(c)}$, by assuming that it has the same income structure (i.e., same SER) as the other group as shown in Equation 3. Equation 4 shows that the difference $\bar{Y}^{(1)} - \bar{Y}^{(0)}$ can be arithmetically expressed as a sum of two components where the first term corresponds to the gap in the average SEC in each group while the second term corresponds to the variation in the SER.

$$Y_i^{(g)} = \beta^{(g)} X_i^{(g)} + \varepsilon_i^{(g)} \rightarrow \bar{Y}^{(0)} = \hat{\beta}^{(0)} X_i^{(0)} \text{ and } \bar{Y}^{(1)} = \hat{\beta}^{(1)} X_i^{(1)} \quad (2)$$

$$\bar{Y}^{(c)} = \hat{\beta}^{(1)} X_i^{(0)} \quad (3)$$

$$\begin{aligned} \bar{Y}^{(1)} - \bar{Y}^{(0)} &= \left(\bar{Y}^{(1)} - \bar{Y}^{(c)} \right) + \left(\bar{Y}^{(c)} - \bar{Y}^{(0)} \right) = \\ &= \left(\hat{\beta}^{(1)} X_i^{(1)} - \hat{\beta}^{(1)} X_i^{(0)} \right) + \left(\hat{\beta}^{(1)} X_i^{(0)} - \hat{\beta}^{(0)} X_i^{(0)} \right) = \end{aligned} \quad (4)$$

$$\hat{\beta}^{(1)} \left(\bar{X}^{(1)} - \bar{X}^{(0)} \right) + \left(\hat{\beta}^{(1)} - \hat{\beta}^{(0)} \right) \bar{X}^{(0)}$$

Since its inception, the Blinder-Oaxaca decomposition technique has been used extensively to estimate the separate contributions of group differences in outcomes of interest with respect to observable characteristics like sex, education,

race, and location. Nevertheless, although the method was originally proposed to explain income discrimination between two groups for a fixed time period, the procedure can also be applied to explain temporal changes in average income of the same group. In general, the Blinder-Oaxaca decomposition method is very straightforward to apply as it only entails estimation of the coefficients of a linear regression model and the sample means of the underlying independent variables. However, the approach has two main shortcomings. First, it is limited to explaining differences in average income while differences in other parts of the income distribution are left unexplained. Second, the decomposition depends on the choice of a reference group. For example, when estimating separate wage regressions for five geographic locations, the results where the first geographic location is left-out would not necessarily be the same when the last geographic location were left-out. This portrays an identification problem wherein the results depend on an arbitrarily chosen reference group (Oaxaca and Ramson, 1999; Jones and Kelly, 1984). Over the years, several alternative decomposition methodologies have been proposed to address these limitations. Bourguignon and Ferreira (2008) and Bourguignon, Ferreira and Lustig (2005) provide a comprehensive review of the alternative approaches available in the literature.

This study adopts the procedure recently proposed by Azevedo, Nguyen and Sanfelice (ANS) (2012). Unlike the Blinder-Oaxaca method and other conventional decomposition tools which are mostly based on the means, the ANS algorithm flexibly accommodates quantiles, variance and any other characteristic features of an income distribution. Furthermore, as will be explained in the succeeding paragraphs, it also addresses the path-dependency issue common to other decomposition methods.

$$Y_{it} = f(F_{it}^1, F_{it}^2, \dots, F_{it}^{C-1}, F_{it}^C) \quad (5)$$

$$M(Y_{it}) = \phi(f(F_{it}^1, F_{it}^2, \dots, F_{it}^{C-1}, F_{it}^C)) \quad (6)$$

To illustrate the procedure, suppose we treat households as the unit of analysis and assume that there are two time periods. For notation purposes, we express the income of household i at time t as a function of C components where each component is denoted by F_{it}^c , $c = 1, 2, \dots, C$; $t = 0, 1$ (Equation 5) and the term $M(Y_{it})$ is used to denote a specific characteristic feature of the household income distribution. The main interest is to decompose the change in the characteristic feature of the income distribution between time 0 and time 1, $M(Y_1) - M(Y_0)$, into the contribution of changes $F_{i1}^c - F_{i0}^c$. The step-by-step procedure is outlined below.

**Azevedo, Nguyen and Sanfelice's (2012) Algorithm for Estimating the
Contribution of F^c on $M_1(Y_1) - M_0(Y_0)$**

Step 1: Using the formula provided below, compute the counterfactual income distributions at the initial time period and the corresponding parameter of interest $M(Y_0)^{(c)}$ for each factor F^c .

$$M(Y_0)^{(1)} = \phi\left(f\left(F_{i0}^1, F_{i0}^2, \dots, F_{i0}^{C-1}, F_{i0}^c\right)\right) = M(Y_0)$$

$$M(Y_0)^{(1)} = \phi\left(f\left(F_{i1}^1, F_{i0}^2, \dots, F_{i0}^{C-1}, F_{i0}^c\right)\right)$$

$$M(Y_0)^{(2)} = \phi\left(f\left(F_{i1}^1, F_{i1}^2, \dots, F_{i0}^{C-1}, F_{i0}^c\right)\right)$$

$$M(Y_0)^{(C-1)} = \phi\left(f\left(F_{i1}^1, F_{i1}^2, \dots, F_{i1}^{C-1}, F_{i0}^c\right)\right)$$

$$M(Y_0)^{(C)} = \phi\left(f\left(F_{i1}^1, F_{i1}^2, \dots, F_{i1}^{C-1}, F_{i1}^c\right)\right) = M(Y_1)$$

Step 2: Compute the contribution of F^c by subtracting $M_1(Y)^{(c-1)}$ from $M^1(Y)^{(c)}$.

$$\text{Contribution}(F_{i1}^c - F_{i0}^c) = M(Y_0)^{(c)} - M(Y_0)^{(c-1)} \quad (7)$$

$$\% \text{Contribution}(F_{i1}^c - F_{i0}^c) = \frac{M(Y_0)^{(c)} - M(Y_0)^{(c-1)}}{M(Y_1) - M(Y_0)} \quad (8)$$

Step 3: Repeat Steps #1 and #2 for all possible orderings of F^c 's and then take the average of (7) and (8).

At this point, important remarks are in order. First, like the Oaxaca-Blinder decomposition method, the procedure outlined in the first two steps is path-dependent. If the income measure Y_{it} is expressed as a function of F_{it}^c 's and the characteristic feature of the income distribution is some function $M()$ of Y_{it} , the idea behind the ANS algorithm is to construct a counterfactual distribution of income by changing the values of the F_{it}^c from the observed value at the initial time period to the observed value at the succeeding time period, one at a time. In the example above, we started chronologically from F_{it}^1 to F_{it}^c . Thus, the values of (7) and (8) depend on this specific ordering of the factors. However, had we started from F_{it}^c to F_{it}^1 or followed any other ordering, the results would have been different. To address this issue, the third step entails computing the contribution of each factor

across all possible permutations or “paths” and using the average to estimate the factor’s contribution on $M_1(Y_1) - M_0(Y_0)$.

Second, the approach entails estimating the contribution of one factor at a time by holding the values of all other factors constant. Hence, the decomposition methodology does not reflect economic equilibrium because it employs a simplistic assumption that each factor can be changed one at a time while the rest can be held fixed (Azevedo, Inchauster, Olivieri, Saavedra and Winkler, 2013). Nevertheless, the potential interactions between factors are partially taken into account by estimating the contribution of a specific factor as the difference between the cumulative counterfactuals.

Third, while the methodology can be used to explain the temporal differences in various forms of $M(Y_t)$, this study defines $M_t(Y_t)$ in terms of poverty and inequality only, in particular, we focus on US\$2 poverty gap and Gini coefficient (i.e., $\phi(f) = \dots$)⁵.

Fourth, to be able to construct counterfactual income distributions, the ANS algorithm requires panel data. If repeated cross-sectional data is available, the algorithm can be modified by making additional assumptions as outlined in Azevedo et al. (2013).

To estimate the contribution of the changes in SEC and SER to poverty and inequality dynamics using the ANS algorithm, each of the X_{it}^c (SEC) and the parameter β_{it}^c (SER) as well as the error term ε_{it} can be considered as one of the F_{it}^c ’s. Given that each SEC could have multiple indicators, for example, access to services can be measured in terms of access to either electricity, clean water or sanitary toilet, estimation of (7) and (8) could be very computationally-intensive due to the iterative nature of the ANS algorithm if each indicator is treated as a separate F_{it}^c . To address this issue, we decided to reduce the dimension of (1) by constructing an index for each SEC.⁶ In doing so, we followed the approach outlined in UN (2005) by estimating a regression model (of income) and using the corresponding coefficients as weights for the index. In particular, we regressed (log) per capita income on the various indicators of SECs. Since we are interested to measure the impact of changes in SEC levels to poverty and inequality dynamics, we do not want the changes in the SEC indices to be artificially contaminated by the changes in the weights of the component indicators. Thus, we use the data from the initial survey year only to derive the weights for each component indicator. These weights are then multiplied to the value of each component indicator for the initial survey year and the succeeding time periods. The resulting indices are then used as inputs for the ANS algorithm. Although the indicators included in the construction of the SEC indices in this study are similar to the ones commonly used in the existing literature (Aldaba, 2009; Montgomery, Gradnolati, Burke and Paredes, 2000), these were chosen on an ad-hoc basis, subject to data availability and the results of descriptive analysis. In general, Montgomery, et al. (2000)

argued that in the empirical literature, indicators are usually chosen on an ad-hoc basis due to lack of “best practice” approach of selecting indicators that can proxy living standards comprehensively. Furthermore, we treated the model residuals as a separate component that gauges the level of socio-economic shocks. In general, while variations in household incomes across space and over time can be mostly explained by differences in stock of socio-economic capital and economic returns, incomes could also fluctuate significantly due to unexpected shocks. A quick review of the Philippines’s economic history reveals that socio-economic shocks (e.g., environmental disasters, financial crisis, etc.) have been prominent features of the country’s development landscape (Bayudan-Dacuycuy and Lim, 2013). While a growing body of literature in the Philippines have hinted that economic shocks play a critical role in the evolution of the household income distribution (Martinez, Western, Haynes and Tomaszewski, 2014; Bayudan-Dacuycuy and Lim, 2013), not much has been said about the magnitude of impact of these shocks on poverty and inequality dynamics using a longitudinal perspective in the country. By treating the model residuals as an approximate measure of shock, we explicitly gauge how much of the changes in poverty and inequality observed in the past decade are attributable to shocks in household incomes, after accounting for the changes in SECs and SERs.

4. Data

The data from the Philippine Family Income and Expenditure Survey (FIES) and Labour Force Survey (LFS) serve as the main data sources for this study (NSO 2003, 2006, 2009). The FIES collects detailed information about the sources of household income and consumption while the LFS collects detailed information about the current employment profile of economically-active household members. Both surveys follow the 2003 Master Sample Design where about a quarter of the sample households used in previous waves are rotated back for the succeeding waves (Ericta and Fabian, 2009). In other words, the surveys are designed to have both cross-sectional and longitudinal sub-samples. In our analyses, we used the longitudinal sub-sample from the 2003, 2006 and 2009 waves.

While the longitudinal sub-sample should provide reliable national cross-sectional estimates, there are several sources of potential bias. First, the survey does not follow households that moved from a previous dwelling unit. Their exclusion could lead to non-coverage bias, but the extent and direction of bias is difficult to gauge prior hand because rich and poor households could both be geographically mobile. Second, bias may also arise from panel nonresponse when households that remained in the same dwelling unit refuse to participate in subsequent survey waves.⁷ Our preliminary investigation suggests that measures of central tendency and dispersion of household income tend to be underestimated in the longitudinal sub-sample (Table 1). To formally test whether the differences in the distributions are statistically significant, we used the Kolmogorov-Smirnov

test. This test confirms that there are significant differences in the distributions of the full cross-sectional sample and longitudinal sub-sample. To adjust for the potential bias, we introduced weights for non-coverage by estimating logistic regression models for the probability of appearing in 2003, 2006 and 2009 waves, and specifying consumption, age of household head, sex of household head and urbanicity as controls. The inverse of the predicted probabilities are multiplied by the existing survey weights. The last row of Table 1 shows the average (per capita) household consumption and measure of inequality estimated using the adjusted weights. The adjusted (weighted) estimates are closer to the full sample estimates than are the estimates from the longitudinal sub-samples. For convenience, we have restricted the analysis to data of the 6,519 households that appear in all waves. Furthermore, the income measure has been adjusted to account for inflation and spatial differences in prices.

Table 1. Comparison of full cross-sectional and longitudinal sub-sample of FIES

	2003		2006		2009	
	Mean Std Error	Gini Std Error	Mean Std Error	Gini Std Error	Mean Std Error	Gini Std Error
Full sample cross-sectional sample	1258.53 9.43	0.44 0.002	1228.05 10.88	0.441 0.003	1286.33 12.79	0.43 0.002
Longitudinal sub-sample 2003, 2006 and 2009	1138.48 28.32	0.428 0.006	1132.76 28.80	0.438 0.005	1159.69 25.86	0.414 0.004
Longitudinal sub-sample (Adjusted) 2003, 2006 and 2009	1234.84 31.30	0.431 0.006	1233.27 32.57	0.445 0.006	1267.91 29.21	0.423 0.005

In constructing the SEC indices (i.e., *Location, Education, Employment, Services* and *Assets*), we derived the weights by estimating several regression models with the (log) per capita household consumption as the dependent variable and the various indicators of SEC that are available from the survey as independent variables. Following preliminary analyses, we decided to drop indicators that are not statistically significant and have counterintuitive signs of model coefficients to be able to come-up with sound and parsimonious SEC indices. The final SEC index Location consists of four dummy variables: (i) whether the household is living in urban area, (ii) whether the household is living in the National Capital Region (NCR), (iii) whether the household is living in Luzon and (iv) whether the household is living in Visayas.⁸ The index Education has three sub-component indicators: (i) proportion of working-age household members with primary education, (ii) proportion of working-age household members with secondary education, and (iii) proportion of working-age household members with post-secondary education. Similarly, the index Employment consists of three indicators: (i) proportion of

working-age household members who are employed, (ii) proportion of employed household members working in the non-agriculture sector, (iii) proportion of employed household members with formal employment.⁹ The index Services has four dummy variables: (i) whether household has electricity at home, (ii) whether household has water faucet at home, (iii) whether household has a sealed-toilet facility and (iv) whether household has closed-pit toilet facility. Lastly, the index Assets consists of four dummy variables: (i) whether household owns house/lot, (ii) whether household owns a refrigerator, (iii) whether household owns a phone and (iv) whether households owns a car. Overall, although the resulting indices are not comprehensive, they provide a good starting point for a more nuanced understanding of how changes in SEC levels interplay with the changes in SER (i.e., *RLocation*, *REducation*, *REmployment*, *RServices* and *RAssets*) in driving household income distribution dynamics.

5. Results

5.1 Drivers of household income distribution dynamics in the Philippines

The objective of this section is to examine whether the observed changes in poverty and inequality can be attributed to changes in households' SECs or changes in the SERs. As pointed out earlier, the household income distribution dynamics is potentially shaped by how much the pace at which SECs and SERs are changing differ from each other.

Figure 1 summarizes the evolution of the distribution of each SEC index over time. The bars correspond to the mean levels of each SEC while the bands correspond to 95% confidence intervals. In the case of *Location*, the distribution does not change because we are using data from households that did not move residential location throughout the observation period. On the other hand, we observe no changes in *Education*, *Employment* and *Services*. This is consistent with the findings from previous studies which have attributed the low growth elasticity of poverty to its lack of enabling capacity to expand economic opportunities for the poor (Aldaba, 2009). In contrast, significant improvements can be observed in Assets across all survey years.

To estimate the SERs, we regressed (log) per capita income on the SEC indices for each survey year. The coefficients of the SECs are used as estimates of the SERs. Figure 2 shows how these SERs have changed over the past decade. Except for *REducation* and *REmployment*, the results provide empirical support to the hypothesis that improved SEC levels usually lead to lower SERs. In the case of *REducation*, there is a slight downward trend but the changes are not as remarkable as that of other SERs. Interestingly, we find that the *REmployment* have uniformly increased over the past ten years.

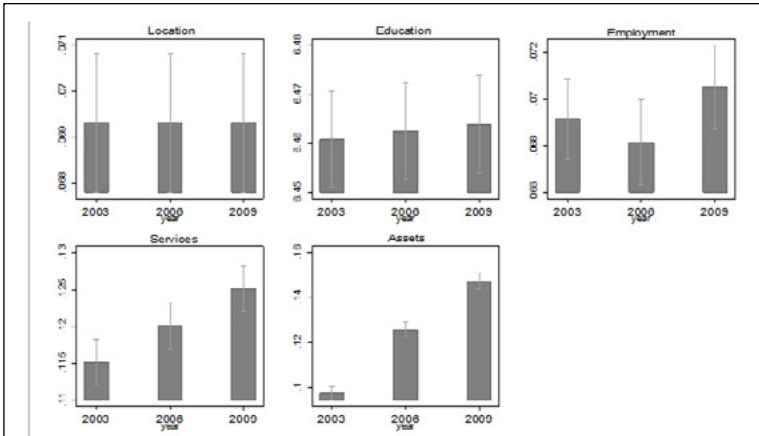


Figure 1. Temporal Changes in the Levels of Socio-Economic Capital of Filipino Households

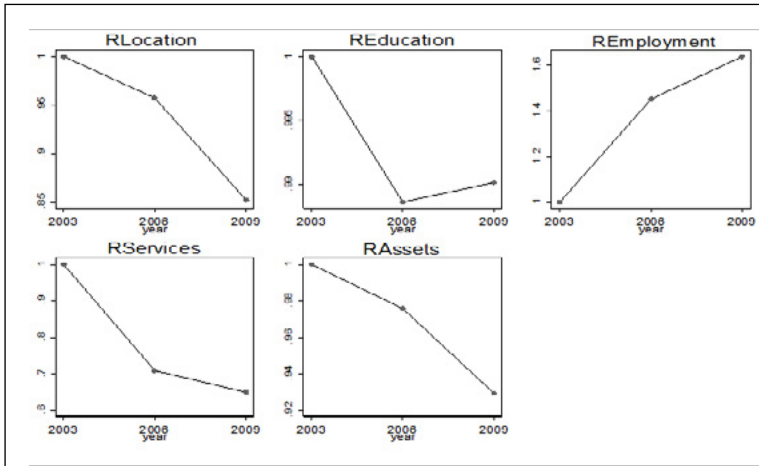


Figure 2. Temporal Changes in the Socio-Economic Returns to Socio-Economic Capital

The estimated contribution of the changes in SECs and SERs to poverty and inequality dynamics are presented in Figure 3.¹⁰ The bars represent how much each factor has contributed to the increase/decrease in poverty and inequality. Positive values indicate inflationary impact while negative values indicate deflationary impact on our income distributional measures. The number on top of each bar indicates the total change in poverty or inequality observed during the period under consideration.

Between 2003 and 2006, the results of the counterfactual simulations based on the ANS algorithm suggest that the SEC levels in terms of *Education*,

Employment and *Services* had minimal inflationary effect on the overall poverty gap. In particular, the observed changes in Education, Employment and Services would have increased the overall poverty gap by 0.1, 0.4 and 0.5 percentage points, respectively, if all other factors remained constant. On the other hand, the observed changes in Assets had negative effect on poverty from 2003 to 2006. In particular, the changes in Assets would have trimmed poverty gap by 2.4 percentage points if all other factors were held fixed. In terms of the changes in SERs, we find that the changes in REducation and RServices between 2003 and 2006 had strong poverty-inflationary impact. In particular, the observed changes in REducation and RServices would have increased the overall poverty gap by 3.7 and 2.4 percentage points, respectively, if the values of all other components were held constant during this period. Similarly, the changes in RLocation and RAssets had increasing, albeit slightly weaker, effect on poverty gap. In contrast, the changes in REmployment had a strong poverty-reducing effect, contributing to a 3.6 percentage point reduction in poverty gap between 2003 and 2006, *ceteris paribus*.

On the other hand, the increase in the Gini coefficient from 42.8 in 2003 to 44.3 in 2006 can be mostly attributed to changes in *SEmployment*. Changes in *Education* and *Employment* also contributed positively to higher inequality during this period. However, this was largely offset by the inequality-reducing impact of changes in *Services*, *Assets*, *RLocation*, *REducation*, *RServices* and *RAssets*.

From 2006 to 2009, the average income shortfall relative to the US\$2 poverty line dropped from 16.3 to 13.6. The poverty-inflationary effect of the changes in *RLocation*, *REmployment*, *RServices* and *RAssets* have been largely offset by the changes in SECs, particularly Assets and Employment which together have contributed to a 3.0 percentage point reduction in US\$2 poverty gap while the reduction in inequality during this period could be mostly attributed to the changes in Assets.

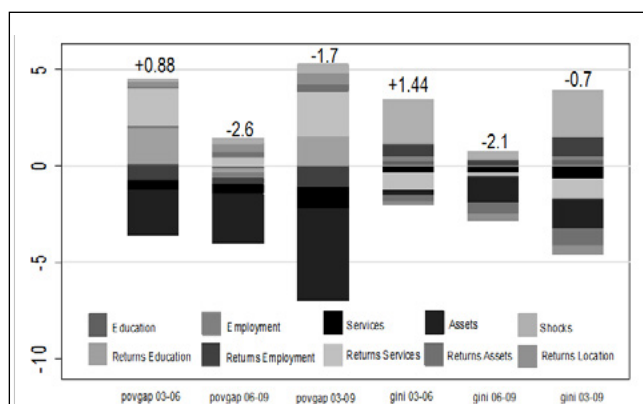


Figure 3. Estimates Contribution of Different Factors on Poverty and Inequality

In summary, the results suggest that the changes in poverty gap between 2003 and 2009 can be mainly attributed to changes in returns to education, returns to access to basic services, returns to employment and levels of asset ownership. The last two factors contributed positively to poverty reduction while the first two factors pushed poverty up. Interestingly, this has occurred at the backdrop of trivial changes in human capital (i.e., education and employment). In general, these findings depart from the conventional wisdom that the underlying cause of the country's poverty and inequality in the 1980s and 1990s is the limited access to basic social services and productive assets (Balisacan, 2007). Instead, the results highlight the need to improve human capital outcomes. For instance, given the way how *Employment* index has been constructed, the finding that it did not contribute significantly to poverty reduction suggests that the poor did not experience improvements in their chance to be employed in the non-agriculture and formal sectors. This portrays a labour market segmentation wherein the poor workers continuously experience difficulty in moving to formal, non-agriculture sectors. Since more productive sectors require higher levels of skills, the stagnant education levels, which can be used to proxy skills, could probably explain why a significant fraction of poor workers were unable to move away from less productive sectors. Nevertheless, the finding that those who successfully transitioned to formal and non-agriculture jobs have experienced improved living standards due to higher economic returns of working in these sectors highlight the importance of improving employment outcomes for tackling poverty in the Philippines.

The results also confirm that the contribution of changes in the SECs and SERs to poverty and inequality generally offset one another. This usually happens when the demand for a specific type of SEC is fixed. To explicitly show this, we summed up the contribution of SEC and SER for the five correlates of well-being considered in this study and present the results in Table 2. Here, we find that assets and employment outcomes have contributed to lower poverty gap, leading to a 4.2 and 3.6 percentage point reduction, respectively. However, this gain has been partially offset by education and services outcomes. In terms of inequality, both SECs and SERs have generally contributed to a reduction in inequality. Assets and services outcomes have the highest poverty-reducing impact while employment outcomes have contributed to increasing inequality.

In addition to SECs and SERs, we also disentangled the impact of socio-economic shocks on the observed changes in poverty and inequality. This computational exercise is important because previous studies suggest that household income are subject to different forms of socio-economic risks. For instance, Dercon (2002) noted that income from employment may be heavily affected by ill-health or financial crisis-induced unemployment. Income transfers may be reduced due to uncertain access to public goods. Income reduction and

Table 2. Trade-off between Socio-Economic Capital and Socio-Economic Returns, 2003-2009

Factor	Poverty Gap (%)			Gini (%)		
	SEC	SER	Total Contribution	SEC	SER	Total Contribution
Location	0.00	0.74	0.74	0.00	-0.57	-0.57
Education	0.00	3.34	3.34	0.30	-0.07	0.23
Employment	0.00	-3.57	-3.58	0.22	1.92	2.14
Services	-1.02	2.69	1.68	-0.59	-1.21	-1.80
Assets	-4.65	0.50	-4.15	-1.48	-1.31	-2.80
Total Contribution	-5.67	3.70	-1.97	-1.55	-1.24	-2.80

value of assets, especially in the agriculture sector, may deteriorate due to war, theft, uncertainty in land tenure or environmental shocks like earthquakes or typhoons. While the impact of these shocks is usually transient, it can also have long-term effects on a household's future economic prospects (Albert, Elloso and Ramos, 2009). Worryingly, socio-economic shocks may push poor and economically vulnerable households to further risk-induced poverty traps. In the Philippines, there are several sources of socio-economic shocks. Environmental hazards are good example. On average, about 20 tropical cyclones hit the country every year (PAG-ASA, 2013) and these cost about 0.8% of GDP in damages (Oxford Economics, 2013). Other sources of shocks that are commonly experienced by Filipino households are brought by illness, accident, unemployment, and economic crises (Albert et al., 2009).

5.2 Robustness checks

Regional estimates

In this section, we briefly examine the regional variations in terms of the contribution of SECs, SERs and socio-economic shocks to poverty and inequality dynamics over the past decade. The Philippines consists of three major island groups, Luzon, Visayas and Mindanao. Although NCR is within Luzon, we separated the two in our analysis because NCR differs significantly from the rest of Luzon in terms of average income levels. In particular, the average per capita income of households living in NCR is about 1.7 times the average per capita income in (the rest of) Luzon, 2 times in Visayas and 2.3 times in Mindanao. Not surprisingly, US\$2 poverty gap is highest in Mindanao and lowest in Visayas. Interestingly, NCR and Luzon have lower inequality than Visayas and Mindanao.

The results of the counterfactual simulations by region are presented in the appendix. Although the list of major contributing factors to the observed poverty and inequality dynamics is similar across regions, there are some spatial

differences that are worth pointing out. First, the changes observed in SECs and SERs have significantly bigger impact on poverty in poorer regions of Visayas and Mindanao while socio-economic shocks played a more pronounced role in driving the changes in poverty and inequality in NCR and Luzon. Second, for low income households in Visayas and Mindanao, the level of SECs improved much faster than the rate at which its corresponding SERs declined, thus contributing to reduction in poverty gap. The same can be said for Luzon although the offsetting effect between its SEC and SER was stronger, leading to lower reduction in poverty gap. In contrast, poverty gap in NCR slightly increased between 2003 and 2009 and this can be explained by SERs declining faster than the rate at which SECs of low income households increased.

Other measures of poverty and inequality

To examine the robustness of the results to the type of poverty and inequality indicators used, we also estimated the contribution of the changes in SECs, SERs and economic shocks to household income distribution dynamics using the proportion of population with income below US\$2 a day (headcount poverty rate) and the average squared income shortfall (poverty severity) as alternative measures for poverty and the Theil coefficient as an alternative measure for inequality. The estimates are also presented in the appendix. The results based on poverty gap and Gini coefficient are mostly similar with the results for poverty severity and Theil coefficient, respectively. However, there are some remarkable differences when we look at US\$2 headcount poverty rates. In particular, the impact of economic shocks are more pronounced when US\$2 headcount poverty rates are used instead of poverty gap. For example, it has been mentioned earlier that the economic shocks had minimal deflationary effect on poverty gap between 2003 and 2006. However, when poverty headcount is used, we find that socio-economic shocks had a significant inflationary impact, contributing to a 2.2 percentage point increase in poverty gap between 2003 and 2006. This is equivalent to a +73% contribution to the observed increase in poverty headcount during this period, compared to its -3.9% contribution to the observed increase in poverty gap. A possible reason for this is that many of those who fell into poverty due to economic shocks between 2003 and 2006 were households that had incomes that were just a little lower than the poverty line. In such case, headcount poverty is more sensitive to capture these changes than poverty gap. On the other hand, the impact of socio-economic shocks on poverty between 2006 and 2009 is consistent, regardless of the poverty measure used. On the other hand, we did not find significant differences when inequality is measured in terms of Theil index instead of the Gini coefficient.

6. Summary and Discussion

Much has been said about the Philippines's dismal performance in terms of accelerating income growth, reducing poverty and closing the gap between

the rich and the poor until 2000s. At the start of the 21st century, the country gradually moved to a faster economic growth regime. However, high levels of poverty and inequality remain a developmental obstacle that the country has to overcome, making this rapid growth episode a critical juncture. If the Philippines could address the binding constraints that contribute to the persistence of poverty and income inequality, then it can use the rapid economic growth as a window of opportunity to position itself as a major economic player within the Asia Pacific region. Otherwise, the current strong growth episode could end up as just another part of its perennial boom-bust cycle. To be able to devise policies and intervention programs that could address poverty and inequality effectively, socio-economic planners need to understand the factors that shaped the household income distribution in the country.

In this study, we used counterfactual simulations as an accounting tool to identify a set of proximate determinants of the changes in poverty and inequality over the past decade and in turn, direct us to priorities for policy. We classified the hypothesized determinants into three broad factors: socio-economic capital, socio-economic returns to capital and socio-economic shocks. Analysis of the Philippine Family Income and Expenditure Survey and Labour Force Survey suggests that while the causes of poverty and inequality are diverse, we found empirical evidence that the higher levels of ownership of assets and higher economic returns to formal, non-agricultural employment have contributed to lower poverty while much work needs to be done to turn education, employment and access to basic services as more effective tools for poverty reduction. We also found that while the levels of socio-economic capital increased in some cases, the corresponding economic returns also declined at approximately the same pace. These offsetting forces lead to small changes in poverty and inequality at the aggregate-level over the past decade.

The results of this study point to the need to ensure that the welfare-improving effect, i.e., the changes in SERs, do not work to the disadvantage of the poor is probably as important as providing access to SECs. There are several ways to do this. In terms of human capital, it is important that socio-economic planners provide enabling opportunities for the poor to get access to skills needed in higher-productivity sectors for the country's poverty reduction to speed up (ADB 2012). At the same time that workers are stockpiling skills, it is also important that economic growth would be used to create high quality jobs continuously so that the economic returns to formal and non-agricultural employment will not deteriorate as the supply of high skilled workers increases. On the other hand, the finding that the returns to basic services dropped faster than the rate at which access to basic services increased, leading to higher poverty, could be attributed to the higher cost that low income households have to pay to access basic services due to the hike in electricity tariffs and expanded value added tax in utilities which started in 2006. Thus, to ensure that the access to basic services will contribute

significantly to reducing poverty, it is important to minimize the cost needed to provide such services. This can be done by investing more on infrastructure that can make the delivery of such services more efficient. However, although there are signs of improvement, the availability of key infrastructure in the country compares unfavourably with that in many of its Southeast Asian neighbours at present (WB, 2014; ADB, 2007).¹¹ Nevertheless, given the high economic growth and higher liquidity in the financial market nowadays, the government can respond to this problem by initiating more infrastructure investment and providing a socio-economic environment that will attract non-government players to play more actively in this role. In terms of access to assets, we find that access to assets increased much faster than the rate at which the returns to asset ownership dropped which in turn, contributed to lower poverty and inequality. For policy-makers, the challenge is to provide an economic environment that will sustain this trend by ensuring that access to productive assets is equitable and knowledge on how to use these assets for income-generation is easily accessible to everyone.

By using the residuals from the estimated models as proxy to socio-economic shocks, this study has also examined the impact of shocks to poverty and inequality. At the national-level, we have found that shocks have smaller impact on poverty gap relative to the contribution of the changes in SECs and SERs between 2003 and 2006. In contrast, the impact of shocks on the change in poverty gap between 2006 and 2009 is comparable with the impact of changes in other factors, particularly the changes in returns to access to basic services and returns to asset ownership. In addition, socio-economic shocks have also contributed to increasing inequality. To some extent, this could mean that the shocks experienced by Filipino households over the past decade had debilitating impact for the poor. To minimize the adverse impact of economic shocks on poor and vulnerable households, social safety nets should be put in place. Often, this is the responsibility of the government. However, some studies suggest that the efforts of the government fall short in this respect. For instance, an ADB report surmised that despite the country being used to environmental disasters, the relief provided during such episodes remains inadequate (ADB 2007). Some studies also suggest that the weak impact of the social protection programs in poverty reduction can be partially explained by the low coverage and limitations in targeting appropriate recipients (Reyes et al. 2011; Bird and Hill 2009; ADB 2007). When formal social safety nets are not working effectively, low income households would often turn to informal risk sharing networks where funds are raised through gifts and loans among members (Fafchamps and Lund, 2003). However, informal risk-sharing is not always optimal for the poor (Fafchamps and Gubert, 2007). In particular, although some loans made through this channel are usually subjected to zero interest rates or do not have to be repaid fully, others expect much higher payments leading the poor to further debts (Platteau, 1997). In

addition, members of a risk-sharing network may have a hard time raising funds if all of them are experiencing income shocks (Landmann, Vollan, Frolich, 2012). Furthermore, the funds raised through this channel may only cover a fraction of the income shocks (Townsend, 1994). Thus, it is important that policy makers examine the effectiveness of both formal and informal social safety nets that exist today.

Overall, the findings of this study highlight that the problem on poverty and inequality cannot be addressed by simply increasing the levels of socio-economic capital of the people living at the bottom of the social hierarchy. Without any intervention, the benefits of higher levels of socio-economic capital may just be washed out by lower economic returns. Thus, socio-economic planners should devise policies that would ensure that economic growth translates to improvement in socio-economic capital and creation of more opportunities where this capital can be used more productively. Throughout this process, the importance of providing access to social safety nets should not be taken for granted. In particular, although the results suggest that economic shocks between 2003 and 2006 did not contribute significantly to the observed changes in poverty gap, it drove US\$2 headcount poverty rate to increase. Between 2006 and 2009, shocks contributed to higher poverty, regardless of the poverty index being used. In addition, economic shocks also contributed to higher income inequality for all periods. Given that the Philippines has a wide range of social safety nets in place (Reyes, Tabuga, Mina, Asis and Datu, 2011; Bird and Hill, 2009 and Ortiz, 2001), the finding that income shocks have pushed (headcount) poverty and inequality up, should prompt socio-economic planners to re-evaluate the effectiveness of existing social protection programs. If left unaddressed, socio-economic shocks may deter the country's economic development.

NOTES

- 1 The ASEAN-5 countries are Indonesia, Malaysia, Philippines, Thailand and Viet Nam.
- 2 In other sociological literature, education is considered as an endowment while employment is considered as a type of functioning (i.e., capacity to translate an endowment to resources that can be used directly to improve one's well-being). In this study, we considered both education and employment as different types of socio-economic capital to account for the fact that people have different capacities to make endowments function towards improving one's living standards.
- 3 There are other forms of socio-economic capital that can influence the household income distribution based on the existing literature. For example, health is directly correlated with productivity which in turn, is directly

correlated with economic well-being (Baker 2004). In addition, social networks can also be used to access essential resources such as education, healthcare and other utilities more easily (Jain and Sonnen 2011; Acock and Hurlbert 1993). However, this study does not include these types of capital are not available from the data.

- 4 Usually, the income variable is expressed in the natural logarithmic form.
- 5 Results for other poverty and inequality indices are provided in the appendix.
- 6 In our preliminary analyses, we also examined the feasibility of principal component technique, one of the most commonly used tools in constructing a socio-economic index (Vyas and Kumaranayake 2006). However, one of the main issues in using PCA for index construction is the chance of getting counterintuitive weights due to its tendency to assign more weight to component indicators that have high variability in the data (McKenzie 2003). For example, suppose all households are grouped into either group A, B, C or D. Based from prior information, all households in A have the highest living standards, followed by B, C and then D. Furthermore, suppose that there are only very few households in A. In this example, PCA would likely assign a very small weight to the dummy variable corresponding to group A. Thus, if a household moves from D to A, the index constructed based from PCA may not be able to capture the significant improvement in the household's living standards because of the small weight assigned to A. Although one could exclude indicators that are not very variable to avoid having a biased index as well as indicators that have very low variability to avoid having an index that would not be useful for differentiating households from one another, such approach could lead to significant loss of information.
- 7 This is related to "panel fatigue" where the likelihood of a panel respondent participating declines with the duration of the study.
- 8 There are three major island groups in the Philippines: Luzon, Visayas and Mindanao. Although the NCR is within Luzon, we separated the two regions due to the distinctive difference of NCR from the rest of Luzon. In the models used to construct the Location index, Mindanao is used as the reference category.
- 9 In this study, formal employment refers to jobs held by government employees, professionals and wage workers employed in private businesses.
- 10 The estimates are provided in the appendix.
- 11 According to the 2013-2014 Global Competitiveness Index compiled by World Economic Forum, the Philippines is ranked 96th out of 148 countries based on the Infrastructure pillar. Its Southeast Asian neighbours rank higher: Malaysia (29th), Thailand (47th) and Indonesia (61st) (WB 2014).

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Appendix Table 1. Descriptive Statistics

SEC Indicators		2003		2006		2009	
		Mean / Proportion	Standard Deviation	Mean / Proportion	Standard Deviation	Mean / Proportion	Standard Deviation
LOCATION	Living in urban areas	0.49	0.5	0.49	0.5	0.49	0.5
	Living in NCR	0.09	0.29	0.09	0.29	0.09	0.29
	Living in Luzon	0.46	0.5	0.46	0.5	0.46	0.5
	Living in Visayas	0.22	0.41	0.22	0.41	0.22	0.41
	Living in Mindanao	0.23	0.42	0.23	0.42	0.23	0.42
EDUCATION	Proportion of working age hhld members who have at most secondary education	0.41	0.35	0.42	0.33	0.43	0.32
	Proportion of working age hhld members who have postsecondary education	0.23	0.32	0.24	0.32	0.25	0.32
EMPLOYMENT	Proportion of employed hhld members working in the non-agriculture sector	0.65	0.43	0.65	0.47	0.69	0.44
	Proportion of employed hhld members with formal employment arrangement	0.27	0.37	0.28	0.37	0.32	0.39
	Proportion of employed hhld members with permanent jobs	0.69	0.4	0.73	0.39	0.74	0.37
SERVICES	Has access to electricity at home	0.78	0.41	0.83	0.38	0.87	0.34
	Has access to water faucet at home	0.44	0.5	0.83	0.5	0.49	0.5
	Has access to water-sealed toilet facility at home	0.72	0.45	0.83	0.43	0.81	0.4
	Has access to .. Toilet facility at home	0.1	0.29	0.83	0.28	0.06	0.24
ASSETS	Owens a house/lot	0.72	0.45	0.83	0.42	0.75	0.43
	Owens a refrigerator	0.37	0.48	0.83	0.49	0.4	0.49
	Owens a phone	0.31	0.46	0.83	0.5	0.71	0.45
	Owens a car	0.12	0.33	0.83	0.39	0.25	0.43

Appendix Table 2. Estimated Contribution of Different Factors on Changes in Poverty and Inequality

	2003-2006										2006-2009										2003-2009									
	PHILIPPINES					PHILIPPINES					PHILIPPINES					PHILIPPINES					PHILIPPINES									
	FGT(0)	FGT(1)	FGT(2)	Gini	Theil	FGT(0)	FGT(1)	FGT(2)	Gini	Theil	FGT(0)	FGT(1)	FGT(2)	Gini	Theil	FGT(0)	FGT(1)	FGT(2)	Gini	Theil										
Location	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00										
Economic returns to location	0.90	0.38	0.19	-0.29	-0.54	0.84	0.39	0.19	-0.29	-0.53	1.81	0.74	0.37	-0.57	-0.96	1.81	0.74	0.37	-0.57	-0.96										
Education	0.04	0.10	0.09	0.27	0.29	-0.26	-0.12	-0.06	0.02	-0.14	0.04	0.10	0.09	0.27	0.29	-0.19	0.00	0.03	0.30	0.21										
Economic returns to education	6.95	3.71	2.16	-0.08	-0.14	-0.49	-0.27	-0.15	0.01	0.01	6.54	3.34	1.88	-0.07	-0.12	6.54	3.34	1.88	-0.07	-0.12										
Type of employment	0.23	0.40	0.30	0.40	0.39	-1.15	-0.50	-0.28	-0.25	-0.51	-0.52	0.00	0.06	0.22	-0.02	-0.52	0.00	0.06	0.22	-0.02										
Economic returns to type of employment	-7.68	-3.61	-1.91	2.02	3.89	0.13	0.07	0.03	-0.04	-0.07	0.13	0.07	0.03	-0.04	-0.07	-8.11	-3.57	-1.85	1.92	3.54										
Access to services	-0.69	-0.47	-0.28	-0.29	-0.71	-0.77	-0.45	-0.26	-0.25	-0.38	-1.64	-1.02	-0.58	-0.59	-1.10	-1.64	-1.02	-0.58	-0.59	-1.10										
Economic returns to access to services	5.82	2.44	1.24	-1.16	-1.94	0.52	0.25	0.13	-0.10	-0.16	6.60	2.69	1.33	-1.21	-1.95	6.60	2.69	1.33	-1.21	-1.95										
Assets held	-5.55	-2.31	-1.12	-0.23	-0.19	-4.45	-2.46	-1.34	-1.34	-2.66	-10.03	-4.65	-2.38	-1.48	-2.80	-10.03	-4.65	-2.38	-1.48	-2.80										
Economic returns to assets	0.80	0.27	0.12	-0.90	-1.53	0.56	0.22	0.10	-0.45	-0.74	1.47	0.50	0.22	-1.31	-2.13	1.47	0.50	0.22	-1.31	-2.13										
Unobserved factors	2.21	-0.03	-0.42	1.71	2.18	0.71	0.29	0.04	0.56	1.96	2.75	0.26	-0.33	2.11	3.83	2.75	0.26	-0.33	2.11	3.83										
Total change	3.03	0.88	0.35	1.44	1.69	-4.36	-2.59	-1.60	-2.13	-3.20	-1.32	-1.71	-1.24	-0.68	-1.51	-1.32	-1.71	-1.24	-0.68	-1.51										

Appendix Tables: Estimated Contribution of Different Factors on Changes in Poverty and Inequality, by Region]

		2003-2006						2006-2009						2003-2009							
		NCR						NCR						NCR							
		FGT(0)	FGT(1)	FGT(2)	Gini	Theil	FGT(0)	FGT(1)	FGT(2)	Gini	Theil	FGT(0)	FGT(1)	FGT(2)	Gini	Theil	FGT(0)	FGT(1)	FGT(2)	Gini	Theil
Location		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Economic returns to location		1.61	0.32	0.10	0.00	0.00	1.37	0.38	0.12	0.00	0.00	1.37	0.38	0.12	0.00	0.00	2.44	0.59	0.19	0.00	0.00
Education		0.40	-0.06	-0.03	-0.22	-0.34	-0.15	0.02	0.00	0.08	-0.43	-0.15	0.02	0.00	0.08	-0.43	0.39	0.06	0.00	-0.01	-0.61
Economic returns to education		4.34	0.93	0.29	-0.07	-0.09	-0.42	-0.08	-0.02	0.00	0.01	-0.42	-0.08	-0.02	0.00	0.01	3.41	0.80	0.26	-0.06	-0.08
Type of employment		0.08	0.04	0.00	-0.17	-0.38	-1.05	-0.16	-0.03	-0.78	-1.57	-1.05	-0.16	-0.03	-0.78	-1.57	-0.52	-0.13	-0.04	-0.39	-0.79
Economic returns to type of employment		-5.16	-1.19	-0.36	1.63	2.20	0.09	0.03	0.01	-0.03	-0.04	0.09	0.03	0.01	-0.03	-0.04	-5.39	-1.10	-0.34	1.44	1.74
Access to services		-0.08	-0.01	0.01	-0.02	-0.11	-0.51	-0.14	-0.06	-0.18	-0.26	-0.51	-0.14	-0.06	-0.18	-0.26	-0.49	-0.15	-0.05	-0.19	-0.34
Economic returns to access to services		4.39	0.93	0.29	-0.25	-0.33	0.47	0.11	0.03	-0.02	-0.02	0.47	0.11	0.03	-0.02	-0.02	4.25	0.99	0.32	-0.22	-0.26
Assets held		-1.35	-0.44	-0.15	-0.30	-1.14	-4.30	-0.67	-0.17	-1.40	-2.27	-4.30	-0.67	-0.17	-1.40	-2.27	-4.21	-0.92	-0.29	-1.38	-2.80
Economic returns to assets		0.55	0.10	0.03	-0.71	-1.00	0.25	0.07	0.02	-0.34	-0.47	0.25	0.07	0.02	-0.34	-0.47	0.80	0.15	0.05	-1.00	-1.34
Unobserved factors		0.84	0.05	-0.03	5.77	10.56	-1.00	-0.05	0.01	-1.48	-3.60	-1.00	-0.05	0.01	-1.48	-3.60	-0.29	-0.15	-0.06	3.34	5.19
Total change		5.64	0.66	0.15	5.66	9.36	-5.25	-0.50	-0.10	-4.13	-8.64	-5.25	-0.50	-0.10	-4.13	-8.64	0.39	0.15	0.05	1.53	0.71

Appendix Tables: Estimated Contribution of Different Factors on Changes in Poverty and Inequality, by Region

	2003-2006						2006-2009						2003-2009					
	LUZON						LUZON						LUZON					
	FGT (0)	FGT (1)	FGT (2)	Gini	Theil		FGT (0)	FGT (1)	FGT (2)	Gini	Theil		FGT (0)	FGT (1)	FGT (2)	Gini	Theil	
Location	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	
Economic returns to location	1.20	0.53	0.27	-0.10	-0.15		1.18	0.53	0.27	-0.11	-0.19		2.57	1.04	0.51	-0.21	-0.30	
Education	0.12	0.13	0.09	0.29	0.21		-0.30	-0.09	-0.04	0.07	0.00		-0.13	0.03	0.04	0.34	0.15	
Economic returns to education	7.36	3.25	1.67	-0.07	-0.13		-0.53	-0.23	-0.12	0.01	0.01		6.83	2.90	1.46	-0.07	-0.12	
Type of employment	0.21	0.30	0.20	0.37	0.40		-1.36	-0.48	-0.22	-0.12	-0.33		-0.77	-0.06	0.02	0.17	-0.18	
Economic returns to type of employment	-7.94	-3.21	-1.55	1.77	3.66		0.13	0.06	0.03	-0.03	-0.06		-8.55	-3.22	-1.51	1.70	3.25	
Access to services	-0.67	-0.31	-0.17	-0.22	-0.73		-0.78	-0.44	-0.25	-0.24	-0.36		-1.65	-0.89	-0.48	-0.54	-1.11	
Economic returns to access to services	6.24	2.28	1.04	-0.94	-1.48		0.51	0.23	0.11	-0.08	-0.12		7.03	2.53	1.15	-0.97	-1.47	
Assets held	-6.24	-2.28	-1.02	-0.22	1.03		-4.48	-2.03	-0.99	-1.10	-1.94		-10.94	-4.24	-1.95	-1.41	-1.50	
Economic returns to assets	0.79	0.25	0.10	-0.87	-1.32		0.58	0.20	0.08	-0.43	-0.65		1.52	0.44	0.18	-1.28	-1.82	
Unobserved factors	1.85	0.15	-0.09	0.99	-2.67		1.18	0.43	0.10	0.02	0.06		3.12	0.73	0.09	1.22	-1.68	
Total change	2.92	1.09	0.56	1.00	-1.18		-3.88	-1.82	-1.03	-2.03	-3.58		-0.96	-0.73	-0.48	-1.03	-4.76	

Appendix Tables: Estimated Contribution of Different Factors on Changes in Poverty and Inequality, by Region

	2003-2006										2006-2009										2003-2009									
	VISAYAS					VISAYAS					VISAYAS					VISAYAS					VISAYAS									
	FGT(0)	FGT(1)	FGT(2)	Gini	Theil	FGT(0)	FGT(1)	FGT(2)	Gini	Theil	FGT(0)	FGT(1)	FGT(2)	Gini	Theil	FGT(0)	FGT(1)	FGT(2)	Gini	Theil										
Location	0.00	0.00	0.00	0.00	0.00						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00										
Economic returns to location	0.64	0.33	0.19	-0.13	-0.17	0.57	0.34	0.19	-0.13	-0.20	Economic returns to location	0.34	0.19	-0.13	-0.20	Economic returns to location	0.67	0.37	-0.25	-0.37										
Education	-0.12	0.15	0.15	0.60	0.78	-0.30	-0.20	-0.11	0.12	0.07	Education	-0.20	-0.11	0.12	0.07	Education	-0.36	-0.01	0.03	0.68										
Economic returns to education	7.32	4.52	2.80	-0.08	-0.13	-0.49	-0.33	-0.20	0.01	0.01	Economic returns to education	-0.33	-0.20	0.01	0.01	Economic returns to education	7.38	4.14	-0.07	-0.13										
Type of employment	0.01	0.50	0.40	0.68	0.62	-0.86	-0.67	-0.39	-0.37	-0.68	Type of employment	-0.67	-0.39	-0.37	-0.68	Type of employment	-0.41	0.04	0.35	-0.09										
Economic returns to type of employment	-8.69	-4.56	-2.56	2.14	3.60	0.14	0.08	0.04	-0.04	-0.07	Economic returns to type of employment	0.08	0.04	-0.04	-0.07	Economic returns to type of employment	-9.05	-4.58	-2.48	3.41										
Access to services	-0.87	-0.68	-0.43	-0.53	-0.88	-0.97	-0.59	-0.33	-0.29	-0.42	Access to services	-0.59	-0.33	-0.29	-0.42	Access to services	-2.09	-1.39	-0.81	-1.32										
Economic returns to access to services	5.90	2.86	1.54	-1.39	-2.10	0.57	0.30	0.16	-0.11	-0.17	Economic returns to access to services	0.30	0.16	-0.11	-0.17	Economic returns to access to services	7.04	3.21	-1.42	-2.14										
Assets held	-5.45	-2.50	-1.32	0.64	0.07	-4.31	-3.11	-1.80	-1.36	-2.12	Assets held	-3.11	-1.80	-1.36	-2.12	Assets held	-10.23	-5.61	-3.03	-1.58										
Economic returns to assets	0.84	0.30	0.14	-0.97	-1.61	0.62	0.26	0.12	-0.50	-0.82	Economic returns to assets	0.26	0.12	-0.50	-0.82	Economic returns to assets	1.49	0.60	0.28	-2.37										
Unobserved factors	2.12	0.01	-0.35	0.29	2.86	1.49	0.05	-0.29	2.09	5.56	Unobserved factors	0.05	-0.29	2.09	5.56	Unobserved factors	3.06	0.10	-0.55	7.78										
Total change	1.70	0.94	0.56	1.25	3.06	-3.55	-3.87	-2.61	-0.59	1.15	Total change	-3.55	-3.87	-2.61	-0.59	Total change	-1.85	-2.93	-2.05	0.66										

Appendix Tables: Estimated Contribution of Different Factors on Changes in Poverty and Inequality, by Region]

		2003-2006						2006-2009						2003-2009					
		MINDANAO						MINDANAO						MINDANAO					
		FGT(0)	FGT(1)	FGT(2)	Gini	Theil		FGT(0)	FGT(1)	FGT(2)	Gini	Theil		FGT(0)	FGT(1)	FGT(2)	Gini	Theil	
Location		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	
Economic returns to location		0.24	0.13	0.07	-0.14	-0.20		0.21	0.13	0.07	-0.13	-0.21		0.47	0.25	0.14	-0.27	-0.43	
Education		-0.11	0.05	0.09	0.56	0.82		-0.17	-0.18	-0.10	-0.12	-0.21		-0.40	-0.09	0.01	0.45	0.62	
Economic returns to education		6.82	5.03	3.32	-0.08	-0.13		-0.45	-0.37	-0.24	0.01	0.01		6.45	4.54	2.88	-0.08	-0.12	
Type of employment		0.53	0.64	0.51	0.59	0.61		-1.05	-0.50	-0.38	-0.07	0.69		-0.12	0.21	0.20	0.49	1.06	
Economic returns to type of employment		-7.24	-4.50	-2.68	2.48	3.58		0.15	0.08	0.05	-0.05	-0.08		-7.44	-4.35	-2.55	2.35	3.80	
Access to services		-0.81	-0.78	-0.50	-0.40	-0.62		-0.69	-0.45	-0.30	-0.23	-0.38		-1.67	-1.28	-0.79	-0.62	-1.01	
Economic returns to access to services		5.48	3.00	1.75	-1.66	-2.37		0.54	0.31	0.18	-0.15	-0.21		6.26	3.24	1.82	-1.76	-2.54	
Assets held		-5.98	-2.96	-1.55	0.20	-0.69		-4.59	-3.46	-2.11	-1.05	-2.51		-10.41	-6.11	-3.52	-0.92	-3.18	
Economic returns to assets		0.90	0.35	0.17	-1.04	-1.58		0.61	0.30	0.15	-0.53	-0.78		1.61	0.66	0.33	-1.51	-2.37	
Unobserved factors		3.62	-0.49	-1.34	-0.46	0.75		-0.29	0.36	0.27	2.01	8.64		2.96	-0.39	-1.07	1.62	9.34	
Total change		3.44	0.48	-0.16	0.06	0.19		-5.73	-3.78	-2.40	-0.31	4.98		-2.28	-3.30	-2.56	-0.25	5.16	