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Working Paper

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UPSE Discussion Paper, No. 2007,06

Provided in Cooperation with:

University of the Philippines School of Economics (UPSE)

Suggested Citation: Capistrano, Loradel O.; Santa Maria, Maria Lourdes C. (2007) : The impact of international labor migration and OFW remittances on poverty in the Philippines, UPSE Discussion Paper, No. 2007,06, University of the Philippines, School of Economics (UPSE), Quezon City

This Version is available at:

<https://hdl.handle.net/10419/46665>

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The Impact of International Labor Migration and OFW Remittances on Poverty in the Philippines

by

*Loradel O. Capistrano and Maria Lourdes C. Sta. Maria**

Abstract

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The implications of labor migration and remittances on poverty are becoming a global issue. The Philippines is considered as one of the largest labor-sending countries in the world. There are numerous studies on remittances and migration and how they contribute to poverty reduction. However, the studies particularly done for the Philippines are quite scarce. There are still certain aspects that have not yet been explored. In this paper, we aim to enhance the current and previous studies by examining the impact of migration on poverty using a different theoretical and empirical framework. We also intend to analyze the sole effect of migration on poverty in the Philippines and to utilize three measures of poverty to determine the effects of migration and remittances on the different levels of poverty. Finally, in this study, we only consider the role of Overseas Filipino Workers (OFW). Thus, we use the data on labor migration and remittances on OFWs alone. This paper investigates the impact of labor migration and overseas workers' remittances on poverty reduction in the Philippines using a panel data on the 16 regions in the years 1997, 2000 and 2003. The study identifies and quantifies the individual poverty alleviating effects of the level of labor migration and volume of remittances on the three Foster-Greer-Thorbecke poverty indices – the incidence, depth and severity of poverty in the Philippines. The findings suggest that labor migration and remittance flows exert a negative and significant impact on all three measures of poverty. A 10% increase in per capita remittance and number of labor migrants leads to an approximately 0.4% and 0.2% reduction, respectively, in the proportion of families living below the poverty line.

The Impact of International Labor Migration and OFW Remittances on Poverty in the Philippines

By

Loradel O.Capistrano and Maria Lourdes C. Sta. Maria

1. Introduction

The past decades have been characterized by massive international migration. Global migration has been receiving mounting interest from governments, academics and the media for the fact that this phenomenon is depicting a continuous growth and an increasing trend. International migration involves movement of people from one country to another. Most people leave to find stability. Some work abroad to improve the standards of living of their families and themselves. These labor movements are accompanied by considerable amount of remittances to the home countries. These remittance inflows are revealing even great surges in developing countries. In 2004, the World Bank Global Development Finance reports a \$204.5 billion of global remittances which has grown by 57% since the year 2001. The largest portion of global transfers (70%) is sent to the developing countries. These have been the largest source of external finance for most developing countries outpacing foreign direct investment (FDI) and other private capital flows. Ratha [2004] notes that from \$88.1 billion in 2002, worker's remittances increased to an estimated amount of \$93 billion in 2003. As a matter of fact, in 2002, remittances remain to be larger than both official and private flows in 36 developing countries.

The considerable inflow of remittances to a labor-exporting country has been playing a very vital role in most economies. Cattaneo [2005] writes that the volume of remittances, aside from the fact that they benefit the recipient-households, has certain macro-economic impacts, particularly, on development indicators. International migration and remittances, therefore, can constitute a visible mechanism for reshaping the country of origin.

The issues on international labor migration, remittances and welfare continue to obscure different ideas on development around the world especially for the developing countries. Empirical literature on how remittance transfers aid in poverty reduction is rather mixed. On the negative side, Stahl [1982], as cited in Jongwanich [2007], argues that the poor does not benefit from migration since only the richer households gain considerable access to migration opportunities. However, more recent studies employing cross-country regressions like Adams and Page [2005], World Bank [2006] and Jongwanich [2007] find that remittances contribute to the alleviation of poverty.

This paper tries to examine the relationship between migration and poverty through a country-specific case study, using a panel data in the Philippines. Specifically, the paper attempts to enrich the literature through the provision of four major innovations. First, the

study examines the impact of migration on poverty using a different theoretical and empirical framework which is presented in the succeeding sections. Second, so far, in the Philippine literature, there has been no research study that considers the effect of labor migration alone on poverty. All the existing literature primarily deals on the role of remittances on poverty reduction. In this study, we introduce a separate variable for the level of labor migration. Third, the study utilizes not one, but three measures of poverty- the level, depth and severity of poverty, to capture the effects of migration and remittances on the different levels of poverty. Finally, the study aims to consider only the role of overseas Filipino workers who are now being hailed as national heroes. In view of this, the data on labor migration and remittances are limited to the Overseas Filipino Workers (OFWs).

Generally, our study aims to explore the migration-poverty and remittance-poverty nexuses. Basically, our paper intends to address three main research objectives: (1) To investigate how OFW remittances and international labor migration affect the level, depth and severity of poverty in the Philippines (2) To quantify the magnitude of the individual poverty effects of the volume of remittances and level of labor migration and (3) To test the significance of labor migration and remittances in poverty reduction. To address these objectives, this paper looks at a cross-section of 16 Philippine regions in the years 1997, 2000 and 2003 as our data set.

The remainder of this paper is structured as follows: Chapter 2 presents an overview of the trends in labor migration and remittances in the Philippines. Chapter 3 discusses the previous literature regarding the effects of migration and remittances on development and specifically, on poverty. Chapter 4 presents the theoretical foundation that supports the empirical framework of the study. Chapter 5 outlines the econometric model used, the definition of the variables, and the description of the data set and the econometric procedure employed. Chapter 6 presents the results and analysis. Chapter 7 summarizes the findings and provides several policy recommendations.

2. Background of the Study

This chapter presents an overview of Philippine labor migration and remittance patterns. The first section discusses the historical waves of deployment of Filipino migration. The succeeding sections describe the scale, direction and structure of current labor migration and remittances.

2.1 History of Labor Migration

It is a known fact that poverty is one of the serious problems facing the Philippines today. In view of this, there is a challenge for a country especially for a developing country to alleviate poverty. The Philippine government is constantly seeking ways to improve the plight of poor families. Unsolved problems in the country namely poverty, high unemployment rate and limited opportunities have pushed most Filipinos to choose to work abroad. Filipinos have this perception that overseas, there are a lot of opportunities that will

not only improve their standards of living but will also provide them a better job and quality education. In addition, Filipinos seem to seek social and economic development overseas. These perceptions have encouraged migration and as a result, millions of Filipinos are swayed not only to work but also to permanently stay abroad. Although, local migration creates remittances, still what offers significantly greater amount of inflows is international labor migration.

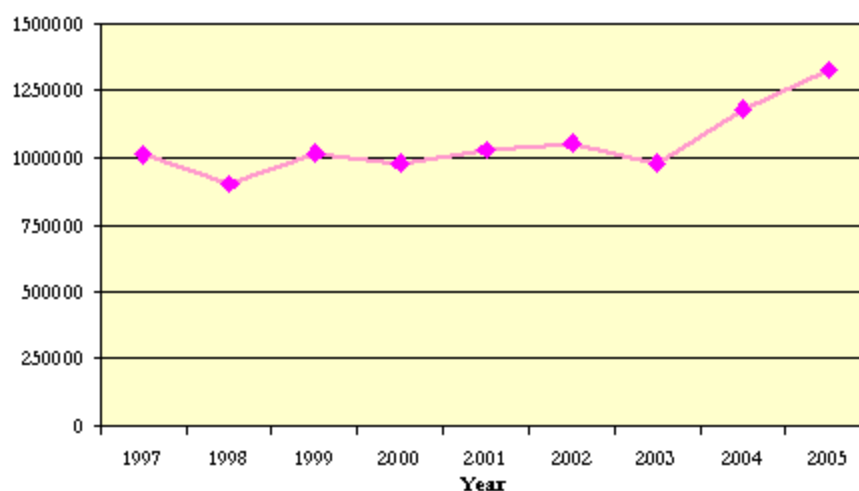
As early as the 1900s, there was already a trace of evidence with regards to movements toward permanent migration. The Philippines back then was known for its cheap labor. When Hawaii experienced tremendous deficiency in terms of plantation laborers, it opened the market for overseas Filipino workers. During the 1930s, Filipinos became California's fruit-picking workers and Hawaii's plantation workers. After World War II, the second wave of contract migration emerged. Filipinos were contracted to take part in the reconstruction of American bases in several countries. Workforce markets opened in different Asian countries including Borneo, Thailand, Malaysia and Indonesia. After four decades, the migration trend reached the Middle East. Due to increased oil prices, oil-producing countries experienced an enormous development boom which resulted to increased demand for skilled labor. During the 1980s, Newly Industrialized Countries (NICs) from Asia surfaced. Countries which were members of NIC provided Filipinos with trainership programs to be able to satisfy the demand for workers in their labor markets. From 3,694 workers sent out to work overseas in 1969, overseas Filipino workers increased dramatically and totaled 661,997 in 1990 (NSO 2000).

2.2 Scale, Direction and Structure of Labor Migration

There are two types of worker outflow on overseas employment. One is permanent migration, in which, workers stay overseas for an uncertain span of time. The other one is called contract or temporary migration, in which there is a specified period of time for a worker to stay abroad (NSO 2000).

Massive labor migration is now becoming a trend in the Philippines. The Philippines is one of the world's major exporters of labor. As of 2005, there are about 1.3 million Overseas Filipino Workers worldwide according to the National Statistics Office (NSO) Survey on Overseas Filipino Workers (SOF). This 2005 estimate is 12.5 percent more than the 1.18 million OFWs estimated for the period April to September 2004. From 1997, the number of OFWs has vastly increased by 30% as shown in Figure 1.

Figure 1. Number of OFWs 1997-2005



Source of Data: National Statistics Office, *Survey on Overseas Filipino Workers*, various years.

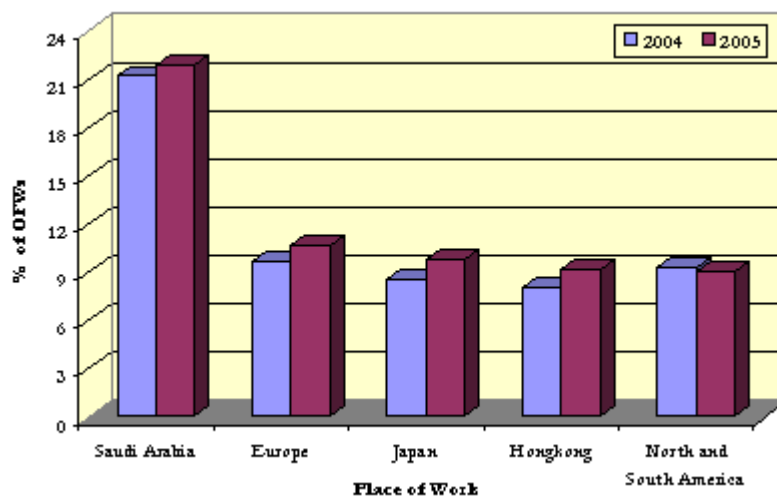
From these 1.3 million overseas workers in 2005, 23.5 % are aged 25 to 29 years old. The 2005 estimate also reveals that 50.3 percent or about 667 thousand were male workers while 49.7 percent or about 660 thousand were females. The survey also shows that the majority of the OFWs are laborers and unskilled workers (33.1%), plant and machine operators and assemblers (14.5%) and trades and related workers (14.5%) (see Table 1).

Table 1. Occupational Structure of OFWs: 2005

Major Occupation	%
Officials of Government	2.4
Professionals	8.8
Technicians and Associate Professionals	8.1
Clerks	4.5
Service Workers and Shop and Market Sales Workers	13.7
Farmers, Forestry Workers and Fishermen	0.2
Trades and Related Workers	14.5
Plant and Machine Operators and Assemblers	14.5
Laborers and Unskilled Workers	33.1
Special Occupations	0.2

Source of Data: National Statistics Office, *Survey on Overseas Filipino Workers*, various years.

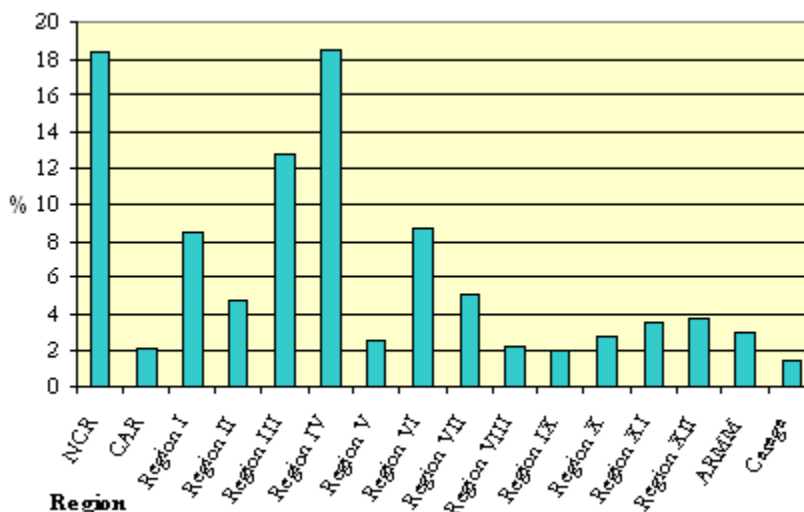
Figure 2. Top Labor Destinations of OFWs: 2004 and 2005



Source of Data: National Statistics Office, *Survey on Overseas Filipino Workers*, various years.

The top labor destinations in 2004 and 2005, as seen in Figure 2, are Saudi Arabia, Europe, Japan, Hong Kong and the North and South America. During the two-year period, it is noticeable that Saudi Arabia is the topmost OFW destination. This migration pattern could be explained by the geographical proximity of Saudi Arabia to the Philippines. This is also supported by the migration figures by continent which showed that almost 77% of the total OFWs can be found in Asia. However, other factors can also explain this trend, aside from geographical proximity alone. In 2005, the top 3 labor-sending Philippine regions are National Capital Region (18.4%), Southern Tagalog (17.1%), and Central Luzon (12.8%) (see Figure 3). Therefore, it can easily be inferred that those people in or nearby urban areas have more access to migration opportunities than those in the provinces.

Figure 3. Percentage Distribution of OFWs: 2005



Source: National Statistics Office, *Survey on Overseas Filipino Workers*, various years.

2.3 Recent Trends in Remittances

In 2005, the International Monetary Fund (IMF) comes up with the top recipients of remittances to developing countries. The Philippines ranks as the third largest remittance-recipient amounting to \$4.9 billion, following India (\$6.91 billion) and Mexico (\$6.37 billion) in the first and second place respectively.

According to the NSO Survey on Overseas Filipinos, during the period April to September 2005, total remittances are estimated at 85.4 billion pesos, which is 6.2 billion pesos greater than the 2004 estimate of 79.3 billion pesos. Seventy percent of these 85.4 billion pesos are cash sent, 25.1% is cash brought home and 4.6% are remittances in kind. However, only 75.8% is transferred through banks, the remaining 24.2% is sent through door-to-door delivery and is remitted through agency, friends/co-workers and other means. In Asia alone, an estimated amount of 39.9 billion pesos are cash remittances sent to the Philippines.

As expected, parallel to the increase in the number of Filipinos migrating to other countries, OFW remittances pouring to the Philippine economy also grew. This has been setting the Philippines apart from its Asian neighbors. Apart from the revenues from trade in goods and services, these transfers are increasingly becoming the largest source of foreign exchange in the Philippines, outpacing FDI and ODA. In 2004, remittances amount to US\$ 11.6 billion while FDI is about US\$ 463 million and ODA is US\$ 462.8 billion.

However, there is still a problem with regards to gauging the true value of these remittances. The reason for this is because remittances take many forms and pass through many channels, so it is really difficult to assess their value. Official remittances are sometimes not a reliable measure. The total value of remittances is usually underestimated since most remittances are sent through the unofficial means (Connell and Brown, 2005).

3. Review of Related Literature

This chapter which is based on extensive literature contributions primarily describes the implications of migration and remittances on the economy and society both on a theoretical and empirical framework. In the literature that we have surveyed, two contrasting views regarding the effects of labor migration and remittances on the economy of the labor-sending country are presented: the optimistic view and the pessimistic view. The first one views labor migration and remittances as mechanisms for economic development while the latter, on the other hand, perceives migration and its accompanying remittances as an “illness” that weakens the economy (Cattaneo 2005). This chapter takes into account these two opposing perspectives by presenting various literature that support them.

This chapter is divided into two major parts. The first part reviews the implications of labor movement and remittances, substantiating the optimistic and pessimistic viewpoints, whereas the second portion is devoted to present the literature that concentrates on the poverty alleviating effects of labor mobility and remittances which is the focus of this study.

3.1 Impact of Migration and Remittances on Development

The beneficial and detrimental effects of migration and overseas remittances can be classified using three perspectives: at the household level, at the community or local level and at the macro or national level. The succeeding sections highlight these three perspectives.

Household Level

The effects of remittances on the recipient families are clear-cut. A huge portion of migrant workers' income is mainly being remitted to their families in their home countries thereby increasing the family incomes. These remittances directly become part of the household budget which the families can spend on basic needs and serve as extra funds either for increasing consumption of both durable and non-durable goods or for savings. Remittances may also serve as capital for starting businesses. Thus, it can be seen that these overseas cash flows generally raise the immediate standard of living of their recipient families. However, it should be noted that this will only hold true for all households if families are able to spend on wise expenditures. Therefore, the benefits that will be derived from these remittances will depend on how and where the families spend them.

Various studies empirically prove that remittances indeed lifted the level of children's education of the recipient families. In Mexico, Lopez-Cordova [2004] finds that as the fraction of remittance-receiving households increases, child illiteracy and child school attendance among children aged 6-14 years old improves. However, McKenzie [1997] finds that migration lowered educational attainment of children which he attributes to the parental absence arising from current migration.

Aside from affecting educational outcomes, migration and remittances are also found to positively affect health status of recipient families. Education and health are two factors that augment human capital development. In Mexico, Hildebrandt and McKenzie [2005] find that Mexico-US migration improves child health outcomes-lower infant mortality rates and higher birth weights. The study identifies two channels of the effect: one is the health improvements brought about by increases in income and another is the finding that having a migrant family member is associated with increase in the level of health knowledge among the mothers.

Although labor migration and remittances indeed provide households with considerable benefits, there are also substantial economic and social costs associated with it. On the economic side, unfortunately, migration may generate dependency behavior at the household level (Meins 2007). Overseas remittances as pointed out by Bridi [2005] do promote

idleness on the part of the recipients. Chami and others [2005] argues that migration may create a moral hazard problem. It induces disincentives to work among migrant household members. On the social side, Rodriguez [2003] writes that migration has unfavorable effects on the sender's family in the form of broken families, fatherless children and other problems as a result of parental absence. Furthermore, remittances can also cause family tensions within households with migrants.

Community Level

Although remittances accrue directly to households with migrant members, families that do not receive remittances can also benefit indirectly from these transfers, thus, promoting local development. Spillover mechanisms are operating. The subsequent paragraphs discuss various ways by which non-migrant households indirectly gain from migration, specifically, from remittances.

First, increased consumption of migrant households can generate multiplier effects.¹ If recipient families increase their household consumption on local goods and services, this will benefit other members of the community through the increase in demand which stimulates local production, thereby promoting job creation and local development.

Second, remittances are also found to prop up formation of small-scale enterprises, thereby, promoting local development. Workers' remittances ease credit constraints and as mentioned earlier provide working capital for the recipients to engage in entrepreneurial activities. This results to job creation and enhance the development of the remittance-receiving locality. Woodruff and Zenteno [2001], utilizing survey data for 12,005 microenterprises owned by 11,823 individuals in 44 urban areas in Mexico, find a large positive impact of remittances on microenterprise development in Mexico.

Lastly, aside from enterprise investments, remittances may also contribute to the creation of new social assets and services and community physical infrastructures such as schools, health centers, roads and other community projects. This is where the role of migrant associations comes in. These associations usually pool their resources and send them to their home communities (Ghosh 2006). According to Sorensen and Pedersen [2002], they may serve as platforms that bring significant development in the communities which benefit both migrant and non-migrant families.

At the community level, remittances are found to affect the distribution of income. Ravanilla and Robleza [2003] apply decomposition analysis to investigate the contribution of remittances to total income inequality in the Philippines. The findings suggest that

¹ Multiplier effects are also generated in the macroeconomy.

remittances tend to increase income inequality and the effect is greater for the rural than the urban areas.

Macro Level

One of the most significant benefits of the influx of remittances to a country is the fact that these increase the foreign exchange earnings of the labor exporting country. The foreign exchange enhancing effect of these inflows has been very significant in many countries, especially developing countries, which are experiencing fiscal deficits, external debts, continuing trade imbalances and limited foreign direct investment (Pernia 2006). According to Ratha [2003], remittance inflows have become the least volatile and growing source of foreign exchange for developing economies. In addition, workers' remittances exert a positive impact on the Balance of Payments² of a certain country. In the 1990's, the Philippines experienced a sharp rise in the current account deficit and this threatened the country with a balance of payment crisis. Opiniano [2004] claim that the BOP crisis is halted through the joint effect of the OFW remittances along with the investment inflows and medium to long-term loans.

Aside from their contribution on the foreign earnings and valuable support to the BOP, remittances also promote economic growth, through their effects on certain macroeconomic variables according to various studies. A variety of literature has identified two main channels by which remittances affect the recipient country's growth: direct effects through savings and investment and indirect effects through consumption. Cattaneo [2005] notes that remittances are typically spent on investments in physical assets as well as investments in human capital such as education and health, which stimulate growth. The second main channel through which remittances may affect growth is consumption. In fact, remittances may stimulate the economy through the consumption multiplier and create indirect effects which may not only benefit the sender's family but also do extend to non-migrants as well (Cattaneo 2005).

Although labor migration and overseas remittances truly benefit the labor-sending country, there are issues such as brain drain, Dutch disease and national dependence on labor export that need to be tackled. The issues mentioned above are the negative impacts of labor migration and overseas remittances. Some authors argue that migration leads to a loss of highly skilled individuals in the home country, an occurrence known as the brain drain. Adams [2003], in a study of 24 labor-exporting countries, finds that international migration involves the outflow of the well-educated people and that for several labor-exporting countries, international migration does cause brain drain. Aside from the loss of well-educated

² Balance of Payments is the record of the transactions of the residents of a country with the rest of the world. There are two main accounts in the BOP: the current account which records trade in goods and services as well as transfer payments and the capital account which contains purchases and sales of assets (Dornbusch *et al.* 2003).

and skilled workers, brain drain can also imply a significant loss in terms of tax contributions (IOM 2006).³

There are also discussions about how labor migration and remittances cause severe changes in exchange rates, increased demand for local currency and how they affect exports and external competitiveness of the labor-sending country. This phenomenon is known as the Dutch disease (Meins 2007). In a case study in Cape Verde, Bourdet and Falck [2003], finds that, in general, capital inflows in the form of remittances give rise to a phenomenon known as the Dutch Disease effect and thus result to a decline in the competitiveness of the in the world export market.

3.2. Impact of Migration and Remittances on Poverty

This section is exclusively devoted to provide a review of the existing body of research that deal on the role of migration and remittances on poverty alleviation in the sending country. The literature on this is not that vast. This can be attributed to data limitations on poverty as well as data on international migration and remittances. In this section, we present the evidences exemplified by these studies. Furthermore, this section is divided into two key areas- the foreign literature and the Philippine literature.

Foreign Studies

The foreign literature presented here is further classified based on the sample utilized by the studies to investigate the relationship between international migration and poverty. The section is classified into cross-country studies and country-specific studies.

Cross-Country Studies

Two scholars who first attempted to explore the relationship between migration and poverty through cross country estimations are Adams and Page. Adams and Page [2003] do a cross-section analysis of 74 developing countries. They estimate three poverty measures- poverty headcount, depth of poverty and severity of poverty, as a function of three variables- income measured by GDP per capita, income distribution measured by the Gini coefficient and level of international migration or official remittances per country. Using this framework, they find that both international migration and remittances exert a strong, negative impact in reducing the level, depth and severity of poverty. In a more recent paper, Adams and Page [2005] repeat the same study to 71 developing countries. As a result, the study finds that a 10% increase in international migration or remittances leads to a 2.1% and 3.5%, respectively, decline in the share of people living in poverty.

In a poverty simulation model that relates the change in poverty to income growth and inequality change for 81 countries, a five percentage point average increase in the

³ International Organization for Migration

headcount ratio for lower-remittance countries and more than twice of that for higher-remittance countries are found to result when the impact of remittances on poverty rate is eliminated (World Bank 2006).

There are also various cross-country studies that focus on specific regions of the world, more specifically, to the developing regions of the world. According to the IMF [2006], the Asia and the Pacific experience a major increase in remittance flows and currently accounts for the largest share in total remittances followed by the Latin America and Africa. These regions of the world receive considerable attention in the literature. Acosta and others [2007] conduct a cross-country analysis to explore how remittances are contributing to poverty in the Latin America and the Caribbean. The study uses a different econometric approach which allows them to estimate the separate effects of remittances on two determinants of poverty: the average income growth and the degree of income inequality. The results suggest that remittances exert a positive and significant effect on income growth and cause a slight reduction in inequality. Combining these results, they concluded that overall, a one percentage point increase in remittance to GDP ratio reduces the poverty incidence in Latin America by about 0.4%. In a similar vein, Jongwanich [2007] accomplishes a recent study in Asia Pacific. He estimates the impact of remittances on poverty by decomposing its effect into direct and indirect components. Using a panel data set of Asia Pacific countries during the periods 1993-2003, he finds that remittances directly reduce poverty through augmenting family incomes. The indirect impact on poverty reduction is seen through the growth and human capital effects of remittances. He further concludes that “remittances can generate income even for families who receive no remittances at all mainly through the multiplier effects of expanded spending and such multiplier effect can lead to poverty reduction even some poor families do not directly get remittance inflows.”

The results suggested by the above studies depict the vital role of remittances in alleviating poverty. However, there are few studies which present the contrasting view. These studies show that migration and remittances do not benefit the plight of the poor people. In particular, Stahl [1982], as cited in Jongwanich [2007], argues that “because the international migration can be an expensive venture, it is going to be the better-off households who will be more capable of producing migration and sending remittances. While poor households would not get the benefit from such remittance flows, they tend to generate inequality so that poverty tends to eventually increase.” Likewise, Cattaneo [2005] finds empirical evidence which is contrary to what the previous studies have proven. She uses a data set from 149 labor-sending countries. The study estimates the average income of the poor as a function of the country average income, income inequality, level of migration and remittances and other local factors. The study finds that remittances do not have any impact on poverty while the stock of migrants per capita shows a strong dampening effect on poverty.

The employment of cross-country regressions in investigating the effects of migration or remittances on poverty alleviation may be subjected to one major drawback. That is, the fact that countries may differ in their concepts, definitions and measurements of the variables that are used in the estimation. Hence, in order to get more reliable results, there is a need to

carry out country-specific studies in which the above pitfall described can be overcome. The subsequent subsection presents the strands of literature which explore the migration-poverty interaction through micro level studies in various countries.

Country-Specific Studies

In this section, we present micro level studies obtained from the survey of literature that has been carried out. These country-specific studies utilize different empirical approaches in their quest to generate the impact of international migration on poverty alleviation. These include studies done in Latin American countries such as Guatemala and Mexico which are among the largest labor exporters in the world and Sub-Saharan African countries like Ghana where poverty rates are highest.

The Latin American region is one of the largest exporter of labor and recipient of remittances in the world. A variety of studies are done to investigate the poverty alleviating effects of remittances in specific Latin American countries. Adams [2004] studies the remittance-poverty interaction in Guatemala using a different framework. Using a large, nationally representative household survey consisting of 7,276 household respondents and predicted income functions, he compares the poverty headcount, poverty gap, and squared poverty gap of Guatemalan households that receive internal and/or international transfers with those of households that do not receive any remittance income. Findings reveal that both types of remittances decrease poverty creating a quantitatively larger effect on the severity of poverty, as measured by the squared poverty gap, rather than on the proportion of people living in poverty. Remittances, when included in expenditure, reduce poverty by 21.1% or 19.8 % respectively. This greater poverty-assuaging effect exerted is attributed to the kinds of income/expenditure groups receiving remittances. Adams [2006] conducts the same study in Ghana in Sub-Saharan Africa and finds that remittances do reduce poverty.

Lopez-Cordova [2004] carries out a cross-section analysis of 2,400 Mexican municipalities for the year 2000 to evaluate the extent to which remittances and migration may prop efforts to augment certain welfare indicators such as infant mortality, educational outcomes, poverty and marginalization. The study uses the percent of the population with income less than the minimum wage as its poverty measure. Econometric results show that remittances are statistically significant in poverty reduction.

In a work done by Taylor, Mora, Adams and Lopez-Feldman [2005], utilizing a sample of 1,782 households in 14 states in Rural Mexico and employing poverty decomposition technique modifying the Forster-Greer-Thorbecke poverty index, the study concludes that overall, remittances, both internal and international, reduce poverty, with international migrant transfers exerting a greater amount. The paper also concludes that in the case of Rural Mexico, international remittances worsen the income inequality while, internal transfers, on the other hand, are income equalizers. The study notes that the more the number of migrants, the greater is the reducing effect of remittances on poverty.

Wodon and others [2002], as cited in World Bank [2006], find that in Guerrero and Oaxaca, two southern Mexican states with significant international emigration and remittance inflows, the share of the population living in poverty is lower by two percentage points due to remittance income. They argue that this poverty effect is similar in magnitude to that of many government programs in poverty reduction, education, health, and nutrition.

Philippine Studies

As mentioned earlier, the Philippines is one of the largest labor-sending countries and largest recipients of remittances. Increasing attention to the role of remittances in the Philippine economy has been occurring. However, currently, there are limited studies done to probe the migration-poverty nexus.

Pernia [2006] conducts a study to investigate the role of remittances in poverty alleviation and regional development utilizing panel data on the regions of the Philippines. The study empirically tests the impact of remittance on the welfare of the poor which is proxied by their mean per capita expenditure through quintile analysis. Importantly, he finds that remittances contribute to poverty alleviation which is reflected by the higher family spending of the poorest quintile which is the bottom 20% of the households. The estimation shows that a P1,000 increase in remittance per capita leads to P2,543 additional annual family spending after controlling for the effects of other local factors. Interestingly, the study also finds that this positive effect rises up to the fourth quintile and drops for the fifth quintile which he attributes to the fact that the richest quintile is less likely to have a member working as an OFW or to need remittance inflows.

Estudillo and Sawada [2006] scrutinize how trade openness and migration affect poverty reduction in the Philippines. Using provincial panel data and cross-sectional household data from 1985 to 2000, the study comes up with provincial and household-level estimates. They estimate poverty as a function of external openness, income inequality and total household income which they decompose into non-transfer income and transfer income. The study shows that both non-transfer and transfer income decrease poverty significantly with transfer income exercising a more immense poverty-alleviating impact at the household level of aggregation.

In defining the remittance-poverty interaction, Yang and Martinez [2006] utilize a different approach. The study examines the impact of remittance inflows on poverty in the Philippines using household data the years 1997-1998, which is the height of the Asian Crisis and the El Niño phenomenon using exchange rate shocks as instrumental variable for remittance receipts. This is based on the rationale that the impact of exchange rate shock on remittance receipts is strong. Results show that the impact of the instrumented remittances is negative and statistically significant. A 10 percentage point increase in remittance receipts as a fraction of household income results to a 2.8 percentage point decline in the household's likelihood of being in poverty. Using other poverty measures, the poverty gap, which is

expressed in pesos and as a fraction of the poverty line, proves negative though not significant effects. However, this study primarily focuses on a period when the country experiences economic fluctuation and does not take into account if the effects will still be the same for the other periods when the home area is not suffering from harsh economic conditions.

Indeed, the Philippine literature dealing on the links between migration, remittances and poverty are very few. There is a need to enrich the literature and explore further areas. This is the objective of our study, that is, to fill the lacuna existing in the literature by providing some innovations which have been mentioned at the outset of this paper.

4. Theoretical Framework

The theoretical framework that is presented in this section is based on a work of Stark [1991]. This framework suggests the role of migration and remittances to social welfare.

Consider an abstract economy consisting of two homogenous income groups: the lower-income group which is the traditional or rural sector and the modern or urban sector. The two groups will be denoted t and m respectively. Let f be the population shares of an income group. Thus, f^t is the share of the lower-income group in the total population and f^m is share of the higher-income group in the total population. Since the two are population shares, therefore, $f^t + f^m = 1$. Let Y be the income, hence, the uniform sectoral incomes are Y^t and Y^m respectively. Total income of the economy would be $Y = f^t Y^t + f^m Y^m$.

Yitzhaki [1982], as cited in Stark [1991], proposes a social welfare function. It is of the form:

$$W = Y(1-G) \quad (4.1)$$

where W represents welfare, Y is total income and G is the income inequality variable.

The function described above has two properties. First, an increase in the income of any member of the society is welfare augmenting. This property is consistent with both social welfare and Pareto criteria⁴. Secondly, a transfer of income from a rich person to a poor person will lead to an increase in welfare, fulfilling the “Dalton principle of transfer”.⁵ These two properties are independent of the initial distributions (Yitzhaki 1982).

⁴ “To have a grasp of welfare in this society we might think of a function where total welfare increases whenever the incomes of two groups or persons grow and whenever the increase in income of one individual does not decrease the income of the other. This is the famous *Pareto* optimality criterion” (Kakwani 2005).

⁵ “The basic idea behind this principle is that the gain of \$1 by the poor is more valuable than the loss of \$1 to the rich” (Kakwani 2005).

In this case, the post-migration distribution A will be preferred over the pre-migration distribution B if the following condition is met:

$$Y^A \geq Y^B \text{ and } W^A = Y^A (1-G^A) > W^B = Y^B (1-G^B) \quad (4.2)$$

That is, if total income after migration is greater than the pre-migration total income. It is very obvious that $Y^A > Y^B$. To prove why $W^A > W^B$, substitute a particular form of G given by

$$G = f^t - \frac{f^t Y^t}{f^t Y^t + f^m Y^m}. \quad (4.3)$$

Substituting G , we obtain

$$W = (f^t Y^t + f^m Y^m - f^t + f^t Y^t). \quad (4.4)$$

Expressing all f^t in terms of f^m , the resulting welfare equation will be:

$$W = (f^m)^2 (Y^m - Y^t) + Y^t. \quad (4.5)$$

Taking the derivative in terms of Y^m , we get

$$\frac{dW}{dY^m} = (2 f^m) (Y^m - Y^t) d f^m + [1 - (f^m)^2] d Y^t. \quad (4.6)$$

Since $f^m < 1$ and $Y^m > Y^t$, it is clear that with any $d f^m > 0$ resulting to $d Y^t > 0$, W increases.

This shows that the relatively higher total income in the modern urban village facilitates migration to the urban place. For every positive change in the proportion of people in the urban village because of migration, total income in the traditional rural village will increase which is brought about by remittances which are being transferred by migrants to their home villages. The transfer of income from the modern village to the traditional village in the form of remittances, in turn, will increase social welfare.

The theory described above shows that migration is positively related with social welfare. In addition, migration aids the transfer of income from a modern to rural sector. Thus, remittances can be regarded as income transfers. The theory also points out that due to migration, inflows of remittances to the less developed sector increase. Consequently, social welfare increases.

5. Methodology

To address the research objectives, the study employs a Panel Data Regression Approach using longitudinal data of the 16 regions of the Philippines in the years 1997, 2000 and 2003.

This chapter discusses the empirical framework adopted in the study. It then defines the dependent and explanatory variables used along with the rationale on why the specific measures are chosen. The chapter also describes the data that are utilized and then narrows down some data limitations which the authors deem to slightly or greatly affect the estimation. The latter part of the chapter specifies the econometric procedure used in the estimations.

5.1 Model Specification

In estimating the impact of migration and remittances on poverty, the empirical approach that is applied in this study is based on the frameworks of Ravallion [1997] and Adams and Page [2005].

In Ravallion [1997], the rate of poverty reduction is expressed as a function of the growth in mean income and income inequality. This is given by,

$$r = (1 - I)g \quad (5.1)$$

where r is the rate of poverty alleviation and $(1 - I)g$ is the “distribution-corrected” rate growth. The empirical finding suggests that the distribution-corrected growth in mean income is more relevant in alleviating poverty than the simple mean income.

In attempting to explore how international migration and remittances affect poverty in the developing world, Adams and Page [2005] used the basic growth-poverty model suggested by Ravallion [1997]. Their empirical model is of the following form:

$$\ln P_{it} = f(\ln \mu_{it}, \ln g_{it}, \ln x_{it}), \quad (i = 1, \dots, N; t = 1, \dots, T_i) \quad (5.2)$$

where P_{it} is the measure of poverty in region i at time t , μ_{it} is the mean per capita income, g_{it} is the Gini coefficient which is a measure of income distribution and the variable x_{it} represents two measures: the level of migration and level of remittances and μ_{it} is an error term that includes errors in the poverty measures.

Building on the model of Ravallion [1997] and on the empirical framework of Adams and Page [2005], we postulate the poverty equation as:

$$P_{it} = \mu_{it} + \beta_1(GINI_{it}) + \beta_2 \ln(GRDP_{it}) + \beta_3(X_{it}) + \mu_{it}, \quad (i = 1, \dots, N; t = 1, \dots, T_i) \quad (5.3)$$

where

$$P_{it} = \text{measure of poverty in region } i \text{ at time } t$$

$GRDP_{it}$	=	per capita income
$GINI_{it}$	=	measure of income inequality
X_{it}	=	volume of remittance or level of labor migration
μ_{it}	=	random effects across regions
ε_{it}	=	an error term

The above equation shows how poverty, P_{it} , is influenced by the region's per capita income, income distribution, and either volume of remittances or level of labor migration.

The coefficient associated with the remittance and labor migration variable, β_3 is expected to be negative after controlling for the $GRDP$ and $GINI$ variables. This is based on the findings in the literature. A negative coefficient of $GRDP$, β_2 , is also expected. This is based on the rationale that as the economy grows through growth in per capita income, the incomes of the poor also grows proportionately, though there are contrasting findings that indicate a negative relationship between economic growth and poverty reduction. A worse income distribution may aggravate poverty so a positive β_1 is expected.

The study estimates Equation 5.3 using the Generalized Least Squares (GLS)-Random Effects Method Panel Regression Approach utilizing regional time-series and cross-section data. The specification is estimated as a level equation since the dependent and independent variables differ in their sources of data.

The paper is interested in estimating the coefficient of X_{it} variable, β_3 , which represents the magnitude of the impact of the volume of remittances and level of labor migration on poverty. In addition, the study also conducts t-tests on the coefficients of these aforementioned variables to test their significance on the poverty variables.

5.2 Dependent Variable Specification

The dependent variable in the equation, P_{it} , which is poverty, is measured using the Foster-Greer-Thorbecke (FGT) poverty indices- the poverty incidence, the depth of poverty and the severity of poverty. The measures used for the dependent variables are the headcount ratio, poverty gap ratio and the squared poverty gap ratio respectively.

The poverty incidence is a measure of poverty which refers to the proportion of families with per capita income less than the per capita poverty threshold ⁶ to the total number of families. For the poverty incidence, the headcount ratio is used as the measure. The headcount measure is considerably the most commonly calculated poverty measure. Meier and Rauch [2005] points out that solely considering this measure in analyzing poverty in a particular setting would suffer from one major pitfall. The headcount measure fails to consider the fact that the poor people's income levels may exhibit wide differences. Some

⁶ This is also termed as the poverty line. In the Philippine official methodology, the poverty line is defined as the minimum income required to meet the food requirements and other non-food basic needs (1997 Philippine Poverty Statistics, NSCB).

people are located just below the poverty line and others are located far greater below the poverty line (Meier and Rauch 2005). Therefore, to overcome this drawback, the study also uses other poverty measures that consider the distance of the poor people from the poverty line and the degree of income inequality among the poor people which are captured by the other FGT poverty indices, the depth and severity of poverty.

The depth of poverty indicates how far below the poverty line the average poor household's income falls. The depth of poverty is measured by the poverty gap ratio which is defined as the total income shortfall, expressed in proportion to the poverty line, of families with income below the poverty threshold, divided by the total number of families.

The severity of poverty is the poverty measurement that is more sensitive to the income distribution among the poor. The measure used for the severity of poverty is the squared poverty gap ratio which is the total of the squared income shortfall, expressed in proportion to the poverty line, of families with income below the poverty threshold, divided by the total number of families. The severity of poverty defines how many families are located far below the poverty line. These people are termed as the "poorest of the poor."

5.3 Explanatory Variable Specification

The theoretical model presented in Chapter 4 suggests two main determinants of social welfare and in this case, poverty. These independent variables include the degree of income inequality and total income. The empirical model employed by the study decomposes total income into domestic income and remittance income. Furthermore, a variable for measuring labor migration is also introduced as an explanatory variable which is interchangeably used with the remittance variable in the estimation.

The variable *GINI* refers to the measure of income inequality which is the Gini coefficient. The Gini coefficient is the ratio of the area between the Lorenz curve and the diagonal (the line of perfect equality) to the area below the diagonal. As a measure of income inequality, the Gini coefficient ranges from 0 to 1. The larger the coefficient is, the greater the degree of inequality. Thus, the Gini coefficient limits 0 for perfect equality and 1 for perfect inequality (Meier and Rauch 2005).

For the per capita income variable, the equation uses the per capita Gross Regional Domestic Product, which is given by *GRDP*, as a measure. The National Statistical Coordination Board defines the GRDP as "the aggregate of gross value added (GVA) of all resident producer units in the region."

The variable X_{it} represents either the volume of remittances or the level of labor migration. The literature suggests two measures that can be used to represent the volume of remittances: (1) per capita remittance and (2) the ratio of remittance to gross domestic product. For the purpose of this study, both measures are alternatively. Per capita remittance which is calculated by dividing regional total remittances by regional population is expressed in natural logarithmic form. The remittance-to-GRDP ratio is computed by expressing

regional total remittances as a fraction of gross regional domestic product (GRDP). As noted earlier, X_{it} is also defined as the level of labor migration which is interchangeably used in the estimations to capture the individual effect of labor migration on poverty. The study utilizes the number of OFWs expressed in natural logarithmic form as a measure of the labor migration variable.

All variables denominated in Philippine currency, particularly, the Gross Regional Domestic Product and remittances are expressed in constant 1994 prices.

5.4 Data Description, Sources and Limitations

To explore contribution of remittances and labor migration on Philippine poverty, the study utilizes panel data on the 16 regions of the Philippines: Ilocos Region (Region 1), Cagayan Valley (Region 2), Central Luzon (Region 3), Southern Tagalog (Region 4), Bicol (Region 5), Western Visayas (Region 6), Central Visayas (Region 7), Eastern Visayas (Region 8), Western Mindanao (Region 9), Northern Mindanao (Region 10), Southern Mindanao (Region 11), Central Mindanao (Region 12), National Capital Region (NCR), Cordillera Administrative Region (CAR), Autonomous Region of Muslim Mindanao (ARMM) and Caraga for the years 1997, 2000 and 2003.

The data on poverty which include the poverty headcount ratio, poverty gap ratio and squared poverty gap ratio are taken from the National Statistical Coordination Board (NSCB) Poverty Statistics. The GRDP data are also obtained from the NSCB. The Gini coefficients are sourced from the Family Income and Expenditure Survey (FIES) which is conducted by the NSO every three years.

The data on labor migration and remittances by region for the years 1997, 2000 and 2003⁷ are taken from the annual Survey on Overseas Filipino Workers (SOF), a rider survey to the Labor Force Survey of the NSO. The Survey on Overseas Filipinos (SOF) is a nationwide survey that gathers information on Filipino citizens including overseas workers who left for abroad during the last five years. Data on number of migrants, their socio-economic characteristics and the amount, kind and method of remittance are gathered using the past six months reference period, from April 1 to September 30 every year. The SOF's definition of Overseas Filipino Workers (OFWs) includes Filipino overseas contract workers (OCWs) who are presently and temporarily out of the country to fulfill an overseas work contract for a specific length of time or who are presently at home on vacation but still have an existing contract to work abroad, other Filipino workers abroad with a valid working visa or work permits and those Filipinos abroad who are holders of other types of non-immigrant visa such as tourist/visitor, student, medical and others but are presently employed and working full time.

⁷ For 2003, only national and no regional remittance data are available, so the authors instead used the regional percentage shares in 2002 to arrive at the 2003 estimates of remittance per region.

It is also important to discuss the data limitations of the study. Basically, there are two sources of limitations of the survey data. First, in the SOF's definition of the OFWs, Filipinos with immigrant visas, though they are working abroad are not included. Therefore, their remittances are not included in the remittance data. The data seems to be underestimated. Another source of limitation is the reference period set. Since the survey covers only the OFWs and remittances within the reference period, this presents one major implication, that is, there may be a problem of underestimation both on the number of OFWs and the amount of remittances. The estimates for the number of OFWs do not take into account the Filipinos who are able to work abroad after September 30. In effect, remittance data are again underestimated. To arrive at yearly amounts, the remittances are expected to be doubled. Thus, the remittance data must have to be multiplied by two to provide an estimate of annual amounts of remittances. In addition, the setting of the reference period ignores the remittances that are usually sent during Christmas holidays. However, this limitation is somewhat compensated by the fact that extra money is also being remitted in the month of June which is the start of the academic year. Lastly, the poverty statistics obtained are in a three-year interval. This is due to the fact that the poverty calculation depends on the results of the Family Income and Expenditure Survey which is conducted by the NSO every three years. It should be noted that these limitations may affect the estimations.

5.5 Estimation Procedure

In the estimation of panel data regression models, two approaches are available: the Random Effects and the Fixed Effects Approach. In the Fixed Effect Method (FEM), there is a fixed intercept value for every cross-sectional unit. On the other hand, in the Random Effects Method (REM), the error component μ_i represents the random deviation of individual intercept from the mean value of all the cross-sectional intercepts represented by the intercept μ_{it} . The Random effects approach is applicable if it is assumed that μ_i is uncorrelated with the X regressors whereas the Fixed effects model are applied if the μ_i and the regressors are correlated (Gujarati 1995).

The study employs a Panel Regression Method using the Generalized Least Squares (GLS) – Random Effects Approach.⁸

6. Presentation of Results and Analysis

The broad purpose of this paper is to investigate whether the level of labor migration or remittances has an impact on poverty. Moreover, the study also lays out specific objectives that will help achieve the purpose. The paper seeks to identify the impact of the aforementioned variables of interest that is, whether negative or positive impact; to quantify

⁸ The study also employs a Fixed Effects Panel Estimation Approach. However, the fixed effects estimation exhibit inconsistencies among the signs of the coefficients of the explanatory variables. This estimation problem is eliminated when we resort to the Random Effects approach.

the effect and finally to test the significance of those variables in explaining poverty in the Philippines.

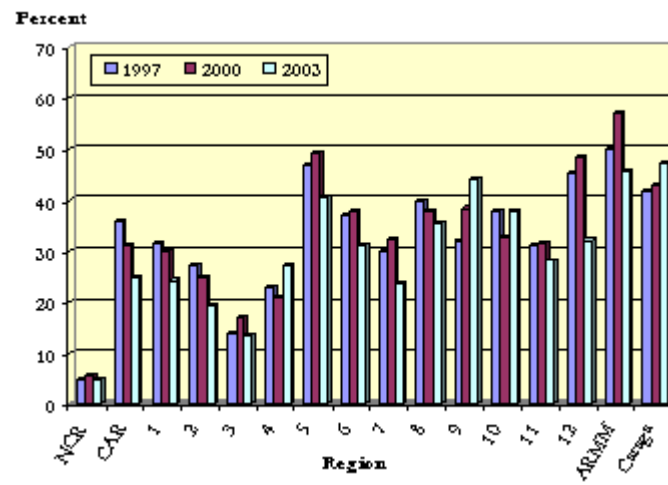
This chapter presents the raw data used in the regressions and the results of the empirical estimations of the study along with the statistical and theoretical analyses.

6.1 Raw Data

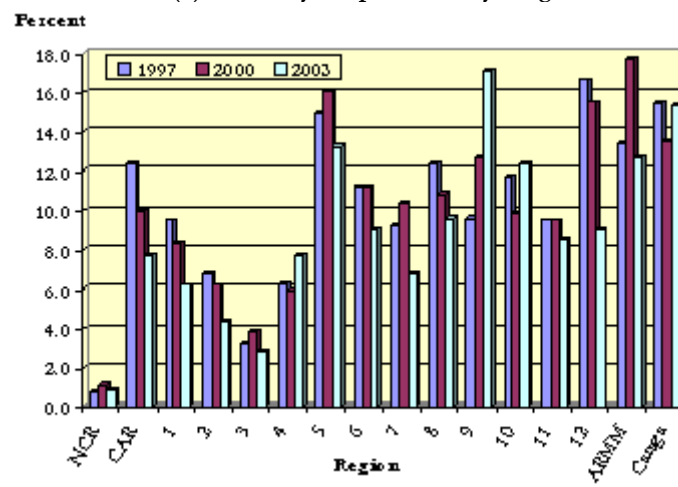
Figure 4 gives the comparative data for regions showing the incidence, depth and severity of poverty in the years 1997, 2000 and 2003. Looking at the trend in poverty incidence, the Autonomous Region of Muslim Mindanao (ARMM), Caraga Region, Central Mindanao (Region 12) and Bicol Region (Region 5) consistently exhibit the highest percentage of families below the poverty line throughout the period. It can be inferred in the figure that the regions with high poverty incidence are also the regions with high poverty gaps such as Bicol Region, Central Mindanao and Caraga Region. In these regions, the distance of the poor people from the poverty line are larger. However, the National Capital Region (NCR) demonstrates the lowest poverty gap over the three-year interval periods followed by Central Luzon (Region 3) and Southern Tagalog (Region 4). Turning to the squared poverty gap ratio that measures how severe poverty is in a specific region, the same pattern as the depth of poverty can be observed. Poverty is most severe in regions such as the Bicol and Caraga Region.

Figure 4. Different Measures of Poverty: 1997, 2000 and 2003

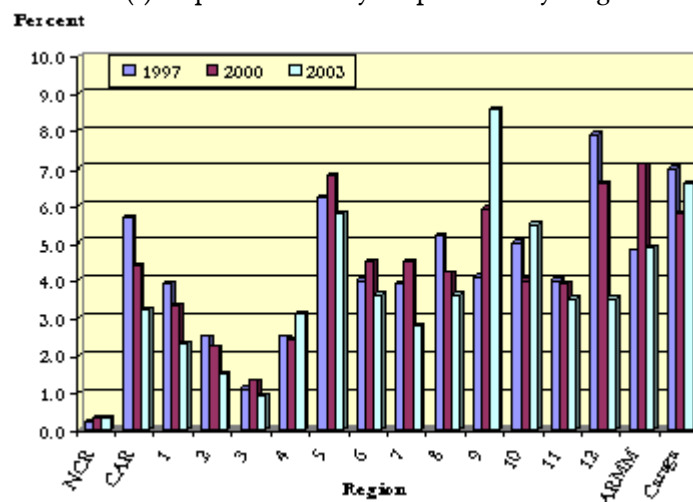
(a) Poverty Incidence by Region



(b) Poverty Gap Ratios by Region



(c) Squared Poverty Gap Ratios by Region

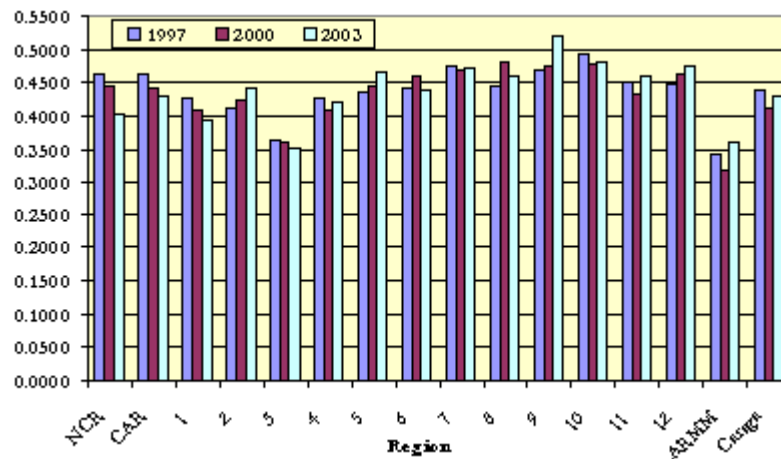


Source of Data: National Statistical Coordination Board, *Philippine Statistical Yearbook*, various years.

What could probably explain the trends in the poverty indices by region? Chapter 5 mentions three possible determinants of poverty namely the degree of income inequality, per capita GRDP and volume of remittance or level of labor migration. We now turn to the presentation of the data relating to these variables.

Figure 5 shows the data on the Gini coefficient by region.

Figure 5. Gini Coefficient by Region: 1997, 2000 and 2003

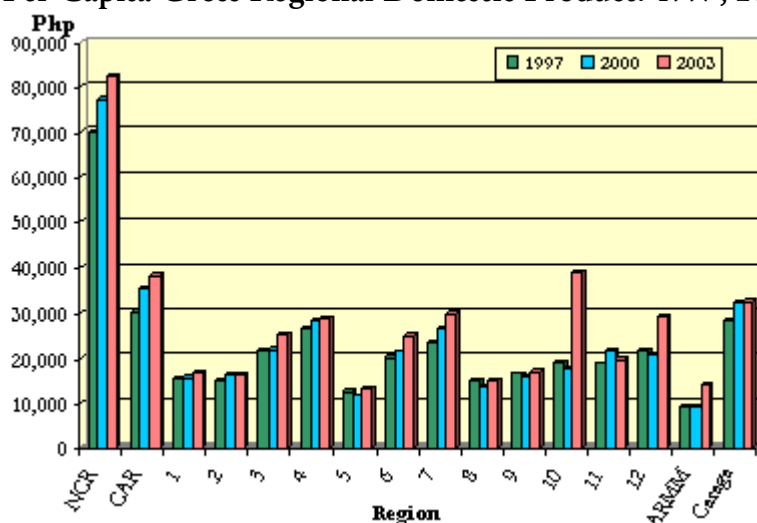


Source of Data: National Statistics Office.

The ARMM records the smallest Gini coefficient in 1997, 2000 and 2003. This is rather surprising since this region is considered as one of the poorest regions. Thus, it can be inferred that other variables can possibly explain why ARMM is exhibiting the highest poverty rates. The same conjecture can be applied to NCR, as the region with lowest poverty rates but a relatively high income inequality. However, for the other poorer regions particularly, Bicol Region and Central Mindanao, the degree of income distribution proves to be a factor contributing to their high poverty rates.

In terms of per capita income, as measured by the per capita Gross Regional Domestic product (GRDP), the regions that have the largest domestic production include NCR, CAR, Caraga, Southern Tagalog and Central Luzon (see Figure 6).

Figure 6. Per Capita Gross Regional Domestic Product: 1997, 2000 and 2003

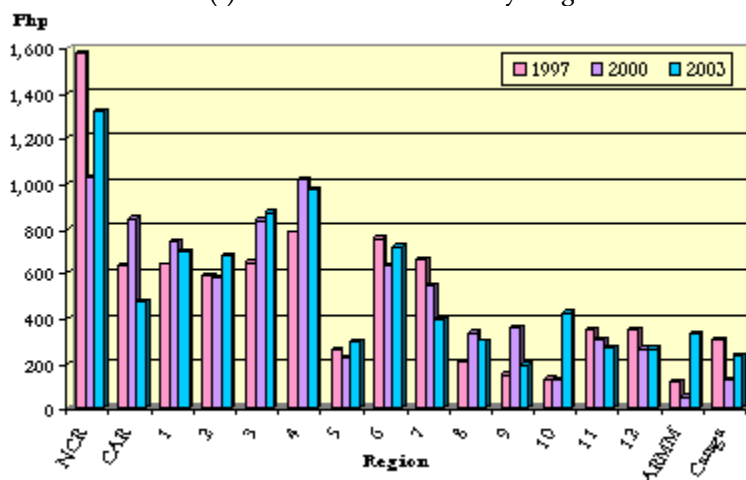


Source of Data: National Statistical Coordination Board, *Philippine Statistical Yearbook*, various years.

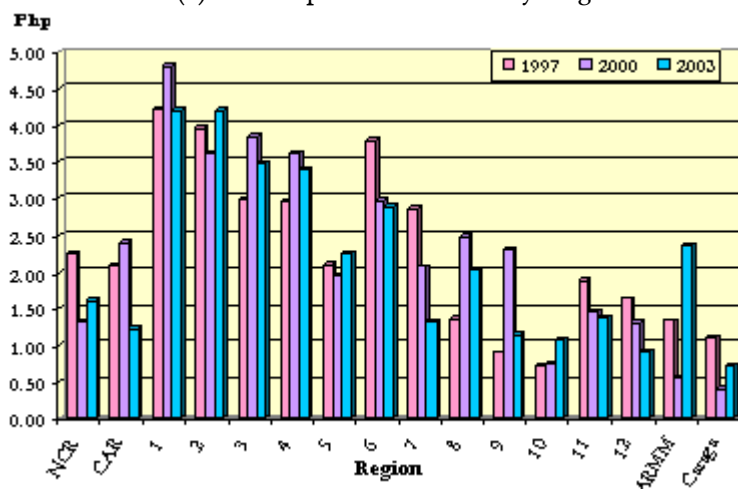
The comparative data on the different measures of labor migration and remittances are presented in Figure 7. The largest share of the total number of OFWs consistently comes from the regions near the metropolis - Southern Tagalog, NCR and Central Luzon. Other significant senders of OFWs are the regions of Ilocos and Western Visayas. On the other hand, the poorer regions of Mindanao, Eastern Visayas and Bicol Region are showing lower levels of labor migration. As seen in Figure 8, the urban regions such as NCR, Central Luzon and Southern Tagalog illustrate the highest per capita remittance while the poorer regions- ARMM, Central Mindanao and Bicol Region are the lowest in terms of per capita remittance. A rather different regional pattern can be observed if remittances are expressed as fraction of the GRDP. The top regions with the highest remittance-to-GRDP ratio are Ilocos Region, Cagayan Valley, Central Luzon and Southern Tagalog. NCR no longer ranks first which can be attributed to the fact that NCR has a very large GRDP which makes the ratio smaller. However, ARMM, Caraga and Northern Mindanao, regions with relatively high poverty rates, show low levels of remittances whatever the remittance measure used is.

Figure 7. Different Measures of Labor Migration and Remittances: 1997, 2000 and 2003

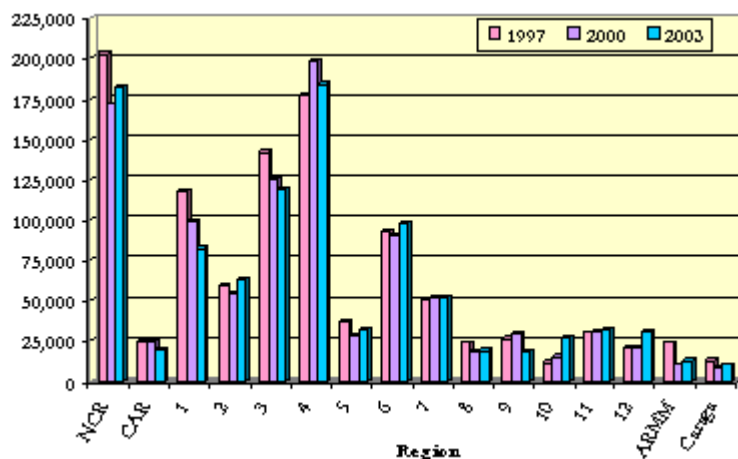
(a) Number of OFWs by Region



(b) Per Capita Remittance by Region



(c) Ratio of Remittance to GRDP by Region



Source of Data: National Statistics Office, *Survey on Overseas Filipino Workers*, various years.

6.2 Panel Regression Results

The panel regression results are shown in Table 2, Table 3 and Table 4.⁹ From the Random effects-generated regressions, several aspects should be noted. First, μ_i represents the common intercept value, which is the mean value of the random error component, ϵ_i . Second, the regional random effect tells us by how much the random error component of a certain region differs from the common intercept value. Similar interpretation applies to the other values of the random effects. In addition, the sum of the individual random effects is zero. Third, the adjusted R^2 and other statistics are obtained from the transformed Generalized Least Squares (GLS) regression.

Remittances and Poverty

Table 2 and Table 3 present the results of the estimation using the two measures of remittance variable. In both specifications, the panel estimates from the sample correspond to the predictions of the model. In all estimations, the signs of the coefficients of the explanatory variables are accord with expectations. However, not all the explanatory variables are significant in explaining the dependent variables- the incidence, depth and severity of poverty.

Table 2 shows the estimates when the remittance measure used is the per capita remittance. Looking at the income inequality variable, results suggest that the Gini coefficient is only significant when the poverty gap and the squared poverty gap ratios are the dependent variables. This implies that the more sensitive the measure of poverty is, the more responsive the degree of income inequality is. This result is consistent with the finding that the severity of poverty is the poverty measure that is more sensitive to the income distribution (Adams 2003). A positive coefficient of the Gini index suggests that greater income inequality is associated with higher poverty. Turning to the income variable, which is measured by the per capita GRDP, the estimates show that per capita GRDP is highly significant in explaining the incidence and depth of poverty but is albeit significant in explaining the severity of poverty, which only becomes significant at $\alpha > 12.32\%$. This result indicates that in the Philippines, economic growth, as measured by per capita GRDP, is less sensitive to the poor people located far below the poverty line, who are termed as the “poorest of the poor”. In a similar vein, it can also be inferred from the table that per capita GRDP exerts the strongest positive impact on the incidence and depth of poverty but not on the severity of poverty which is evident in the magnitudes of the coefficients of per capita GRDP. These findings may call for policy improvements as to how economic growth can be directly felt by the “poorest of the poor”.

We now turn to the analysis of the variable of interest, which is the level of remittances, measured by per capita remittance and its implication on the three poverty indices (see Table 2).

⁹ The complete computer-generated regression results are not shown here but are available with the authors.

When the poverty headcount ratio is used as the dependent variable, the remittance variable reflects a negative relationship which is in accordance with expectations. Moreover, the remittance variable is highly significant in explaining the headcount ratio at the 5% level of significance. The magnitude of the negative effect is reflected by the coefficient of the remittance variable. The results show that a 10% increase in per capita remittance leads to about 0.42% drop in the share of families living below the poverty line. Likewise, in estimating the effect of remittances on the poverty gap ratio, we find a consistent and significant impact of all the three explanatory variables. Since the depth of poverty measures the distance of the poor people from the poverty line, it can be interpreted that as the amount of remittances increase, the distance of the poor people from the poverty line decreases. The results prove to be in accordance with expectations. The remittance variable is also highly significant at a 5% level of significance. The regression shows that a 10% increase in the level of remittances causes an approximately 0.20% reduction in the depth of poverty. Finally, Table 2 shows the results of the regression using a more sensitive poverty measure, which is the squared poverty gap ratio, a measure of the severity of poverty. The estimation illustrates a different outcome from the previous estimations using the other dependent variables. One major difference is the quite insignificant coefficient for the GRDP variable. Using the severity of poverty measure as the dependent variable, the GRDP variable proves to be insignificantly different from zero at $\alpha=10\%$. However, the remittance variable is statistically significant at the 5% level of significance. For the squared poverty gap, estimates imply that on average, a 10% increase in the volume of per capita remittance brings about a 0.11% decline in the welfare of the people located far below the poverty line.

It is also interesting to note the summary statistics of the regressions which provide support to the outcome of the regressions. Using the goodness-of-fit criterion, the estimated GLS regression equations are quite good as revealed by the adjusted coefficients of determination R^2 .¹⁰ It can be inferred that 84% of the variation of poverty headcount ratio about its mean is explained by the variations in the Gini coefficient, per capita GRDP and per capita remittance. On the other hand, 76% and 68% of the variation in the depth and severity of poverty respectively, is explained by the regression. This relatively high adjusted R^2 suggests that there is goodness-of-fit in the regression models. Looking at the Durbin-Watson statistics, the estimates does not show any problem of serial correlation as represented by close to 2 values of the Durbin-Watson statistics.

Alternatively, using the share of remittance in regional gross domestic product instead of per capita remittance as the remittance variable, a rather similar outcome is obtained though larger poverty alleviating effects are observable (refer to Table 3). For the poverty headcount ratio, only the Gini coefficient is found to be insignificant while GRDP proves to be highly significant. The remittance variable has a negative, significant impact on poverty as reflected by a p-value lower than 5%. The results suggest that for every 1% increase in the

¹⁰ The coefficients of determination tell how well the estimated regression line fits the data or how much of the variation in the dependent variable is explained by the model. It should be noted that to test the goodness-of-fit of a multiple regression equation, the testable measure is the adjusted R^2 (Danao 2005).

share of remittances in regional GDP leads to an approximately 2.55% reduction in the proportion of families living below the poverty line. The depth of poverty is quite insignificantly affected by the income distribution but is highly affected by the GRDP and remittances. A 1% increase in the ratio of remittances to regional gross domestic product narrows the distance of the poor people from poverty line by 1.2%. When the dependent variable used is the squared poverty gap, which measures the poorness of the “poorest of the poor”, all of the three regressors are significant. However, the magnitude of the poverty effect of the remittance variable proves to be lower than the incidence and depth of poverty. The estimates imply that a 1% increase in the share of remittances in regional gross domestic product will lead to a 0.63% decline in the severity of poverty.

In sum, the results show that the volume of remittances exerts a negative significant impact on the level, depth and severity of poverty. This outcome is consistent with the findings of Adams and Page [2005], Yang and Martinez [2003], Pernia [2006] and other various studies. The study finds that the remittance variable is significantly affecting all the poverty variables. The empirical results suggest that remittances indeed reduced the incidence, depth and severity of poverty. However, the degree of poverty reduction is noticeably fairly small using the per capita remittance as the measure. For instance, a 10% increase in per capita remittance would only result to less than 1% decline in poverty. However, higher magnitudes of effects are obtained when the remittance-to-GRDP ratio is used as the remittance measure. This is because remittances are expressed as a proportion of GRDP and therefore, a slight increase in this ratio will result to a substantial reduction in poverty. On another note, the results also indicate that as we use a more intense measure of poverty, the magnitude of the negative effect is decreasing which implies that remittances have less poverty alleviating power at more sensitive measures of poverty, like the depth and severity of poverty. It is important to note that the results obtained are subject to underestimations which can be attributed to the limitations on the data used. As noted in Chapter 5, there are problems of underestimation of the total volume of remittances which are perceived to affect the results of the estimation. Thus, if it is possible for future works to overcome these data limitations, then it is expected that the remittance variable would yield even greater statistical impact.

Labor Migration and Poverty

To assess the contribution of the level of labor migration on poverty alleviation, the migration variable is introduced. As noted in Chapter 5, the migration variable is defined as the natural logarithm of the number of labor migrants.

Results of the estimation of the impact of international labor migration on the poverty equations appear in Table 4. Analyzing the adjusted R^2 , the results suggest that 88%, 81% and 75% of the variations in the incidence, depth and severity of poverty respectively, are explained by the regression model. The estimated regression equations reflect a quite goodness-of-fit. The estimations are valid and do not suffer from any problem of serial correlation which is evident in the satisfactory Durbin-Watson statistics. In our basic specifications, the signs of all the independent variables are consistent with the findings in the literature though not all exerts significant impact. Regardless of the measure of poverty used

as the dependent variable, per capita GRDP reflects a negative and significant impact. The Gini index, on the other hand, is not significant in all regressions.

The estimation results suggest that labor migration is exerting a significant statistical impact on all three measures of poverty. Indeed, labor migration aids poverty reduction in the home country. When the headcount ratio is used as the dependent variable, a 10% increase in the number of OFWs results to approximately 0.73% decline in the proportion of people living below the poverty line. The distance of the poor people from the poverty line drops by 0.29% for every 10% increase in the volume of labor migrants. The result for the severity of poverty is even more modest. The estimates suggest that for a 10% increase in the level of migration leads to a 0.13% reduction in poverty. As was the case with the remittance model, the magnitudes of poverty impact are fairly small. Likewise, this phenomenon can be attributed to data limitations previously mentioned in Chapter 5.

In sum, the results show that labor migration exerts a negative, small but significant impact on the level, depth and severity of poverty independent of the level of income and its distribution. . This is consistent with the findings of Adams and Page [2005]. The effects, though they are small in magnitude, are significant which implies a significant, direct and independent poverty reducing impact of international labor migration.

Table 2. Panel estimates of the effects of OFW remittances on poverty using per capita remittance

Explanatory Variables	Dependent Variables		
	Poverty Headcount Ratio	Poverty Gap Ratio	Squared Poverty Gap Ratio
Constant	148.57 (4.46)***	41.59 (3.26)***	14.66 (2.46)**
Gini index	0.36 (1.09)	0.24 (1.83)*	0.15 (2.34)**
Ln per capita GRDP	-10.72 (-2.97)***	-3.05 (-2.16)**	-1.06 (-1.57)
Ln per capita remittance	-4.15 (-2.05)**	-1.96 (-2.36)**	-1.07 (-2.6)**
N	48	48	48
Adjusted R-squared	0.84	0.76	0.68

Notes: T-statistics are reported in parentheses with *, **, *** denoting significance at 1, 5, and 10 percent, respectively.

Table 3. Panel estimates of the effects of OFW remittances on poverty using remittance to GRDP ratio

Explanatory Variables	Dependent Variables		
	Poverty Headcount Ratio	Poverty Gap Ratio	Squared Poverty Gap Ratio
Constant	176 (5.27)***	54.89 (4.25)***	21.71 (3.54)***
Gini index	0.28 (0.85)	0.20 (1.55)	0.13 (2.01)*
Ln per capita GRDP	-15.06 (-4.84)***	-5.14 (-4.27)***	-2.18 (-3.83)***
Remittance/GRDP	-2.55 (-2.21)**	-1.21 (-2.61)**	-0.63 (-2.82)***
N	48	48	48
Adjusted R-squared	0.85	0.78	0.70

Notes: T-statistics are reported in parentheses with *, **, *** denoting significance at 1, 5, and 10 percent, respectively.

Table 4. Panel estimates of the effects of international labor migration on poverty

Explanatory Variables	Dependent Variables		
	Poverty Headcount Ratio	Poverty Gap Ratio	Squared Poverty Gap Ratio
Constant	203 (6.89)***	62.59 (5.5)***	24.6 (4.52)***
Gini index	0.09 (0.3)	0.13 (1.08)	0.09 (1.62)
Ln per capita GRDP	-9.67 (-3.36)***	-2.8 (-2.47)***	-1.91 (-1.06)*
Ln level of migration	-7.34 (-4.51)***	-2.86 (-4.56)**	-1.36 (-4.6)***
N	48	48	48
Adjusted R-squared	0.88	0.81	0.75

Notes: T-statistics are reported in parentheses with *, **, *** denoting significance at 1, 5, and 10 percent, respectively.

7. Conclusion and Policy Implications

This paper intends to analyze the impact of international labor migration and remittances to Philippine poverty using panel data analysis. In the literature, few studies have been carried out to explore this topic. Most of these previous studies are macro-level in nature. These studies found evidence that migration and remittances reduce the level, depth and severity of poverty. With these, the study aims to substantiate this finding by extending the analysis to a micro level, that is, by utilizing panel data on the 16 regions of the Philippines for the years 1997, 2000 and 2003 and performing a pooled time-series and cross-section analysis.

The study has come up with three chief findings. These can be summarized as follows: First, the study finds that the volume of remittance – defined as per capita remittance - exerts a negative, significant impact on poverty. The results confirm the previous findings in the literature. On average, a 10% increase in per capita remittance leads to a 0.42% reduction in the proportion of the families living less than the poverty threshold. However, as opposed to what have been found by Adams and Page [2005], the impact on the more sensitive poverty measure – the depth and severity of poverty are smaller in magnitudes. The estimates suggest a 0.20% and 0.11% decline in poverty gap and squared poverty gap ratio for every 10% increase in per capita remittance. Alternatively, using the share of remittances in regional GDP, a 1% increase in this ratio results to a 2.55%, 1.21% and 0.63% reduction in the incidence, depth and severity of poverty. In all regressions, the remittance variable, regardless of the kind of measure used, proves to be significant in explaining poverty.

Second, the estimates also show that the level of labor migration – defined as the number of Overseas Filipino Workers- is exerting a significant effect on all poverty measures controlling for the level of per capita income and its distribution. As compared to the volume of remittances, the poverty reducing effects of labor migration are quite larger in magnitudes. The results show that a 10% increase in the number of OFWs as a share of population will lead to a 0.73%, 0.29% and 0.13% decline in the level, depth and severity of poverty correspondingly.

Finally, the estimation results suggest that the magnitude of the impacts of the level of labor migration and volume of remittances seem to be modest. This could be explained by the limitations of the data used as discussed earlier in this paper. Therefore, it is expected that larger magnitudes will be obtained if a more comprehensive and complete data are readily available. This provides an area for future work, that is, if it is possible to obtain more accurate data on migration and remittances, then greater magnitudes of impact are expected.

The findings in this study also reveal a number of policy implications. First, the government must exert enormous efforts to learn the importance of labor migration and how it can be used to design mechanisms and policies to utilize its potential as a tool for development specifically in alleviating poverty. Moreover, with regard to OFW remittances, mechanisms that enhance the flow of remittances and migration policies can be an important tool to poverty alleviation. In addition, policies should be concerned in reducing the costs of migration and further augmenting the benefits. The government must also provide the

OFWs' families with education on how to handle their money well and seminars to encourage them to engage in entrepreneurial activities. Lack of labor migration and remittance data hinders sound policymaking. This paper attempts to provide policymakers additional information regarding labor migration and remittances and how significant they are in reducing poverty. The results in this study will aid the government in crafting support programs and better migration policies.

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