

**THREE ESSAYS ON REMITTANCES AND FOREIGN AID TO  
DEVELOPING COUNTRIES - A REGIONAL ANALYSIS**

**By**

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Three Essays on Remittances and  
Foreign Aid to Developing Countries –  
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## **ABSTRACT**

This dissertation consists of three essays. The first essay exploits a rich Longitudinal Survey on Immigrants to Canada (LSIC) dataset to determine the attributes that affect the probability of the incidence of remittances for a subsample of South East and Southern Asian immigrants. A logit regression model is used to address key motivations of the probability to remit by immigrants who live in Canada, with a particular focus on the immigrants' labour force participation and employment, education, housing, and living conditions. Results suggest that demographic, economic, and social factors are important for individuals in making decisions about remitting.

Two questions are answered in the second essay. First, is there any significant impact of foreign financial flows on economic growth? Second, are remittances and grants more effective than loans in promoting growth? To answer these questions, the Generalized Method of Movements (GMM) technique is employed for a panel of 46 developing countries from all regions of the world during 1979 to 2011. Results suggest that remittances are most effective for all regions in promoting economic growth. Results reveal that grant-aid is also significantly associated with economic growth, while the impact of concessional loans is found to be insignificant. The varied performance of different types of financial flows is perhaps due to the fact that the obligation to repay loans made them less lucrative an option for investment mobilization.

The third essay addresses the research question: “Does the exchange rate appreciate in the face of a voluminous remittances inflow?” To answer this question, the essay devises a mean group (MG) and pooled mean group (PMG) technique to investigate the exchange rate and remittance relationship for six South and South East Asian countries (Bangladesh, India, Pakistan, Philippines, Sri Lanka and Thailand). The essay reveals strong homogeneous currency appreciation that supports the ‘*Dutch Disease*’ theoretical framework. Remittances are also found to be significantly associated with the expansion of the non-tradable goods sector at the expense of the tradable goods sector (*resource movement effect*). The presence of ‘*Dutch Disease*’ calls for active policy intervention in the face of large increases in remittance receipts.

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# **THREE ESSAYS ON REMITTANCES AND FOREIGN AID TO DEVELOPING COUNTRIES - A REGIONAL ANALYSIS**

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# **CHAPTER 1**

## **INTRODUCTION**

The rapid integration of the globe has resulted in significant movements of people from developing to more developed countries of the world. At the same time it has made it possible for immigrants to send money to their home country at a minimum cost. Hence, remittances have become a strong non-market financial flow toward developing regions that complement other flows, including concessional loans and grants. Global remittance flows (including flows towards high-income countries as well as developing countries) escalated from \$132 billion in 2000 to \$529 billion in 2012, a four-fold increase since 2000. Remittance flows towards developing countries are growing at an average rate of 5.3% per annum and are expected to reach to \$515 billion in 2015 (World Bank, 2013).

The surge of remittance flows towards developing regions has attracted researchers to explore various avenues through which remittances can affect the development process of the countries at the macro level. Meanwhile, at the micro level, academic studies have investigated what motivates individuals to remit and what the economic impacts of remittances are on both the sending and receiving households. In the last 30 years, various theoretical and methodological approaches have been put forward to examine the motivations and expenditures associated with the decision to remit (micro level studies), the impact of remittances on economic growth and the development process, and other macroeconomic issues related to this

non-market financial flow (macro level studies). In terms of spatial coverage, country specific studies as well as panel studies taking different regions or all developing countries together are evident in the existing literature. These academic studies have helped to bring about enormous immigration-related policy changes at the country, region and global levels (Doucouliagos & Paldam, 2009).

Johnson and Whitelaw (1974) laid out the first working framework for a theoretical understanding of economic motivations to remit. They argued that the motivation to remit is completely *altruistic* in nature. Individuals send money simply to increase the utility of recipient households and do not consider their own utility. Lucas and Stark (1985) came up with an even broader perspective to account for the underlying motivations to remit. According to their theoretical framework, motivations are driven by *self-interest* in addition to *altruism* if individuals send money to take care of their leftover wealth or to increase existing wealth to secure higher future income if they desire to return to their country of origin. Researchers took this framework seriously and it has extensively been applied in empirical research. Nonetheless, empirical conclusions were mixed and favoured both types of motivations (Glytsos, 1997; Osili, 2007). Researchers recently considered a holistic approach to analyze determinants of the decision to remit, arguing that motivation models alone are not sufficient to capture the holistic nature of the decision. The decision to remit could be influenced heavily by the sender's education, the cost of living in the host country, the cost of migration, and the culture and norms of the host country (Sander, 2003). Increasing amounts of survey data on immigrants, both at the

sending and receiving ends, has allowed researchers to examine the various attributes of individuals that can affect the decision to remit and the utilization of remittances.

On the macro level, extensive research has been devised to explore the impact of remittances on economic growth (Pradhan, Upadhyay & Upadhyaya, 2008; and Aggarwal, Demirguc-Kunt & Martinez Peria, 2006), other channels like, financial development, through which remittances can affect growth (Giuliano & Ruiz-Arranz, 2009), the impact of remittances on consumption and investment (Das and Serieux, 2010), remittances and exchange rate fluctuations (Lartey, Mandelman, & Acosta, 2008), and many more. Research findings were found to be broadly inconclusive at the macro level. Remittances and economic growth studies followed the same trajectory as observed for foreign aid and economic growth studies. While Pradhan, Upadhyay & Upadhyaya (2008) found a strong positive impact of remittances on economic growth, Chami, Fullenkamp & Jahjah (2005) found a negative impact, while Spatafora (2005) found no association between remittances and economic growth. On the aid-growth nexus, after reviewing 68 previous studies, Doucouliagos & Paldam (2009) concluded that the prevailing literature *sadly* failed to arrive at any conclusions regarding the impact of aid on economic growth. The perceived failure to reach a consensus was mostly related to limited data availability, model specification bias (Hansen & Tarp, 2000), and the failure to acknowledge the heterogeneous impact of different components of financial flows on economic growth (Loxley & Sackey, 2008).

Studies focusing on remittance flows and its impact on the exchange rate, another important area of research, have gained momentum in the last ten years. A

sudden surge of remittance flows toward the developing world opened the avenue to explore the negative impact of remittances that can be caused by the appreciation of the exchange rate, followed by a contraction of the tradable goods sector - the process known as the '*Dutch Disease*' effect. According to the '*Dutch Disease*' theoretical framework, a large inflow of capital in the form of remittances might expand aggregate demand through increased household income. The higher demand might then lead to a rise in the relative price of non-tradable goods. This would eventually cause a resource movement from the tradable to the non-tradable goods sector leading to real exchange rate appreciation. For small open economies, exchange rate appreciation might have severe negative impacts, as it could impair the development of the export sector and in the long-run economic growth (Lartey, Mandelman & Acosta, 2008).

The three essays of this dissertation attempt to fill in gaps in the existing literature on the determinants of remittance sending behaviour and its impact on overall economic conditions of developing countries by exploiting rich survey and country-specific longer time series data and better and appropriate techniques, and taking a regional approach into account. To that end, the first essay investigates determinants of the incidence of remittances of Canadian permanent residents from the South and South East Asian (SA) region. Specifically it addresses the question "what motivates an individual to remit?" The essay considers the holistic approach of accounting for determinants of remittance incidence. It exploits the recent Longitudinal Survey of Immigrants to Canada (LSIC) dataset to examine the determinants that affect the probability to remit to the SA region, as immigrants from

this region are highly motivated remitters compared to immigrants from other regions. To the author's knowledge, there is no study thus far that focuses on this particular region. The model is measured using the LOGIT regression method. One caveat of this type of microeconomic modeling is that models can often suffer from endogeneity bias, if explanatory variables exhibit bi-directional causality with the dependent variable. For instance, higher incomes could lead to a higher remittance incidence, and at the same time individuals could strive for higher earnings if remittances become an essential part of their economic decisions. The LSIC has a longitudinal design with immigrants being interviewed at three different times: at six months (wave-1), two years (wave-2) and four years (wave-3) after landing in Canada. The essay utilizes the longitudinal design of the survey to correct for the existence of any potential endogeneity associated with remittances within the model. Dependent (incidence of remittances) and independent variables are selected from different time lagged responses (waves) for the same respondent to disentangle any causality that existed between the two. The first essay therefore examines the determinants of the probability of remittance incidence for immigrants from the SA region and also looks into marginal changes to the determinants when individuals stay longer in the host country – i.e., as the cohort ages.

The second and third essays focus on the macro dynamics of remittances while taking the regional approach into account. In most of the existing literature, the economic growth impact of remittances and foreign aid are measured separately. It was only later that academic studies began to recognize the differential impacts of different components of foreign aid on economic development process. Developing

countries receive concessional loans and grants under different conditions. Loans are given with a promise of repayment and are often used for debt servicing (Kenen, 1990). In contrast, remittances and grant-aid are transfers to developing countries without any expectation of repayment. Therefore, a different growth impact is inevitable for these types of flows. The significant contribution of the second essay is the computation of all non-market financial flows within a single framework to examine their comparative effectiveness and their nexus with GDP growth. The essay examines 46 developing countries from different regions of the world. Individual impacts of disaggregated financial flows on economic growth are measured by applying the first differenced Generalized Method of Moments (GMM) technique proposed by Arellano and Bond (1991). The GMM is found to be a better and consistent estimator when endogeneity is evident in any model. In addition, the essay also examines regional variations by estimating the same model for different regions (Asia, Africa and Latin America).

The third essay focuses on exploring whether remittances cause the '*Dutch Disease*' effect in the long run. Six countries (Bangladesh, India, Pakistan, Philippines, Sri Lanka and Thailand) from the South and South East Asian region are taken into consideration where remittance growth is significantly higher (greater than 4.5%) compared to other Asian countries. The essay examines both long run and short-run dynamics of exchange rate appreciation in the presence of a surge in remittances flow, applying mean group (MG) and pooled mean group (PMG) estimation techniques proposed by Pesaran, Shin and Smith (1999). In addition, the study also examines the dynamics of resource movement from the tradable goods

sector to the non-tradable goods sector, taking the impact of remittances into account.

There is no panel study found in the existing literature that focuses on exploring these issues for this specific region where remittances are becoming a significant source of foreign financial inflow.

## **REFERENCES**

- Aggarwal, R., Demirguc-Kunt, A. & Martinez Peria, M.S. (2006). Do Workers' Remittances Promote Financial Development? *World Bank Policy Research Working Paper*, No. 3957.
- Arellano, M. & Bond, S. (1991). Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. *Review of Economic Studies*, 58(2), 277-97.
- Chami, R., Fullenkamp, C. & Jahjah, S. (2005). Are Immigrant Remittance Flows a Source of Capital for Development? *IMF Staff Papers*, 52(1), Washington, DC: IMF.
- Das, A. & Serieux, J. (2010). Remittances and Reverse Flows in Developing Countries. *The IDEAs Working Paper Series*, 02, 1-30.
- Doucouliafos, H. & Paldam, M. (2009). The Aid Effectiveness Literature: The Sad Results of 40 Years of Research. *Journal of Economic Surveys*, 23(3), 433-61.
- Giuliano, P. & Ruiz-Arranz, M. (2009). Remittances, Financial Development, and Growth. *Journal of Development Economics*, 90, 144-52.
- Glytsos, N.P. (1997). Remitting Behavior of 'Temporary' and 'Permanent' Migrants: The Case of Greeks in Germany and Australia. *Labour*, 11(3), 409-35.
- Hansen, H. & Tarp, F. (2000). Policy Arena: Aid Effectiveness Disputed. *Journal of International Development*, 12, 375-398.
- Johnson, G.E. & Whitelaw, W.E. (1974). Urban-Rural Income Transfers in Kenya: An Estimated Remittances Function. *Economic Development and Cultural Change*, 22(3), 473-79.



- Kenen, P.B. (1990). Organizing Debt Relief: The Need for a New Institution. *Journal of Economic Perspectives*, 4(1), 7-18.
- Lartey, E.K.K., Mandelman, F.S. & Acosta, P.A. (2008). Remittances, Exchange Rate Regimes, and the Dutch Disease: A Panel Data Analysis. *Federal Reserve Bank of Atlanta Working Paper Series*.
- Loxley, J. & Sackey, H. (2008). Aid Effectiveness in Africa. *African Development Review*, 20(2), 163-199.
- Lucas, R.E.B. & Stark, O. (1985). Motivations to Remit: Evidence from Botswana. *Journal of Political Economy*, 93(5), 901-18.
- Osili, U.O. (2007) Remittances and Savings from International Migration: Theory and Evidence Using a Matched Sample. *Journal of Development Economics*, 83(2), 446-65.
- Pesaran, M.H., Shin, Y. & Smith, R.P. (1999). Pooled mean group estimation of dynamic heterogeneous panels. *Journal of the American Statistical Association*. 94, 621-34.
- Pradhan, G., Upadhyay, M. & Upadhyaya, K. (2008). Remittances and Economic Growth in Developing Countries. *European Journal of Development Research*, 20(3), 497-506.
- Sander, C. (2003). *Migrant Remittances to Developing Countries: A Scoping Study Overview and Introduction to Issues for Pro-poor Financial Services*. Prepared for the UK Department of International Development (DFID), Bannock Consulting.

Spatafora, N. (2005). Two Current Issues Facing Developing Countries. *World Economic Outlook*, International Monetary Fund, Washington, DC.

World Bank. (2013). *Press Release on World Bank Launches Initiative on Migration, Releases New Projections on Remittance Flows*, retrieved from: <http://www.worldbank.org/en/news/press-release/2013/04/19/world-bank-launches-initiative-on-migration-releases-new-projections-on-remittance-flows>.

## **CHAPTER 2**

# **WHO REMITS? A LOGIT REGRESSION ANALYSIS OF IMMIGRANTS FROM SOUTHERN PARTS OF ASIA TO CANADA<sup>1</sup>**

### ***2.1 INTRODUCTION***

Given the role migration has played in shaping Canadian society, it is an important issue for Canada as well as for the countries of origin of the migrants. Since the beginning of the 21st century, Canada has been welcoming immigrants to overcome labour shortages. In 2008 approximately a quarter million immigrants arrived in this country. Prior research showed that new immigrants to Canada (who arrived in the last five years) wanted to provide financial support to other family members who were left behind in the home country (Houle & Schellenberg, 2008). From a theoretical perspective, both home and host countries could benefit from immigration. Immigrants participate in the labour force of the host country and help generate domestic income. Concurrently, a part of this income, if remitted, might have significant impact on the development process of the home country. Hence, for policy-makers of the host country, it is important to understand the remittance behaviour of immigrants.

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<sup>1</sup> While the results are based on Statistics Canada data, the opinions expressed in this study do not represent the views of Statistics Canada.

In recent years, studies have identified the immigration trend and focused on different aspects of immigration to Canada (Boyd, 1976, 2002; Richmond, 1992, 2000; Borjas, 1994; Baker & Benjamin, 1995; Green & Green, 1995; Aycan & Berry, 1996; Henry, Hastings & Freer, 1996; Noh & Avison, 1996; Reitz & Sklar, 1997; Roberts & Doob, 1997; Li, 1997, 2001, 2003; Grant, 1999; Noh et al, 1999; Boyd & Vickers, 2000; Kazemipur & Halli, 2001; Reitz, 2001; Ataca, 2002; Houle & Schellenberg 2008; Quddus, 2008). Surprisingly, very few researches have actually studied the remittance sending behaviour of international migrants to Canada. One reason for such a deficiency in the literature was the absence of survey-based micro level data. Recently Houle & Schellenberg (2008) used the Longitudinal Survey on Immigrants to Canada (LSIC) dataset and found that financial and family characteristics of immigrants from all world regions were crucial in determining remittance behaviour. One of the shortcomings of this type of panel data analysis was that all migrants were treated as one entity. Hence this investigation failed to generate any country-specific or regional results. In fact, Houle & Schellenberg implicitly identified this problem and left the question for future research (2008: 24). While unavailability of data makes it difficult to control for characteristics of the country of origin, regional characteristics can be controlled for when the number of participants in the survey is large.

This study aims to address this gap in knowledge by using recent longitudinal data from the LSIC, which is a large survey with a representative sample of new immigrants from a number of different countries to Canada. The study focuses on new immigrants from South East Asia and South Asia, henceforth SA. Countries

from this region include Cambodia, Indonesia, Malaysia, Philippines, Thailand, Bangladesh, India, Nepal, Pakistan and Sri Lanka. Singapore and Vietnam have been excluded due to the very small size of samples. The research further regroups the country of origin variable into six categories: Philippines, Bangladesh, India, Pakistan, Sri Lanka and other SA regions. The SA region was among the top three immigrant sources to Canada, offering a large number of well-educated skilled workers and professionals. In 2006 migrants from SA became Canada's largest visible minority group, having the strongest labour market performance (Statistics Canada, 2011). Moreover, SA immigrants were likely to start remitting early and send more money on average compared to those from other regions (Houle & Schellenberg, 2008).

To that end, this study contributes to the existing literature on remittances in the following ways. First, it exploits the recently published LSIC dataset to understand the determinants that affect the probability to remit to the SA region, as immigrants from this region are highly motivated remitters compared to immigrants from other regions. To the researcher's knowledge, there is no study thus far that focuses on this particular region. Second, the study utilizes longitudinal design of the survey to correct for the existence of potential endogeneity problems of remittances within the model. Dependent (incidence of remittances) and independent variables are selected from different time lagged responses for the same respondent to disentangle any causality that may exist between the two.

The rest of the paper is organized in the following manner. Section 2.2 reviews the literature, section 2.3 discusses econometric methods and data issues, section 2.4 presents empirical results, and section 2.5 presents concluding remarks.

## **2.2 REVIEW OF LITERATURE**

Literature on remittance behaviour of migrants goes back to the 1970s when Johnson and Whitelaw (1974) first elucidated the theoretical model. They argued that migrants are *altruistic* in nature and their remittance behaviour involves a set of non-economic factors, including the utility function of the recipient household as opposed to their own utility function. Therefore, remittance flow is inspired by the selfless motive of increasing family welfare. From an empirical viewpoint, it is expected this flow would possibly decline with a rise in the recipient household income.

Lucas and Stark (1985) introduced a broader perspective of motivation to remit in addition to the *altruistic* motive. They said the motivation to remit is not only *altruistic* but a combination of *pure altruism*, *pure self-interest*, and *inter-temporal* contractual agreements between migrants and their families. According to Lucas and Stark, the *self-interest* motivation arises due to three key factors. First, *self-interest* refers to a desire to secure an inheritance from the country of origin. People may send money simply to take care of their leftover wealth or assets at home. Second, it refers to the acquisition of assets that could be utilized in the future. The third motivation is related to the nature of immigration which would work only if an immigrant had the desire to return to the home country. In this case, remittances take place in order to secure a smooth permanent income for the future and to accumulate a handy stock of wealth if they desired to return.

The borderline between *self-interest* and *pure altruism* is often hazy and is defined as *tempered altruism* or *enlightened self-interest*. This opens up a third category: *inter-temporal* contractual agreement, which is a mutually beneficial contract between migrants and their families with a promise of sending money upon arrival at the new home. Remittances work as an insurance to the receiver to survive during lean periods. The sender finds him/herself obligated because of *self-interest* motivation factors or for *altruistic* motivation factors, and hence the contract become self-enforced and confined to the family (Carling, 2008; Thankom & Hulya, 2011). Therefore, *tempered altruism* refers to *altruistic* motivations to remit that originate in order to enforce the contract. *Enlightened self-interest* occurs when the reinforcement of the contract is fulfilled by *self-interest* motivations.

Empirical evidence regarding this type of confined and structured motivation model was rather inconclusive. Glytsos (1997) found support in favour of the *self-interest* motivation for Greek migrants in Germany and Australia. On the contrary, a study on Nigerian migrants to the USA found that the amount of remittances diminished for richer families in the home country, an outcome supporting the *altruistic* motivation model (Osili, 2007). For a matched sample, Osili concluded that altruism was the main motivation to remit, as the study did not find any evidence to support other types of motivation. Sana and Massey (2005), using a Logit regression model on remittance receiving households, applied the motivation model to explain the remittance behaviour of immigrants from Mexico, Nicaragua, Costa Rica, and the Dominican Republic. In the case of Mexico, the motivational model fit well to explain remittance behaviour. However, the model failed to explain the remittance

behaviour of immigrants from the Dominican Republic with the same framework. While the study found evidence that household's risk diversification strategy played a crucial role to ensure the flow of remittances in Mexico, an *enlightened self-interest motivation*, such family-level motivations were absent for the case of Dominican Republic. The authors concluded the differential performance of the model could be attributed to the social and cultural differences between the two societies. As Mexican society is traditional and patriarchal, its citizens' remittances were driven by motives of family obligations. In contrast, society is more modern in the Dominican Republic and hence conjugal relations are found to be unstable. The Dominican remittances were driven by pure individualist motives and did not follow any pattern. Therefore, it can be argued it is difficult to apply the motivation model without considering other determinants of remittance.

While *pure altruism*, *pure self-interest* and *tempered altruism* are important factors to determine migrants' decisions to remit, recently published articles argue that motivation models have failed to capture the holistic nature of this decision, as many other factors could have a potential influence on remittances. The dynamics of remittance behaviour can be heavily influenced by income received and the cost of living in the host country, types of families and households, and the culture and norms of the host and home countries. Sander (2003) identified several demographic and economic factors such as the migrant's profile, political and economic volatility in the home country, and financial strength that can influence the size and incidence of remittances.



Taking a holistic approach into consideration, Menjivar et al. (1998) found that a number of factors including demographic characteristics, financial capacity to remit, the intent to pursue permanent naturalization in the host country, personal investment, and family obligations determined the incidence and size of remittances for immigrants from the Philippines and El Salvador.

Very few studies attempted to investigate the remittance behaviour of Asians, and more specifically South Asian migrants. Clark and Drinkwater (2007) found the probability of remittances by South Asian immigrants to the United Kingdom was mostly driven by income and employment status. Thankom and Hulya's (2011) research also supported these findings for immigrants in Manchester, UK. Additionally, they found that education and years of residence were important determinants when the amount of remittances as opposed to incidence of remittances was taken into consideration.

Not atypically, the literature on Canadian immigrants is scanty due to the non-existence of survey data on immigrants prior to the commencement of the LSIC. Houle and Schellenberg (2008) analyzed remittance behaviour using the LSIC dataset. They found a strong association of income, employment, age, savings, and other non-economic factors related to the incidence of remittance. Shooshtari et al. (2013) also used the LSIC data to determine remittance behavior and its effects on lives of Filipino immigrants, taking the holistic approach into account. The study found that remittance-sending behavior is not going to affect remitter's own health. However, it is found to affect remitters housing and living conditions. A remittance

sender is less likely to own a home and more likely to rent a place when compared with non-remitters.

Following Houle and Schellenberg (2008), this study adopts the holistic approach to investigate the incidence of remittance taking demographic and socio-economic conditions of immigrants for different periods of time into account. The longitudinal nature of the dataset allows this research to observe the same individual in three different time periods after his/her arrival to Canada, i.e., six months (wave-1), 24 months (wave-2) and 48 months (wave-3). The study explores whether socio-economic and demographic conditions after arrival (wave-1 and wave-2) have any impact on the probability of remittances in the future (wave-3). This data on different waves allows an investigation on how different conditions over time may impact the remittance behaviour of migrants.

## ***2.3 METHODOLOGY***

### **2.3.1 Data Source**

Data used in this study was obtained from the three waves of the LSIC (2000-2004). The LSIC was conducted jointly by Statistics Canada and Citizenship and Immigration Canada (CIC) to collect information on a representative cohort of recent immigrants to Canada. The initial selection of immigrants was done by selecting immigrants from the CIC database. The LSIC has a longitudinal design with immigrants being interviewed at three different times: at six months (wave-1), two years (wave-2) and four years (wave-3) after landing in Canada. A wide range of information was collected by the LSIC, including immigrants' perceptions, values and attitudes at specific points in time to assess their integration during the first four

years of residency in Canada. To facilitate the longitudinal analysis, the LSIC wave-3 data file was used, which contains data from all three waves of the survey. This file contained a total of 7,716 records for respondents who participated in all three waves. For all estimates, the study used bootstrap weights provided by Statistics Canada. The complex design of the survey calls for using the bootstrapping procedure in order to minimize the variance of the estimation.

### **2.3.2 Study Population**

The population of this study was selected by choosing respondents who immigrated to Canada from the SA region. Responses to the variable “region of origin” were used to select the study sample. A total of 53,064 individuals aged 15+ immigrated to Canada from SA between October 1, 2000 and September 30, 2001. Figures 2.1 and 2.2 show the proportions of remitters and the average amount of remittances sent towards this region after two to four years of arrival respectively. It is evident from Figure 2.1 that immigrants from the Philippines were the highest remittance senders compared to those from other SA countries. All results were statistically significant as the vertical lines of confidence intervals revealed. For those persons from all other countries, the proportion of remitters was fairly similar to that of the total survey population average of 30%.

In terms of amount sent, those from Sri Lanka and Bangladesh were the highest and lowest remitters in the region respectively. All results were statistically significant except for Sri Lanka. The average amount sent by immigrants of this region (\$3,600) was higher than the survey population average (\$2,900) and highest across all regions (Houle & Schellenberg, 2008).

### 2.3.3 The Model

This model relies heavily on Clark and Drinkwater's (2007) model. An unobservable latent variable  $y_i^*$ , which illustrates the household remittance behaviour, is used as the dependent variable. The regression model can be depicted as follows:

$$y_i^* = x_i\beta + \varepsilon_i \dots \dots \dots (1)$$

where  $i=1, \dots, n$ ,  $x$  is the vector of the household's socio, economic and demographic characteristics, and  $\beta$  is the vector of parameters to be estimated with a random error  $\varepsilon$ . A dummy is assumed,  $d_i=0$ , if  $y_i^*>0$ , if the individual remitted, and 1 otherwise.

To estimate this model, a simple logit regression technique is applied. For each explanatory variable, using one selected group as reference group, logistic regression is estimated. The usual strategy would be to estimate response probability,  $P[y_i = 1 | x_i]$ , which essentially means probability to remit is conditional on  $x_i$  - explanatory variables.

$$\text{The logistic model arises when } F(x_i'\beta) = \frac{e^{x_i'\beta}}{1 + e^{x_i'\beta}} = \Lambda(x_i'\beta)$$

where  $\Lambda(\ )$  is the logistic distribution, which assumed that probabilities of the coefficients are not linear in the vector of  $X$  (Menjivar et al., 1998; Green, 2003).

The next modification is due to a correction of endogeneity. Endogeneity can arise if the dependent variable and independent variable(s) are related bi-directionally. For instance, on one hand, higher income could lead an individual to remit more; but on the other hand, higher remittance sending necessities could drive an individual to earn more. In order to correct for this type of potential endogeneity, this study

exploits the longitudinal design of the survey and will estimate two models. In both models, the dependent variable is selected from wave-3. However, the first logit model considers all explanatory variables from wave-1 and the second model considers all explanatory variables from wave-2. The expectation is that remittances and income (or any other explanatory variables) may have bi-directional causality within the same wave responses but not across different waves. This modification would provide two advantages. First, it would allow minimizing the bias originated from endogeneity within explanatory variables. Second, the two models would help investigate the dynamics of remittance behaviour when respondents moved from the six months cohort to the 24 months cohort. Hence, the comparison between waves could determine whether the length of stay (time variance) could change the motivation to remit.

The last modification made to the estimation is computing marginal effects after estimating the logit regression model. The logit regression coefficient itself does not contain any meaningful interpretation (Green, 2003). The study therefore calculates the marginal effect of each category in a variable, keeping all other variables at their mean. Marginal effect coefficients display the relative change in a probability of incidence of remitting compared to the reference group within each category of a variable.

#### **2.3.4 Dependent Variable**

Remittance is the dependent variable as this study attempts to shed light on remittance behaviour of immigrants from SA. Remittance behaviour of the survey respondents was based on the migrant's response to a single question at each wave of

the survey. The question at wave-1 was “Since you came to Canada, have you sent money outside Canada to relatives or friends?” At waves 2 and 3, the same respondents were asked, “Since your last interview, have you sent money outside Canada to relatives or friends?” Those who responded ‘yes’ to these questions were classified as remitters and those who responded ‘no’ were classified as non-remitters. The remittance incidence of the study participants is then examined longitudinally over the four years of the study period. 30.83% of the total population remitted after two years (wave-2) of arrival and the rate increased to 35.5% after four years of arrival in the region.

### **2.3.5 Independent Variables**

The purpose of this paper is to explain the intrinsic factors that may have effects on remittance sending behaviour of immigrants. The study divided all explanatory variables into three broad categories by taking endowment aspects of remittance sending motivations into account: socio-demographic variables, financial or economic endowment variables, and other capacities to remit variables.

The next step is to identify how independent variables of wave-1 have potential effects on the probability to remit in wave-3, and how independent variables of wave-2 might affect the probability to remit in wave-3<sup>2</sup>.

#### ***2.3.5.1 Socio-Demographic Variables***

Sex, age, marital status, immigration status, country of origin, and city lived in after arrival are the main variables discussed under this category. Sex has two categories: male and female. 49.05% respondents in our dataset are female. Age is

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<sup>2</sup> We did not look at wave-2 incidence of remittances due to fewer incidences of remittances.

categorized as young: less than 35 years old (54.51%), middle aged: 35 to less than 55 years old (35.9%), and old: above 55 years old (9.59%). The age variable is constructed following Shooshtari et al. (2013)<sup>3</sup>. This variable is also considered for wave-2. Marital status is divided into three broader categories - single or never married, married or common law, and others consisting of divorced or widowed. The marital status variable is calculated for both wave-1 and wave-2. Among all respondents in wave-1, 19.07% were single, 77.52% were married, and 3.41% were from the other category. For the purpose of this study, an immigration class variable is derived based on the following three categories as 1) family class; 2) economy class (federal and provincial skilled workers); and 3) other class including refugees. 39.79% of immigrants entered Canada under the family category, while 56.89% entered under the economy class. Only 3.32% came to Canada under the 'other' category. For the country of origin variable, 23.26% respondents were from the Philippines, 5.37% were from Bangladesh, 46.28% were from India, 14.09% were from Pakistan, 6.9% were from Sri Lanka, and 4.1% were from other countries in SA region. 76% of all respondents lived in three major cities (Toronto, Montreal and Vancouver) after their arrival, while 19% lived in other cities and 5% lived either in rural areas or in non-Census Metropolis Areas (CMA).

#### ***2.3.5.2 Financial or Economic Endowment Variables***

Income, employment and education are the key economic endowment variables used in this study. The income variable is derived from the individual

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<sup>3</sup> While Shoostari et al. (2013) used less than 25 years as young, we chose less than 35 to accommodate data disclosure procedures of Statistics Canada.

income of respondents reported at wave-1 and wave-2. It is defined as income from all sources inside Canada, which includes employment and other non-employment income. Houle & Schellenberg (2008) used family income based on the assumption that remittance is a family decision and family income would be a better measure of remittance sending behaviour. This study's approach departs from using family income on the ground that the survey data is based on individual migrants instead of households. Therefore, taking individual income is likely to be a better reflection of the judgmental accuracy of the respondents.

Respondents are classified into the following six groups: 1) those who reported having annual income less than \$10,000; 2) those having annual income between \$10,000 and \$24,999; 3) those having annual income between \$25,000 and \$49,999; 4) those having annual income between \$50,000 and \$69,999; 5) those having annual income of \$70,000 or higher; and, 6) those who did not report their annual income. After two years of being in Canada (wave-2), 4.30% had income less than \$10,000, and 15.63%, 37.24%, 17.66%, 12.96% and 12.21% were respective response categories mentioned earlier. It is worth noting that SA immigrants have a higher proportion of non-reporting category even after two years of arrival.

The employment status variable indicates the current work status of all respondents as to whether they were an employed worker or unemployed. 56.66% became employed after six months of arrival, while 64.38% became employed after two years of arrival.

The formal education of respondents before coming to Canada is categorized into six groups: no formal education, less than or equal to high school, some college,



undergrad or some university; graduate study; and trade certificate or other types of studies. The SA group of immigrants was found to be highly skilled in terms of educational attainment. More than 97% of respondents have some formal education, while 55% have some university attachments including undergrad and graduate studies.

#### ***2.3.5.3 Other Capacities to Remit Variables***

Dwelling expenditures is one of the major costs in Canada. Therefore structure and cost of living are included as independent variables to capture the effect of expenditure that could pose a constraint on the incidence of remittances. The household structure variable has three categories: living with children, living without children, and not reported. The cost of dwelling variable explains the arrangement of living and has five categories: owners with mortgages, owners without mortgages, renters, other living arrangements, and not reported. The last variable included in the model is the group variable following Houle and Schellenberg (2008), which explains whether the respondent is involved in any group activities that include church, community organizations or any other form of group. The variable has three categories: involvement with no groups, one group, and more than one group.

All analyses employed appropriate weights for the LSIC to ensure the data was representative of the population aged 15+ who immigrated to Canada from SA between October 1, 2000 and September 30, 2001. Characteristics of the study population at the baseline (wave-1) are described in Table 2.1.

## **2.4 RESULTS**

### **2.4.1 Bivariate Outcomes**

Results from the bivariate analysis are presented in Table 2.2. The study uses column percentages to show the proportions of remittance senders and non-senders across categories. All variables are computed from wave-1. Therefore, the table portrays bivariate results of remittance incidence in wave-3 to indicator variables in wave-1. Results from bivariate analysis ( $\chi^2$  test) indicate that all variables have significant association with the likelihood of remittances in wave-3. Out of all remitters, 56.47% are male. The incidence of remittance is high in the young group of immigrants (57.62%) and the married group (77.27%). A higher proportion of economic class immigrants (63.27%) are remitters compared to the family class or other immigrants. The incidence of remittance is also found to be high if the respondent was from either the Philippines (40.58%) or India (33.05%) compared to other countries in the region. Most remitters live in three big cities (71.98%). Income response is mixed. Out of all remitters, low-income groups (less than \$25,000) and non-reported group have higher proportions of remitters compared to the higher income groups. Almost 85% of respondents fell into these three categories. The education variable reveals that nearly 50% of all remitters have some university education. Renters (69.27%) and respondents with no group activities (73.06%) are also found to be the highest in proportions in their respective cohorts.

### **2.4.2 Multivariate Outcomes**

Results from the logit analysis are compiled in Table 2.3. Coefficients of logistic regression do not provide any meaningful interpretation unless accounted for

in the marginal effects, which estimates a marginal change on the probability of remitting<sup>4</sup>. The first column shows results from wave-1; the second column shows results from wave-2.

Females have a 7% higher probability of remitting than their male counterparts after six months of arrival. The probability of remittance does not alter with a longer stay (moving from wave-1 to wave-2) in the host country. Most of existing literature showed that males (if results are significant) tend to remit more than females. However, Craciun (2006), Connell & Brown (2004), and Osaki (2003) provided evidence that females tend to remit more than men and their estimation coefficients were significant. Connell & Brown (2004) argued that women are possibly more generous than men and hence, concluded that women are more *altruistic* compared to men. The probability of remitting increases monotonically by age category. Old-aged immigrants have an 8.5% higher likelihood of remitting compared to young immigrants. Clark and Drinkwater (2007: 727) found similar results for their study on immigrants from England and Wales; the remittance probability reached its peak where the average age of household was 52. Immigrants who arrived at an older age might be carrying more family responsibilities with their relocation when compared to a young immigrant. However, results for middle-aged immigrants were not significant. Results did not change as the immigrants stayed longer in Canada.

Economy class immigrants have an 11.3% less likelihood to remit compared to the family class, with that probability increasing as they stayed longer in Canada.

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<sup>4</sup> It is worth mentioning that probabilities are conditional (all other variables are set at their means).

This is not surprising since all immigrants under consideration came to Canada as permanent residents. Therefore economy class immigrants require spending more time to find better jobs and get settled than the family class immigrants for whom settlement is expected to be much easier. Hence a life with fewer struggles hastens a higher incidence of remittance for family class immigrants. Results for the other class of immigrants were found to be insignificant for both waves.

Immigrants from all other countries have a higher probability to remit when they are compared with the reference group of those from the Philippines (Table 2.3). Filipino immigrants scored highest among all SA immigrants when actual incidence of remittances was considered (please see Figure 2.1). Therefore the study attempts to explore how probability of remittance incidence varies when compared with this group. Surprisingly, an Indian has a 34.8% higher likelihood of remitting after six months of arrival compared to a Filipino immigrant. A plausible explanation is that an Indian immigrant might have stronger contractual obligations that might reinforce higher likelihood of remitting. *Self-interest* motivation might work strongly for Indian immigrants. However, to better understand the dynamics, pairwise probability decomposition is essential, but the LSIC survey data does not allow for such estimation due to residual disclosure issues. All results also portray that the country effect started to diminish as respondents moved into wave-2.

Respondents who live in smaller cities have a 7.2% less probability of remitting when compared with respondents who live in bigger cities. These probabilities decrease further for wave-2. Bigger cities offer better opportunities,

more community involvement, and better corridors for transferring money. Therefore it is expected that big city dwellers would have a higher probability to remit.

The evidence is surprising for the income group category. No significant trend is observed for wave-1 results. However, low wage earners have a higher tendency to remit: a 2.3% higher chance for income group < \$10,000 compared to the \$10,000-<\$25,000 group<sup>5</sup>, and a 7% less chance for the \$25,000-<\$50,000 group. The LSIC respondents were all permanent residents and it was expected they came to stay in Canada permanently. In general, it can be argued that higher income receivers might have more vested interests in Canadian life. Therefore this study hypothesizes that high income people would spend the major portion of their income inside Canada to enjoy Canadian life with their extended family members.

Wave-2 results also portray a similar picture. The probability of remittance diminishes for high-income immigrants, by 0.7 percentage points for the \$25,000-<\$50,000 group compared to the reference group. Probability decreases for the \$50,000-<\$70,000 group by 8.6 percentage points, and the coefficient is significant. Comparative results suggest that *contractual agreements* between migrants and their counterparts in the home country might not be enforced automatically for permanent settlers. Rather it might be the case that remittances are mostly driven by the motivation of *enlightened self-interest* of securing status and sponsoring family members for reunification to a completely new home. It should also be noted that some of the income coefficients in both waves are found to be insignificant which shows the existence of a large variation in the estimation.

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<sup>5</sup> This coefficient is not statistically significant.

Results for group activities and dwelling structure variables also support the *enlightened self-interest* idea. Respondents who are involved with at least one organization have a 6.1% less likelihood to remit as compared to no organizational involvement. Those who get involved to build their Canadian rapport tend to remit less<sup>6</sup>. The likelihood is even less as immigrants stay longer (wave-2) in Canada. Respondents who live in a rented place or any other arrangements are less likely to remit compared to those who live in a house with a mortgage. Those who live under rented or other arrangements could be struggling to settle compared to those living in a house.

The education variable shows that all categories (with any type of education) have a higher tendency to remit compared to those with no formal education. In both waves, probability starts to decline as years of education increase (up to the college level), but it starts to increase for those who have an education above college level. As all respondents have a tendency to settle in Canada, consequently results suggest the presence of the *enlightened self-interest* motivation to remit. Securing an inheritance or paying out education-related loans could drive immigrants to send more money back home. People living without children have a 11.9% higher chance to remit compared to people with children in wave-1, with a 12.1% higher chance in wave-2. The smaller structure of the family possibly diminishes the burden and increases the probability of remittance incidence and the probability increases as they stay longer in Canada.

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<sup>6</sup> One might also argue that a person with greater desire to remit might do less to build their Canadian rapport. However, as we take variables from different waves, potential bi-directional causality is expected to be minimum.

## 2.5 CONCLUSION

The results deviated from the conventional empirical findings for motivation to remit in a few cases, especially for income. It was found that higher income immigrants have less likelihood of remittances. This is perhaps due to the fact that as income increases, permanent residents spend more money inside Canada with their extended families. Therefore, the money flowing back is possibly due to either the *altruistic* motivation or the *enlightened self-interest* motivation. Results from the education variable also suggest the presence of *enlightened self-interest* motivation. It is also worth mentioning that results are reported taking marginal effects into account rather than reporting conventional odds ratio or coefficients. Therefore, some readers might be interested to learn about which independent variables are significant in determining likelihood of remittances. In order to get estimates for conditional probabilities one must estimate the logistic coefficients first. And for this study, significant (in terms of probability greater than t-statistics) determinants of likelihood of remittances are Sex, Income, Immigration category, Dwelling structure and Group involvement. Some previous studies (Houle and Schellenberg, 2008; Clrak and Drinkwater, 2007) also looked at amount of remittances as well as incidence of remittances. This issue is left for future research for various reasons. First of all, under reporting of amount might create a bias on the results, which requires further deeper inquiry to the dataset. Secondly, reduction of the bias might call for elimination of observations (or re-categorization of the variables) that might fail to meet the cutoff number set by STAT Canada to release any output. However, the

study opens up new avenues of regional research and policy-makers should consider regional variations for policy formulations.

Results are specific to the SA region and any generalization based on the estimation results is not expected. A complete model to determine motivations to remit (both holistic or motivation approach) demands information on both receivers and senders. As data is not available on the receiver's side, results should be interpreted with caution. Results may alter if an individual income response is replaced with a family income response. For the income variable, a large number of respondents are categorized as non-responders. The inclusion of those respondents calls for a sensitivity analysis that is left for future research. In addition, the size of remittances along with incidence should be considered for a better explanation of the model.



## **REFERENCES**

- Ataca, B. (2002). Psychological, socio-cultural, and marital adaptation of Turkish immigrant couples in Canada. *International Journal of Psychology*, 37(1), 13-26.
- Aykan, Z. & Berry, J.W. (1996). Impact of Employment-related Experiences on Immigrants' Psychological Wellbeing and Adaptation to Canada. *Canadian Journal of Behavioral Science*, 28(3).
- Baker, M. & Benjamin, D. (1995). The Receipt of Transfer Payments by Immigrants to Canada. *Journal of Human Resources*, 30(4), 650-67.
- Borjas, G.J. (1994). The Economics of Immigration. *Journal of Economic Literature*, 32(4), 1667-1717.
- Boyd, M. (1976). Immigration Policies and Trends: A Comparison of Canada and the United States. *Demography*, 13 (1), 83-104.
- Boyd, M. (2002). Educational Attainments of Immigrant Offspring: Success or Segmented Assimilation? *International Migration Review*, 36(4), 1037-60.
- Boyd, M. & Vickers, M. (2000). 100 Years of Immigration in Canada. *Canadian Social Trends*, 58.
- Carling, J. (2008). The Determinants of Migrant Remittances. *Oxford Review of Economic Policy*, 24(3), 582-99.
- Clark, K. & Drinkwater, S. (2007). An Investigation of Household Remittance Behavior: Evidence from the United Kingdom. *The Manchester School*, 75(6), 717-41.

- Connell, J., & Brown, R. (2004). *The Remittances of Migrant Tongan and Samoan Nurses from Australia*. Mimeo. University of Sydney.
- Craciun, C. (2006). *Migration and Remittances in the Republic of Moldova: Empirical Evidence at Micro Level*. Mimeo. Kiev: Economics, National University 'Kyiv-Mohyla Academy.
- Glytsos, N.P. (1997). Remitting Behavior of 'Temporary' and 'Permanent' Migrants: The Case of Greeks in Germany and Australia. *Labour*, 11(3), 409–35.
- Grant, M.L. (1999). Evidence of New Immigrant Assimilation in Canada. *Canadian Journal of Economics*, 32(4), 930-55.
- Green, W.H. (2003). *Econometric Analysis* (5<sup>th</sup> ed.). Prentice Hall, New Jersey.
- Green, A.G. & Green, D.A. (1995). Canadian Immigration Policy: The Effectiveness of The Point System and Other Instruments. *Canadian Journal of Economics*, 28(4b), 1006-41.
- Henry, F., Hastings, P. & Freer, B. (1996). Perceptions of Race and Crime in Ontario: Empirical Evidence from Toronto and The Durham Region. *Canadian Journal of Criminology*, 38(4), 469-76.
- Houle, R. & Schellenberg, G. (2008). Remittances Behaviour Among Recent Immigrants in Canada. *Analytical Studies Branch Research Paper Series*, Statistics Canada, Catalogue no. 11F0019M - No. 312.
- Johnson, G.E. & Whitelaw, W.E. (1974). Urban–Rural Income Transfers in Kenya: An Estimated Remittances Function. *Economic Development and Cultural Change*, 22(3), 473–79.

- Kazemipur, A. & Halli, S.S. (2001). Immigrants and New Poverty: The Case of Canada. *International Migration Review*, 35(4), 1129-56.
- Li, P.S. (1997). Self-employment Among Visible Minority Immigrants, White Immigrants, and Native-born Persons in Secondary and Tertiary Industries of Canada. *Canadian Journal of Regional Science*, 20(1-2), 103-17.
- Li, P.S. (2001). The Market Worth of Immigrants' Educational Credentials. *Canadian Public Policy*, 27.
- Li, P.S. (2003). Deconstructing Canada's Discourse of Immigrant Integration. *Journal of International Migration and Integration*, 4.
- Lucas, R.E.B. & Stark, O. (1985). Motivations to Remit: Evidence from Botswana. *Journal of Political Economy*, 93(5), 901-18.
- Menjívar, C., DaVanzo, J., Greenwell, L. & Burciaga Valdez, R. (1998). Remittance Behavior Among Salvadoran and Filipino Immigrants in Los Angeles. *International Migration Review*, 32(1), 97-126.
- Noh, S. & Avison, W.R. (1996). Asian Immigrants and the Stress Process: A Study of Koreans in Canada. *Journal of Health and Social Behavior*, 192-206.
- Noh, S., Beiser, M., Kasper, V., Hou, F. & Rummens, J. (1999). Perceived Racial Discrimination, Depression, and Coping: A Study of Southeast Asian Refugees in Canada. *Journal of Health and Social Behavior*, 40(3), 193-207.
- Osaki, K. (2003). Migrant Remittances in Thailand: Economic Necessity or Social Norm? *Journal of Population Research*, 20(2), 203-22.

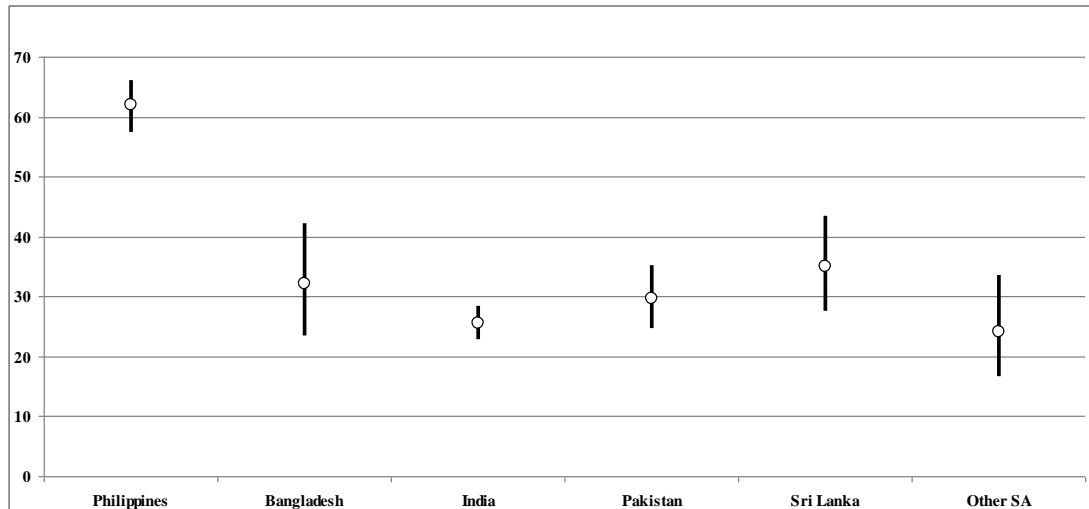
- Osili, U.O. (2007) Remittances and Savings from International Migration: Theory and Evidence Using a Matched Sample. *Journal of Development Economics*, 83(2), 446-65.
- Quddus, F. (2008). *Immigrant's Perception of the Legal System: A Qualitative Study of Bangladeshi Immigrants in Winnipeg, Manitoba*. MA thesis, Dafoe Library, University of Manitoba, Winnipeg.
- Reitz, J.G. (2001). Immigrant Skill Utilization in the Canadian Labour Market: Implications of Human Capital Research. *Journal of International Migration and Integration*, 2.
- Reitz, J.G. & Sklar, S.M. (1997). Culture, Race, and the Economic Assimilation of Immigrants. *Sociological Forum*, 12(2), 233-77.
- Richmond, A.H. (1992). Immigration and Structural Change: The Canadian Experience, 1971-1986. *International Migration Review*, 26 (4), 1200-21.
- Richmond, A.H. (2000). Immigration Policy and Research in Canada: Pure or Applied? *Journal of Ethnic and Migration Studies*, 26, 109-25.
- Roberts, J.V. & Doob, A.N. (1997). Race, Ethnicity, and Criminal Justice in Canada. *Crime and Justice*, 21, 459-522.
- Sana, M. & Massey, D.S. (2005). Household Composition, Family Migration, and Community Context: Migrant Remittances in Four Countries. *Social Science Quarterly*, 86(2), 509–28.
- Sander, C. (2003). *Migrant Remittances to Developing Countries: A Scoping Study Overview and Introduction to Issues for Pro-poor Financial Services*.

Prepared for the UK Department of International Development (DFID),  
Bannock Consulting.

- Shooshtari, S., Harvey, C.D.H., Furguson, E., Heinonen, T. & Khan, S. (2013). Effects of Remittance Behavior on the Lives of Recent Immigrants to Canada from the Philippines: A Population-Based Longitudinal Study. *Journal of Family and Economic Issues*, (DOI) 10.1007/s10834-013-9356-1.
- Statistics Canada (2005). *Longitudinal Survey of Immigrants to Canada*, Wave 3 – User Guide.
- Statistics Canada (2011). *Canada Year Book 2011*, Ottawa. Available at: <http://www.statcan.gc.ca/pub/11-402-x/2010000/chap/imm/imm-eng.htm>
- Thankom, A. & Hulya, U. (2011). Determinants of Remittances: The Case of the South Asian Community in Manchester. *Journal of Development Studies*, 47(6), 894-912.

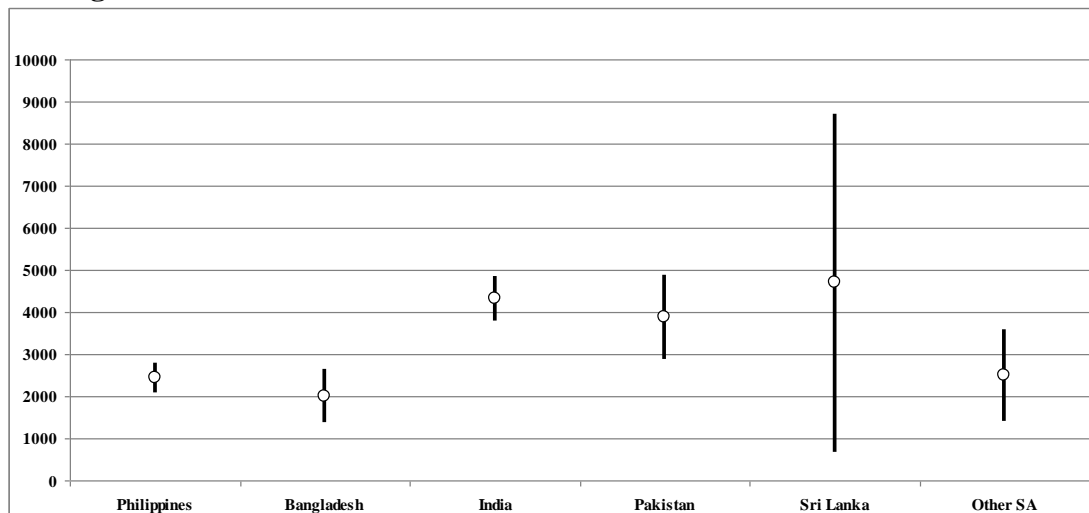
## APPENDIX

**Figure 2.1: Percentage of LSIC respondents who remitted two to four years after landing in Canada**



Data source: Statistics Canada (2005). Vertical lines represent confidence intervals.

**Figure 2.2: Average amount sent by SA immigrants after two to four years of landing in Canada**



Data source: Statistics Canada (2005). Vertical lines represent confidence intervals.

**Table 2.1: Univariate results of independent variables in wave-1**

<b>Variables</b>	<b>Categories</b>	<b>In %</b>
Sex	Male	50.95
	Female	49.05
Age	Young	54.51
	Middle Age	35.90
	Old	9.59
Marital Status	Single or Never Married	19.07
	Married or Common Law	77.52
	Other (widow, separated, etc.)	3.41
Immigration Status	Family Class	39.79
	Economic Class	56.89
	Other (including refugee)	3.32
Country of Origin	Philippines	23.26
	Bangladesh	5.37
	India	46.28
	Pakistan	14.09
	Sri Lanka	6.90
	Other South Asian Countries	4.10
City where Lived after Arrival	Major Cities (Toronto, Montreal or Vancouver)	75.91
	Other Cities	19.07
	Rural or Non-CMA or Not Mentioned	5.02
Income	< \$10,000	4.30
	\$10,000 to < \$25,000	15.63
	\$25,000 to < \$50,000	37.24
	\$50,000 to < \$70,000	17.66
	≥ \$70,000	12.96
	Not Reported	12.21
Employment Status	Employed	56.66
	Not Employed	43.34
Education Outside Canada	No Formal Education	2.41
	Trade Certificate or Other	26.83
	High School or Less	11.63
	College	39.94
	Undergraduate or Some University	16.87
	Graduate Study	2.31
Dwelling Structure	Owners with Mortgage	35.94
	Owners without Mortgage	2.63
	Renters	57.94
	Other Arrangement	2.21
	Valid Skip	1.28

**Table 2.1: Univariate results of independent variables in wave-1 (cont.)**

Involvement	No Group	78.19
in Group	One Group	19.24
Activities	More than One Group	2.57

Note: N=53,064.



**Table 2.2: Bivariate results between remittances in wave-3 vs. variables in wave-1**

<b>Variables</b>	<b>Categories</b>	<b>Remittance Sender</b>	<b>Remittance Non-sender</b>
<b>Socio-demographic Characteristics</b>			
Sex	Male	56.47	44.97
	Female	43.53	55.03
Age	Young	57.62	52.79
	Middle Age	35.36	36.20
	Old	7.02	11.01
Marital Status	Single or Never Married	19.96	18.58
	Married or Common Law	77.27	77.66
	Other (widow, separated, etc.)	2.77	3.76
Immigration Status	Family Class	32.43	43.85
	Economic Class	63.27	53.37
	Other (including refugee)	4.30	2.78
Country of Origin	Philippines	40.58	13.76
	Bangladesh	4.51	5.26
	India	33.05	53.07
	Pakistan	11.88	15.55
	Sri Lanka	6.84	6.98
	Other South Asian Countries	3.13	5.41
City where Lived after Arrival	Major Cities (Toronto, Montreal or Vancouver)	71.98	78.40
	Other Cities	22.12	16.97
	Rural or Non-CMA or Not Mentioned	5.90	4.63

**Table 2.2: Bivariate results between remittances in wave-3 vs. variables in wave-1 (cont.).**

Economic and Financial Endowment to Remit			
Income	< \$10,000	34.64	32.62
	\$10,000 to < \$25,000	36.58	31.32
	\$25,000 to < \$50,000	14.82	13.55
	\$50,000 to < \$70,000	1.94	2.78
	≥ \$70,000	1.48	1.21
	Not Reported	10.55	18.51
Employment Status	Employed	68.18	50.31
	Not Employed	31.82	49.69
Education Outside Canada	No Formal Education	1.56	2.88
	Trade Certificate or Other	3.17	1.83
	High School or Less	18.82	31.24
	College	14.24	10.20
	Undergraduate or Some University	46.98	36.07
	Graduate Study	15.22	17.78

**Table 2.2: Bivariate results between remittances in wave-3 vs. variables in wave-1 (cont.)**

Other Capacities/ Constraints to Remit			
Household Structure	With Children	44.36	54.43
	Without Children	48.72	38.69
	Not Reported	6.92	6.88
Dwelling Structure	Owners with Mortgage	13.92	20.93
	Owners without Mortgage	2.71	3.06
	Renters	69.27	64.75
	Other Arrangement	13.04	9.08
	Valid Skip	1.06	2.18
Involvement in Group Activities	No Group	73.06	81.01
	One Group	23.91	16.67
	More than One Group	3.03	2.32

Notes:

- 1) All results show column percentages of categories.
- 2) All results are significant at 5% level; 3) N=53,064.

**Table 2.3: Logit regression output**

<b>Dependent Variable: Remittance Incidence after Four Years of Arrival</b>			
<b>Independent Variables</b>	<b>Categories</b>	<b>Marginal Effect (Wave-1)</b>	<b>Marginal Effect (Wave-2)</b>
<b>Socio-demographic Characteristics</b>			
Sex	Male (reference group)		
	Female	0.074***	0.074***
Age	Young (reference group)		
	Middle Age	0.034	0.035
	Old	0.085**	0.085**
Marital Status	Single or Never Married (reference group)		
	Married or Common Law	0.004	-0.030
	Other (widow, separated, etc.)	-0.037	-0.038
Immigration Status	Family Class (reference group)		
	Economic Class	-0.113***	-0.116***
	Other (including refugee)	-0.070	-0.079
Country of Origin	Philippines (reference group)		
	Bangladesh	0.219***	0.195***
	India	0.348***	0.340***
	Pakistan	0.243***	0.223***
	Sri Lanka	0.125**	0.118**
	Other South Asian Countries	0.258***	0.247***

**Table 2.3: Logit regression output (cont.)**

City where Lived after Arrival	Major Cities (Toronto, Montreal or Vancouver) (reference group)		
	Other Cities	-0.072***	-0.079***
	Rural or Non-CMA or Not Mentioned	-0.071	-0.077
Economic and Financial Endowment to Remit			
Income	< \$10,000	0.023	0.098
	\$10,000 to < \$25,000 (reference group)		
	\$25,000 to < \$50,000	-0.070**	-0.069**
	\$50,000 to < \$70,000	0.003	-0.086**
	≥ \$70,000	-0.141*	-0.116***
	Not Reported	-0.083	-0.023
Employment Status	Employed	0.077***	0.077***
	Not Employed (reference group)		
Education Outside Canada	No Formal Education (reference group)		
	Trade Certificate or Other	0.168*	0.170*
	High School or Less	0.169***	0.171***
	College	0.125*	0.133*
	Undergraduate or Some University	0.142**	0.147**
	Graduate Study	0.169**	0.180**

**Table 2.3: Logit regression output (cont.)**

Other Capacities/ Constraints to Remit			
Household Structure	With Children (reference group)		
	Without Children	0.119***	0.121***
	Not Reported	-0.030	-0.027
Dwelling Structure	Owners with Mortgage (reference group)		
	Owners without Mortgage	0.004	0.098
	Renters	-0.094***	-0.045*
	Other Arrangement	-0.110**	-0.044
	Valid Skip	0.007	-0.008
Involvement in Group Activities	No Group (reference group)		
	One Group	-0.061**	-0.065**
	More than One Group	-0.052	-0.053

Notes:

1)\*, \*\*, \*\*\* indicate 10%, 5% and 1% levels of significance.

2) N=53,064.

## **CHAPTER 3**

# **COMPARATIVE EFFECTIVENESS OF NON-MARKET FINANCIAL FLOWS TOWARDS DEVELOPING COUNTRIES**

### ***3.1 INTRODUCTION***

External financial flows in the form of remittances and official development assistance (ODA) have long been viewed as key sources of economic growth for developing countries. For many years, developing countries have been receiving foreign aid in the form of concessional loans<sup>7</sup> and grants. The rapid integration of the globe has also made it possible for immigrants to send money to the host country at minimum cost. Hence remittances have become a strong non-market financial flow toward developing regions that complement other flows, including concessional loans and grants.

Despite massive foreign financial inflows of all forms, growth performance has varied significantly across developing countries. The lukewarm economic performance of many of these countries over the last 40 years has raised debate about the effectiveness of these financial flows, remittances and foreign aid on economic growth. Academic studies have found contradictory results. Pradhan, Upadhayay and

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<sup>7</sup> Concessional loans refer to the loans with maturities of over one year and fulfill all the Official Development Assistance (ODA) criteria with a promise of repayment. Grants are components of ODA with no obligation of repayment.

Upadhyaya (2008) and Aggarwal, Demirguc-Kunt and Martinez Peria (2006) provided evidence that remittances positively affect economic growth. In contrast, Chami, Fullenkamp and Jahjah (2005) found a negative association while Spatafora (2005) found no association between remittances and economic growth. The ODA-growth literature also revealed mixed outcomes. In their meta-study on 68 papers published before 2007, Doucouliagos and Paldam (2008, 2009) concluded that existing literature *sadly* failed to prove any statistically significant association between foreign aid and economic growth. In contrast, McGillivray et al. (2006) concluded that economic growth would be curtailed in the absence of foreign assistance for developing countries based on their survey of 50 years of previous empirical studies. Clearly, consensus among researchers regarding the linkage between external financial flows and economic growth has not been achieved thus far.

The reasons for perceived inconclusive results are mostly related to limited data availability, model specification bias (Hansen & Tarp, 2000; Doucouliagos & Paldam, 2008, 2009), and the failure to acknowledge the heterogeneous impact of different components of financial flows on economic growth (Loxley & Sackey, 2008). Developing countries receive concessional loans and grants under different conditions. Loans are given with a promise of repayment and are often used for debt servicing (Kenen, 1990). In contrast, remittances and grant-aid are transfers to developing countries without any expectation of repayment. Therefore differentiated treatment of these different inflows is warranted to study the effectiveness of financial flows on economic growth. Yet there is not much evidence in the literature of both



remittances and different components of ODA being examined simultaneously to compare the efficacy of these financial flows.

This paper attempts to fill in this gap in the literature by studying the comparative effectiveness of different types of external financial flows on economic growth. In order to investigate this, different types and components of financial flows - such as remittances, ODA, ODA-loans and ODA grants - are entered separately into a single economic growth equation. Individual impacts of disaggregated financial flows on economic growth are then measured, applying the first differenced Generalized Method of Moments (GMM) technique proposed by Arellano and Bond (1991). The GMM technique allows for the inclusion of a lagged dependent variable (GDP growth) within the dynamic framework, and also allows controlling for endogeneity that may arise through the interaction of dependent and explanatory variables.

In addition, this study also accommodates regional variation within the same framework while comparing the effectiveness of financial flows in a dynamic panel of 46 developing countries of the world (see Table 3.1 for the list of the countries).

The existing literature is discussed in section 3.2. The theoretical and empirical methodology used, along with a brief description of data, is presented in section 3.3. Section 3.4 analyzes the findings, followed by concluding remarks in the last section.

### ***3.2 LITERATURE REVIEW***

The seminal paper by Chenery and Strout (1966) was considered to be the workhorse study that provided a theoretical two-gap model to explain the importance

of foreign aid. According to the study, developing countries could eliminate savings and foreign exchange constraints with the support of foreign aid. Attenuation of these two constraints did significantly boost investment and the ability to import the most needed intermediate goods, which eventually lead to higher growth rates. However, many opposed this view on the grounds that aid would be less effective if it was utilized as a substitute for domestic savings. If foreign aid was used for increasing consumption in lieu of increasing investment, it would be insufficient to reduce those gaps (Griffin & Enos, 1970; Weisskopf, 1972). Empirical studies that investigated the aid-savings-growth relationship were indecisive. Hansen and Tarp (2000: 381) reviewed 64 regressions from different studies that estimated the aid-savings-growth relationship. Of these, 38 regressions revealed a positive relationship, 25 revealed an insignificant relationship, and only one study revealed a negative relationship between aid, savings and growth.

The second generation of models evolved to examine the aid-investment-growth relationship as opposed to exploring the aid-savings-growth relationship. However, empirical research based on second-generation models also demonstrated inconclusive results, irrespective of panel or time series estimations. For second-generation models, Hansen and Tarp (2000) conducted a similar review to compare results from prior studies. Out of 72 studies they reviewed, 40 studies demonstrated a positive relationship between foreign aid and economic growth while 31 studies exhibited insignificant results. One study revealed that aid impacts economic growth negatively. However, out of those 31 insignificant estimations, at least 12 studies further failed to provide any evidence that savings help to generate economic growth.

Since most of these studies provided results in support of aid effectiveness, Hansen and Tarp concluded that aid *spurred* economic growth in developing countries (2000: 385).

Among other studies not reviewed by Hansen and Tarp, Gounder (2001) found a strong positive relationship between all types of aid and economic growth in Fiji. Asteriou (2009) provided evidence of a positive association between aid and growth for South Asian countries. However, using a somewhat different data set, Arellano et al. (2009) argued the positive and significant relationship became weak or insignificant when aid was utilized for debt servicing or consumption. Rajan and Subramanian (2005) provided various channels through which aid could deter economic growth. Based on various estimation methods (OLS and Instrument Variable (IV) regressions), the authors argued that aid would be detrimental for economic growth if channeled into non-productive public spending, and it could also reduce the competitiveness of the traded goods sector through exchange rate overvaluation - a concept similar to the *Dutch Disease* effect. As well, Rajan and Subramanian (2008) investigated potential reasons behind the presence of mixed results. Their study concluded that mixed results could be attributed to model misspecification, the limited availability of data that reduced degrees of freedom, and a failure to acknowledge the potential endogeneity within the framework.

A third generation of models also evolved over the last 15 years. Overcoming many of the caveats of previous generation studies are the main contributions of these models. This was achieved by exploiting longer data series in panel studies, including measurements of economic policy and institutional environments, correcting for the

endogeneity-related bias in the aid-growth relation, and acknowledging the non-linearity of the aid-growth relationship (Hansen & Tarp, 2000). For this type of model, Burnside and Dollar (1997) found strong positive impacts of aid in developing countries under good fiscal, monetary and trade policies. However, Easterly, Levine & Roodman (2003), with updated data set incorporating additional years and filling in missing data from Burnside & Dollar (1997), found no robust relationship between aid and growth under good policy environments. Thus, the authors concluded that their study raises new doubts about any definite conclusion that was claimed by Burnside and Dollar (1997). A number of other studies also provided evidence that even in countries with good policies, a significant and robust relationship between aid and growth was absent (Hansen & Tarp, 2001; Rajan & Subramanian, 2005).

Another set of studies attempted to explore the aid-growth relationship by inserting disaggregated components of aid flows in the growth equation. Aid has two major components: concessional loans and grants. For these two components, conditions of repayments and utilization process also vary. Therefore, aid-growth results are expected to be more apposite when disaggregated ODA is taken into consideration. Loxley and Sackey (2008) found that both grant-aid and concessional loans were effective for economic growth in Africa. However, concessional loans were found to be less effective than grants. Morrissey, Iseli and Manja (2006) also found similar results, suggesting that grants are associated positively but loans are associated negatively with the long-run growth of poor countries. Using disaggregated aid data, Minoiu and Reddy (2010) found that a positive, large and

robust growth effect was only associated with development aid<sup>8</sup>. In contrast, non-development aid was found to be growth neutral and, as Minoiu and Reddy found, often detrimental to economic growth. Morrissey, Iseli and Manja (2006) used disaggregated ODA data for 55 low and middle income countries and concluded that ODA-loans had negative impacts and ODA-grants had positive impacts on the long-run economic growth of these countries. Similar results were also evident in Das and Khan (2012) and Doucouliagos and Paldam (2008, 2009).

Empirical research also provided mixed results on the effects of remittances on economic growth. On the positive side, remittance flows can be treated as an additional source of financing that can help reduce budget constraints. On the negative side, a large flight of human capital, which has generated remittances, can possibly deter the growth potential of the country, depending on the skill of the labour and the unemployment rate. The impact would largely be affected by the nature of migration (permanent vs. temporary), the rate of unemployment (high or low) and the country of immigration<sup>9</sup>. The conventional perception of the remittances/growth relationship is that remittances serve as an important source of investment and therefore positively affect economic growth. A widely accepted view is that remittances, as mostly driven by *altruistic* motivations, help to enhance human capital accumulation through increased investment in the healthcare and education sector. The effect of remittances on economic growth via enhanced human capital is difficult to estimate as human capital enhancement could take a long period to be realized.

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<sup>8</sup> Development aid data is constructed by pooling multilateral aid (all) and bilateral aid provided by countries with good standing according to the aid-quality donor rankings. Non-developmental aid is the residue of total aid and developmental aid.

<sup>9</sup> A detailed analysis is presented in Carling (2008).

Therefore, finding an appropriate lag would be cumbersome for any growth estimations (Cox and Ureta, 2003). However, growth estimations were widely used to capture the more instantaneous effect of remittances on physical capital accumulation (e.g. construction of a new house) and its further impact on economic growth. In contrast, remittances could become less productive in generating growth if they reduce work effort or are used mostly for consumption purposes (Chami, Fullenkamp & Jahjah, 2005).

Pradhan et al. (2008) conducted their study on 36 countries and found a small positive impact of remittances on economic growth. Ziesmer (2006) provided evidence in favour of remittances as growth enhancing for developing countries. The IMF (2005) and World Bank (2006) also found a positive relationship between remittances and economic growth. Remittances can also help improve the financial intermediation process of an economy and can have an indirect positive impact on economic growth. Scaling up of remittance-related activities promotes increased aggregate level of deposits and credit intermediation by the local banking sector and thus facilitates the economic growth process of developing countries. Aggarwal et al. (2006) and Giuliano and Ruiz-Arranz (2009) investigated the indirect impact of remittances through financial market development and found a strong positive relationship between remittances and financial development and remittances and economic growth, respectively. Aggarwal et al. (2006) found that remittance helped to increase financial intermediation and worked as a complementary financial flow towards development of the banking sector. Financial development is measured either by the ratio of bank credit to the private sector or the share of bank deposits expressed

as a percentage of GDP. Giuliano and Ruiz-Arranz (2009), in contrast, found a substitution type effect of remittances on financial development. The authors showed that remittance works better in less financially developed countries to promote economic growth. Financial agents utilize remittances to compensate for the less developed financial market by using remittances to ease liquidity constraints and channeling remittances towards growth enhancing activities. The study adopted liquid liabilities of the financial system ( $M2/GDP$ ), the sum of demand, time, saving and foreign currency deposits to GDP, and credit provided by the banking sector to GDP to account for financial developments. On the contrary, Lopez, Molina and Bussolo (2007) and Lartey, Mandelman and Acosta (2008) revealed a negative relationship between remittances and growth. This negative result is due to the *Dutch Disease* effect. A voluminous inflow of remittances can put enormous strain on the exchange rate and eventually lead to appreciation, which could have a negative impact on the growth performance of a country by discouraging exports and encouraging expansion of the not-tradable goods sector.

In recent years, academic studies have begun to model both remittances and foreign aid within a single framework to explore non-market financial flows and the economic growth relationship. Ziesmer (2006) explored the impact of both remittances and ODA on growth. Using a first generation type model, the study showed that remittances affected GDP growth through increased savings for countries with less than \$1,200 GDP per capita. For richer countries, the effect of remittances began to diminish. However, the study did not find any significant aid potency in their estimation, thus suggesting a reduction in aid dependence. The study considered

total ODA rather than disaggregated ODA, and also differs in terms of technique and model specifications from this present study. Ziesmer's growth accounting approach evolved from the first generation two-gap model, where the main channel was savings, using the GMM estimation procedure. The second generation reduced form Solow type model is used in this present study. Moreover, different components of foreign aid (disaggregated aid) are introduced separately within the same modeling framework to explore the comparative effectiveness of these flows.

It is evident from the above discussion that empirical results regarding the aid-growth nexus and remittance-growth nexus were mixed and ambiguous. This could be attributed to model misspecification, data limitations<sup>10</sup> or the existence of endogeneity within the model (Rajan & Subramanian, 2008). However, inconclusive results are the main motivation of this paper. To contribute to the prevailing controversy, the study attempts to accommodate all of the caveats discussed above. This study uses the first differenced GMM estimation procedure, as suggested by Arellano and Bond (1991), to control for endogeneity within the model. It also uses disaggregated aid data to capture the differential impact of aid components on economic growth. Finally, the study attempts to ensure the best usage of the longest available data coverage to capture the true variability across countries.

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<sup>10</sup> It is worth mentioning that different studies used different time periods and different set of countries which made it even more difficult to compare across studies.



### 3.3 METHODOLOGY

#### 3.3.1 Data and Model Specification

The model uses a modified version of the neoclassical growth equation (Solow, 1956). The first equation (equation 1) examines the role of concessional loans on GDP growth, where GDP growth ( $g_Y$ ) is primarily determined by investment ( $inv$ ) and the growth in labour force ( $g_L$ ). It is well established in the existing literature that the output series is often persistent (Alesina et al., 1996; Bond, Hoeffler & Temple, 2001). Thus the current year's growth can be influenced by last year's growth. To accommodate the persistence characteristic of this variable, lagged GDP growth ( $g_{Y-1}$ ) is included as an independent variable. Growth in concessional loans ( $g_{LOAN}$ ), growth in grants ( $g_{GRANTS}$ ), and growth in remittances ( $g_{REM}$ ) are included in the model to estimate their effect on output growth. Finally, growth in other external flows ( $g_{OEFLOAN}$  /  $g_{GRANTS}$ ) (either all other external flows but concessional loans, or all other external flows but grants) is included to avoid any bias that may arise from the problem of omitted variables.

$$g_Y = f(g_{Y-1}, inv, g_L, g_{REM}, g_{LOAN}, g_{OEFLOAN}) \quad (1)$$

Concessional loans are replaced by grant-aid ( $g_{GRANTS}$ ) and other external flows but concessional loans ( $g_{OEFLOAN}$ ) are replaced by  $g_{OEFGRANTS}$  (all other external flows but grant-aid) in equation 2 to identify their growth effect. Finally, equation 3 is used to identify the effect of aggregate ODA (that includes both loans and grants) on economic growth. Growth in ODA ( $g_{ODA}$ ) is used instead of  $g_{LOAN}$  or  $g_{GRANTS}$ . All other external flows but ODA are represented as  $g_{OEFODA}$ .

$$g_Y = f(g_{Y-1}, inv, g_L, g_{REM}, g_{GRANTS}, g_{OEFGRANTS}) \quad (2)$$

$$g_Y = f(g_{Y-1}, inv, g_L, g_{REM}, g_{ODA}, g_{OEFODA}) \quad (3)$$

Models specified in equations 1, 2 and 3 are estimated using panel data covering 46 countries for the period of 1979 to 2009. In the above equations, investment is defined as the growth of capital formation<sup>11</sup>. Other external flows (related to loans, grants and ODA) are calculated by deducting the particular variable in consideration from total aid receipts. All financial flow variables are measured in US dollars and adjusted for price level changes prior to measuring growth, following Das and Khan (2012). After calculating the growth of all variables, growth rates, which were higher than 500% (either positive or negative)<sup>12</sup>, were excluded and treated as outliers. It is the expectation that the omission of a few data points would not affect the pooled data set since a longer time series panel was employed. As data on labour force growth is not available for most developing countries, a proxy of this variable is used by computing the number of people belonging to the age group of 15 to 64 years old (based on Das & Khan, 2012). Model specification remains the same to estimate the discernible effects in different regions: Africa, Latin America and Asia.

Remittance (Personal remittances received), investment, working age population, and output data were collected from World Development Indicators and UN data published by the World Bank and United Nations respectively. Data on ODA, loans, grants and other external flows were acquired from the OECD statistical database.

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<sup>11</sup> Investment refers to growth of gross capital stock.

<sup>12</sup> For instance, Belize and Botswana had growth of ODA that exceeds the bound for 1999 and 2008 respectively. There are 17 data points omitted in total. All growth variables are expressed in terms of rates (for example 0.12) as opposed to percentages (for example 1.2%).

### 3.3.2 Testing for Stationarity

Macroeconomic time series variables often possess a unit-root process (Nelson & Plosser, 1982). Non-stationary variables in a regression model can produce spurious regression results if not treated for unit-root corrections<sup>13</sup>. As the Maddala and Wu (1999) test does not require a balanced panel, this test is used to identify the level of integration of the time series variables. Results (presented in Table 3.2) indicate that the null hypothesis of unit root for all variables was strongly rejected at the 1% level, except for labour growth. For Solow type growth accounting, a number of prevailing studies used school enrollment to account for human capital accumulation (Barro & Lee, 2010). However, school enrollment data is only suitable for five-year averaged regression analysis due to the unavailability of yearly information. For longer time series data, studies have used economically active populations as a proxy. Das and Paul (2011) argued that the regression coefficient of labour variable often showed insignificant results as labour time is substituted by the economically active population. A person belonging to the economically active age cohort does not fully reflect his/her participation in the labour force. Based on the results from unit root tests, this study proceeded with the first-differenced GMM approach to examine the growth effect of foreign financial flows. There are several other reasons why the GMM technique is the most appropriate estimation procedure for this purpose. First, estimation using pooled cross-section and time series data allow the researcher to use more data points, and thus exploit the time series characteristic of the relationships. Second, the GMM procedure controls for country-

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<sup>13</sup> Solow type regression models often use investment to GDP ratio as opposed to level of investment. As the investment to GDP ratio is found to exhibit non-stationary process, we choose to use the level instead.

specific effects, which otherwise become part of the error term. Finally, the potential endogeneity can be captured that may arise from all explanatory variables (Baum, Schaffer & Stillman, 2003; Wooldridge, 2002).

### 3.3.3 First Differenced GMM

Consider the following  $AR(1)$  model with unobserved country-specific effects:

$$y_{i,t} = \alpha y_{i,t-1} + X_{i,t} + \zeta_i + \tau_{i,t} \quad (4)$$

Where  $i = 1, 2, \dots, N$  and  $t = 2, \dots, T$ .  $\zeta_i$  is the component for the time invariant country-specific effect and  $\tau_{i,t}$  is the time variant component, where  $\varepsilon_{i,t} = \zeta_i + \tau_{i,t}$  has the standard error component structure,

$$E[\zeta_i] = 0, E[\tau_{i,t}] = 0, \text{ and } E[\zeta_i \tau_{i,t}] = 0 \quad (5)$$

The GMM dynamic panel estimator makes two assumptions. (i) Transient errors are serially uncorrelated.

$$E[\tau_{i,t} \tau_{i,s}] = 0 \text{ for } i = 1, 2, \dots, N \text{ and } s \neq t \quad (6)$$

And (ii) the explanatory variables are not correlated with future realizations of the error term.

$$E[y_{i,t} \tau_{i,s}] = 0 \text{ for } i = 1, 2, \dots, N \text{ and } t = 2, \dots, T \quad (7)$$

Under assumptions (6) and (7), we have the following moment conditions:

$$E[y_{i,t-s} \Delta \tau_{i,t}] = 0 \text{ for } t = 3, \dots, T \text{ and } s \geq 2, \dots, (T - 1) \quad (8)$$

These are the moment restrictions exploited by the standard linear first-differenced GMM estimator. This procedure thus allows the researcher to use the lagged levels dated  $t-2$  and earlier as instruments (Bond et al., 2001).

### **3.4 RESULTS**

Tables 3.3A to 3.3D provide estimation results for all 46 countries, Africa, Latin America and Asia respectively. The first column in each table presents variables in consideration. The second column estimates equation 3, where the total growth of ODA is reported along with the growth of remittances and other financial flows (except ODA). The third column estimates equation 1, i.e., effect of growth of ODA-loan and other financial flows (except loan) on GDP growth. The fourth column estimates equation 2, the effect of the growth of ODA-grants and other flows on the growth of GDP. Remittances are common in all three equations. In all these tables, the number of countries (groups), total number of observations, and the Hansen *J-statistics* of over-identification test results are also displayed at the bottom. GDP growth is instrumented by lag of growth, lag of investment, lag of food production growth and lag of financial flows. Hansen *J-statistics* for all estimations reveals the instruments are valid and exogenous.

Lagged growth is found to be highly significant (at the 1% level) for all countries and regions except Asia. Magnitudes of the significant coefficients vary from 0.25 to 0.33. In other words, a 1 percentage point change in the previous year's growth would bring about a 0.25 percentage point to 0.33 percentage point growth in the current year. These results support the persistence hypothesis of output growth suggested by Alesina et al. (1996). Investment is also found to be strongly associated with growth for all regions. Working age population growth in all equations presents no significant results in terms of either sign or magnitude.

For all 46 countries (Table 3.3A) remittances reveal robust results for all equations. Table 3.3A shows that a 1 percentage point growth in remittances would affect the growth of GDP by 0.036 percentage points in the ODA equation<sup>14</sup>. ODA is also found to be positively affecting growth. However, the magnitude for ODA and all other flows are smaller than remittances for all three equations. Growth in concessional loans (equation 1) is found to be insignificant, suggesting that the growth rate of GDP might not be associated with growth in concessional loans. All these financial flows can affect GDP growth through two channels. Part of these flows would affect growth through enhanced investment<sup>15</sup> and part of these flows would affect thorough productivity growth (spillover effect). As the study is not assuming that all of these flows would be invested fully, insignificant coefficient of the loan variable could not be attributed to the fact that all loans were fully internalized through investment. In order to investigate the internalization process, a separate set of regressions based on investment and consumption equation is essential which is beyond the scope of this study. Growth in other flows is positive and significant only at the 10% level. However, the magnitude is nearly close to zero for concessional loans and other flows in equation 1. In equation 3, the effect of growth in grant-aid on economic growth is examined. The coefficient for grant-aid is 0.018. This variable is significant at the 5% level and insensitive to any change in the specification. On average, one unit of increase in grant growth increases the GDP growth rate by 0.018 units over the period of 1979 to 2011. Growth of all other

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<sup>14</sup> In other words, doubling of the existing growth of remittances would bring about 3.6% growth in GDP.

<sup>15</sup> The study adopted the assumption that part of these flows will be consumed instead of invested fully.

external flows but grant-aid is significant at the 1% level. However, the coefficient is smaller than grants growth, suggesting that the growth impact on GDP is mainly due to the growth in remittances and grants.

The Africa region reveals similar results with little change in magnitude and level of significance. The remittances coefficient is quite similar to that of all countries. However, remittances in Africa are found to be less significant than elsewhere. Remittances for all countries are significant at the less than 1% level while for Africa, they are significant at levels of 5 % or 10 %. Grant-aid is positive and significant at the 10% level. This low level of significance is expected, as many Sub-Saharan African (SSA) countries are excluded due to lack of data on remittances. For a larger set of African countries, prevailing literature found strong and positive associations between grant-aid and GDP growth. For instance, the study excluded countries like Tanzania, Central African Republic and Malawi from the model. Exclusion of these heavily aid dependent, especially grant-aid dependent countries, would probably produce a downward bias on outcomes. On a different set of SSA countries, Das and Khan (2012) found a much larger impact of grant-aid on growth.

Results for Latin America reveal a similar pattern to that of Africa. GDP growth is positively and significantly affected by remittance growth, grant-aid growth and overall ODA growth. A 1 percentage point increase in remittance growth, grant-aid growth, and ODA growth would bring about a 0.037, 0.018 and 0.25 percentage point change in growth of GDP respectively. ODA-loans are found to be insignificant for this region as well.

Results for Asia reveal that the coefficient of remittance is the largest for this region. A 1 percentage point change in remittance growth would bring about a 0.046 percentage point to 0.057 percentage point growth in GDP. Remittances are also significant at the 1% level. Estimation results show that both loans and grants are insignificant for this region. However, other flows except grants (*OEFGGRANTS*) show a larger magnitude compared to other estimations and are significant at the 5% level. This is perhaps due to the fact that other flows, such as private portfolio investments, loans made by banks and export credits, work better and are more significant in this region.

From the above discussion, it is clear that remittances work positively and efficiently irrespective of region or model specifications out of all types of financial flows towards developing countries. Table 3.4 provides a summary of key variables in terms of their sign and magnitude. It is evident from the table that the ODA-loan is insignificantly associated with GDP growth for all equations and regions. This is perhaps due to the fact that the future debt-servicing obligation imposes a limit on the efficient utilization of loans. Rather, the positive and significant impact of remittances and grants suggest that '*transfer*' type inflows, with no obligation of repayment, work better for all these countries. This conclusion is also supported by Loxley and Sackey (2008) and Das and Khan (2012).

### ***3.5 CONCLUSION***

This study attempted to answer the question of which components of external financial flows were significantly associated with economic growth. Disaggregated



data of external financial flows were used to answer this question by applying the GMM technique over 46 developing countries for the period of 1979 to 2011.

The results suggested that out of all different financial flows, remittances are the key channel to achieve higher economic growth. Grants are found to be the second largest significant financial flow that works positively towards achieving higher economic growth. The underlying reason is the efficient utilization of these flows that enter developing countries without any obligation of repayment. For the same reason of amortization obligation, loans are insignificantly associated with economic growth. The study also attempted to correct for some of the caveats applicable to previous studies regarding model specifications and endogeneity. To that end, the study accommodates the persistence nature of output growth by incorporating lagged GDP growth into the estimation and modeling with appropriate instruments.

Some of the variables in different estimated equations are found to be statistically insignificant. Working age population growth is used to proxy labor force growth and the coefficients for this variable are found to be insignificant for most of the cases. Therefore, results should be interpreted with some caution. There are other types of growth equations which have been used by different studies. A comparative study, using different variants of growth accounting, including different measures of economic performance, could be interesting to address the research question in a broader perspective. This exercise is left for future research.

Solow type growth accounting often incorporates initial income on the grounds that a negative sign of the coefficient provides evidence of movement

towards a steady state. Convergence and steady state analysis is left for future research. The long-run and short-run dynamics of these key variables invite further enquiry. Although analyses have been conducted to capture regional variation, it would be interesting to compare estimations accounted for income variations. Different income groups could behave differently in terms of utilizing external financial resources to achieve higher economic growth. Answers to these questions are important but are left for future research.

## **REFERENCES**

- Aggarwal, R., Demirguc-Kunt, A. & Martinez Peria, M.S. (2006). Do Workers' Remittances Promote Financial Development? *World Bank Policy Research Working Paper*, No. 3957.
- Alesina, A., Özler, S., Roubini, N. & Swagel, P. (1996). Political Instability and Economic Growth. *Journal of Economic Growth*, 1(2), 189-211.
- Arellano, C., Bulir, A., Timothy, D. & Lipschitz, L. (2009). The Dynamic Implications of Foreign Aid and Its Variability. *Journal of Development Economics*, 88(1), 87-102.
- Arellano, M. & Bond, S. (1991). Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. *Review of Economic Studies*, 58(2), 277-97.
- Asteriou, D. (2009). Foreign Aid and Economic Growth: New Evidence from a Panel Data Approach for Five South Asian Countries. *Journal of Policy Modeling*, 31(1), 155-61.
- Baum, C.F., Schaffer, M.E. & Stillman, S. (2003). Instrumental Variables and GMM: Estimation and Testing. *The Stata Journal*, 3(1), 1-31. Unpublished working paper version: Boston College Department of Economics Working Paper No. 545. <http://fmwww.bc.edu/ec-p/WP545.pdf>
- Barro, R. & Lee, J. (2010). A New Data Set of Educational Attainment in the World, 1950-2010. *NBER Working paper*, No. 15902.
- Bond, S., Hoeffler, A. & Temple, J. (2001). GMM Estimation of Empirical Growth Model. *CEPR Discussion Paper*. No. 3048.

- Burnside, C. & Dollar, D. (1997). Aid, Policies and Growth. *Policy Research Working Papers 1777*, World Bank: Washington, DC.
- Carling, J. (2008). The Determinants of Migrant Remittances. *Oxford Review of Economic Policy*, 24(3), 582-99.
- Chami, R., Fullenkamp, C. & Jahjah, S. (2005). Are Immigrant Remittance Flows a Source of Capital for Development? *IMF Staff Papers*, 52(1), Washington, DC: IMF.
- Chenery, H.B. & Strout, A.M. (1966). Foreign Assistance and Economic Development. *American Economic Review*, 56, 679-733.
- Cox, E. A., & Ureta, M. (2003). International Migration, Remittances, and Schooling: Evidence from El Salvador. *Journal of Development Economics*, 72, 429–61.
- Das, A. & Khan, S. (2012). Is Grant-Aid More Effective than Concessional Loans? Evidence from a Dynamic Panel of Sub-Saharan African Countries. *International Journal of Economics and Finance*, 4(1), 14-21.
- Das, A. & Paul, B. (2011). Openness and growth in emerging Asian economies: Evidence from GMM estimations of a dynamic panel. *Economics Bulletin*, 31(3), 2219-2228.
- Doucouliafos, H. & Paldam, M. (2008). Aid Effectiveness on Growth: A Meta Study. *European Journal of Political Economy*, 24, 1-24.
- Doucouliafos, H. & Paldam, M. (2009). The Aid Effectiveness Literature: The Sad Results of 40 Years of Research. *Journal of Economic Surveys*, 23(3), 433-61.

- Easterly, W., Levine, R. & Roodman, D. (2003). New Data, New Doubts: A Comment on Burnside and Dollar's 'Aid, Policies, and Growth'. *NBER Working Paper Series*.
- Giuliano, P. & Ruiz-Arranz, M. (2009). Remittances, Financial Development, and Growth. *Journal of Development Economics*, 90 (1), 144–52.
- Gounder, R. (2001). Aid-growth Nexus: Empirical Evidence from Fiji. *Applied Economics*, 33(8), 1009-19.
- Griffin, K.B. & Enos, J.L. (1970). Foreign Assistance: Objectives and Consequences. *Economic Development and Cultural Change*, 18(3), 313-27.
- Hansen, H. & Tarp, F. (2000). Policy Arena: Aid Effectiveness Disputed. *Journal of International Development*, 12, 375-398.
- Hansen, H. & Tarp, F. (2001). Aid and Growth Regressions. *Journal of Development Economics*, 64, 547-70.
- International Monetary Fund (IMF) (2005). Two Current Issues Facing Developing Countries. *World Economic Outlook*, April 2005: Globalization and External Imbalances. World Economic and Financial Surveys, Washington.
- Kenen, P.B. (1990). Organizing Debt Relief: The Need for a New Institution. *The Journal of Economic Perspectives*, 4(1), 7-18.
- Lartey, E., Mandelman, F. & Acosta, P. (2008). Remittances, Exchange Rate Regimes, and the Dutch Disease: A Panel Data Analysis. *Federal Reserve Bank of Atlanta Working Paper*, 2008-12.
- Lopez, H., Molina, L. & Bussolo, M. (2007). Remittances and Real Exchange Rate. *World Bank Policy Research Working Paper*, 4213. Washington: D.C.

- Loxley, J. & Sackey, H. (2008). Aid Effectiveness in Africa. *African Development Review*, 20(2), 163-199.
- McGillivray, M., Feeny, S., Hermes, N. & Lensink, R. (2006). Controversies Over the Impact of Development Aid: It Works; It Doesn't; It Can, But That Depends. *Journal of International Development*, 18 (7), 1031-50.
- Minoiu, C. & Reddy, S.G. (2010). Development Aid and Economic Growth: A Positive Long-run Relation. *The Quarterly Review of Economics and Finance*, 50(1), 27-39.
- Morrissey, O., Iseli, O. & Manja, D. (2006). Aid Loans versus Aid Grants: Are the Effects Different? *CREDIT Research Paper*, University of Nottingham, No. 06/07.
- Nelson, C. & Plosser, C. (1982). Trends and Random Walks in Macro Economic Time Series: Some Evidence and Implications. *Journal of Monetary Economics*, 10, 130–62.
- Pradhan, G., Upadhyay, M. & Upadhyaya, K. (2008). Remittances and Economic Growth in Developing Countries. *European Journal of Development Research*, 20(3), 497–506.
- Rajan, R.G. & Subramanian, A. (2005). What Undermines Aid's Impact on Growth? *IMF Working Paper*, WP/05/126.
- Rajan, R.G. & Subramanian, A. (2008). Aid and Growth: What Does the Cross-Country Evidence Really Show? *The Review of Economics and Statistics*. 90(4), 643-665.

- Solow, R.M. (1956). A Contribution to the Theory of Economic Growth. *Quarterly Journal of Economics*, 70(1), 65-94.
- Spatafora, N. (2005). Two Current Issues Facing Developing Countries. *World Economic Outlook*, International Monetary Fund, Washington, DC.
- Weisskopf, T.E. (1972). The Impact of Foreign Capital Inflow on Domestic Savings in Underdeveloped Countries. *Journal of International Economics*, 2, 25-38.
- Wooldridge, J.M. (2002). *Econometric Analysis of Cross Section and Panel Data*. Cambridge, MA: MIT Press.
- World Bank. (2006). *The Development Impact of Workers' Remittances in Latin America*, Vol.2: Detailed Findings. (Chapter 3, Section V), Report No. 37026 (Washington).
- Ziesmer, T. (2006). Worker Remittances and Growth: The Physical and Human Capital Channel. *UNU-Merit Working Paper Series*, 020, United Nations University.

## ***APPENDIX***

**Table 3.1: List of countries**

<b>Middle East and Africa</b>		<b>Latin America</b>	<b>Asia</b>
Algeria	Madagascar	Belize	Bangladesh
Benin	Mali	Bolivia	Fiji
Botswana	Morocco	Colombia	India
Burkina Faso	Mozambique	Costa Rica	Pakistan
Cameroon	Niger	Dominican Republic	Papua New Guinea
Cape Verde	Nigeria	El Salvador	Philippines
Cote d'Ivoire	Rwanda	Guatemala	Sri Lanka
Egypt, Arab Rep.	Senegal	Honduras	Thailand
Gabon	Sudan	Mexico	
Ghana	Swaziland	Panama	
Jordan	Syrian Arab Republic	Paraguay	
Kenya	Togo		
Lesotho	Tunisia		

Note: Turkey, being the single country from the European region, is taken only into the world regression.



**Table 3.2: Results from Fisher Type Stationarity Tests Proposed by Maddala and Wu (1999)**

Variables	Test statistics <sup>a</sup>				Determination
	All countries	Asia	Africa	Latin America	
gY	613.06***	105.36***	398.03***	109.67***	Strongly Stationary
inv	1010.84***	152.59***	659.29***	198.96***	Strongly Stationary
gL	218.48***	6.86	192.03***	19.60	Strongly Stationary <sup>b</sup>
gREM	1143.77***	182.27***	598.00***	363.49***	Strongly Stationary
gODA	1405.67***	269.42***	724.43***	411.82***	Strongly Stationary
gOEFODA	1035.82***	189.58***	555.72***	290.52***	Strongly Stationary
gLOAN	1070.58***	226.01***	577.66***	411.82***	Strongly Stationary
gOEFLOAN	1515.11***	262.39***	37.16***	315.56***	Strongly Stationary
gGRANTS	1502.38***	326.11***	797.48***	378.79***	Strongly Stationary
gOEFGRANT	965.51***	205.93***	516.71***	242.86***	Strongly Stationary
S					

Notes:

a) Null Hypothesis: Panel contains unit roots. \*\*\* implies significance at the 1% level.

b) Labour variable is found to have unit roots for Asia and Latin America regions.

**Table 3.3A: Effects of Remittance, ODA, ODA loans (net), ODA Grants on GDP Growth (All Countries)**

Dependent Variable $g_Y$			
Explanatory Variables	Equation with ODA (net)	Equation with ODA Loan (Net)	Equation with ODA Grants
$g_{Y-1}$	0.302*** (0.064)	0.334*** (0.064)	0.294*** (0.064)
inv	0.355*** (0.052)	0.333*** (0.047)	0.347*** (0.049)
gL	1.238 (0.885)	2.186** (0.940)	1.304 (0.945)
gREM	0.036*** (0.011)	0.040*** (0.011)	0.033*** (0.011)
gODA	0.014** (0.006)		
gOEFODA	0.005*** (0.002)		
gLOAN		0.0003 (0.003)	
gOEFLOAN		0.006* (0.003)	
gGRANTS			0.018** (0.009)
gOEFGRANTS			0.005*** (0.002)
Hansen J-statistics (Over identification Test for all instruments)	4.64 ( <i>P</i> -value: 0.59)	3.60 ( <i>P</i> -value: 0.61)	4.22 ( <i>P</i> -value: 0.52)
Number of Groups	46	46	46
Number of Observations	1033	1080	1077

Notes:

1) *Standard errors* are in parenthesis.

2) \*\*\*, \*\*, and \* represent 1%, 5%, and 10% level of significance, respectively.

3) Lag growth is instrumented by second lag of growth, lag of Food Production Index (FPI), and lag of all financial flows variables.

**Table 3.3B: Effects of Remittance, ODA, ODA loans (net), ODA Grants on GDP Growth (Middle East and Africa)**

Dependent Variable $g_Y$			
Explanatory Variables	Equation with ODA (net)	Equation with ODA Loan (Net)	Equation with ODA Grants
$g_{Y-1}$	0.259*** (0.082)	0.325*** (0.089)	0.252*** (0.089)
Inv	0.284*** (0.059)	0.280*** (0.052)	0.296*** (0.059)
$g_L$	1.301 (1.14)	3.485*** (1.270)	1.879 (1.255)
$g_{REM}$	0.030* (0.016)	0.037** (0.017)	0.027* (0.016)
$g_{ODA}$	0.024* (0.013)		
$g_{OEFODA}$	0.002 (0.003)		
$g_{LOAN}$		-0.002 (0.004)	
$g_{OEFLOAN}$		0.007 (0.005)	
$g_{GRANTS}$			0.024* (0.014)
$g_{OEFGRANTS}$			0.003 (0.003)
Hansen J-statistics (Over identification Test for all instruments)	2.49 ( <i>P</i> -value: 0.78)	6.07 ( <i>P</i> -value: 0.30)	3.46 ( <i>P</i> -value: 0.63)
Number of Groups	26	26	26
Number of Observations	572	597	575

Notes: 1) *Standard errors* are in parenthesis. 2) \*\*\*, \*\*, and \* represent 1%, 5%, and 10% level of significance, respectively. 3) Lag growth is instrumented by second lag of growth, lag of Food Production Index (FPI), and lag of all financial flows variables.

**Table 3.3C: Effects of Remittance, ODA, ODA loans (net), ODA Grants on GDP Growth (Latin America)**

Dependent Variable $g_Y$			
Explanatory Variables	Equation with ODA (net)	Equation with ODA Loan (Net)	Equation with ODA Grants
$g_{Y-1}$	0.251*** (0.059)	0.241*** (0.061)	0.280*** (0.058)
inv	0.541*** (0.040)	0.543*** (0.045)	0.483*** (0.040)
gL	-0.389 (1.94)	-0.110 (2.002)	-0.316 (1.783)
gREM	0.037*** (0.015)	0.037** (0.016)	0.038*** (0.015)
gODA	0.018*** (0.007)		
gOEFODA	0.004 (0.003)		
gLOAN		0.004 (0.003)	
gOEFLOAN		0.004 (0.005)	
gGRANTS			0.025** (0.013)
gOEFGRANTS			0.002 (0.003)
Hansen J-statistics (Over identification Test for all instruments)	6.69 ( <i>P</i> -value: 0.24)	6.63 ( <i>P</i> -value: 0.25)	5.58 ( <i>P</i> -value: 0.34)
Number of Groups	11	11	11
Number of Observations	249	245	270

Notes: 1) *Standard errors* are in parenthesis. 2) \*\*\*, \*\*, and \* represent 1%, 5%, and 10% level of significance, respectively. 3) Lag growth is instrumented by second lag of growth, lag of Food Production Index (FPI), and lag of all financial flows variables.

**Table 3.3D: Effects of Remittance, ODA, ODA loans (net), ODA Grants on GDP Growth (all Asia)**

Dependent Variable $g_Y$			
Explanatory Variables	Equation with ODA (net)	Equation with ODA Loan (Net)	Equation with ODA Grants
$g_{Y-1}$	0.076 (0.067)	0.187** (0.076)	0.087 (0.068)
$inv$	0.392*** (0.048)	0.351*** (0.049)	0.399*** (0.042)
$g_L$	1.895 (1.246)	1.187 (1.228)	0.758 (1.156)
$g_{REM}$	0.046** (0.024)	0.048*** (0.018)	0.057** (0.024)
$g_{ODA}$	0.002 (0.006)		
$g_{OEFODA}$	0.011*** (0.003)		
$g_{LOAN}$		0.004 (0.003)	
$g_{OEFLOAN}$		0.002 (0.004)	
$g_{GRANTS}$			0.014 (0.016)
$g_{OEFGRANTS}$			0.007** (0.003)
Hansen J-statistics (Over identification Test for all instruments)	3.85 ( <i>P</i> -value: 0.57)	5.08 ( <i>P</i> -value: 0.41)	3.03 ( <i>P</i> -value: 0.69)
Number of Groups	8	8	8
Number of Observations	190	217	207

Notes: 1) *Standard errors* are in parenthesis. 2) \*\*\*, \*\*, and \* represent 1%, 5%, and 10% level of significance, respectively. 3) Lag growth is instrumented by second lag of growth, lag of Food Production Index (FPI), and lag of all financial flows variables.

**Table 3.4: Effects of Remittance, ODA, ODA loans (net), ODA Grants on GDP Growth (summary)**

Key Variables	Sign and Level of Significance			
	All Countries	Middle East and all Africa	Latin America	Asia
Remittance	***	+	***	**
ODA net	**	+	***	+ insignificant
Remittance	***	**	**	***
ODA Loans net	+ insignificant	+ insignificant	+ insignificant	+ insignificant
Remittance	***	+	***	**
ODA Grants	**	+	**	+ insignificant
Over-identification test	Pass	Pass	Pass	Pass

## **CHAPTER 4**

# **REMITTANCES AND THE REAL EXCHANGE RATE IN ASIA**

### ***4.1 INTRODUCTION***

The developing world has enjoyed an almost 15-fold increase in remittances from 1980 to 2008, from US\$ 18 billion to US\$ 282 billion respectively. Among all developing regions, Asia has received the largest proportion (see Table 4.1). This rapid increase has led researchers to explore different avenues through which remittances can affect the developing world. There is evidence in the existing literature that remittances contributed positively in recipient countries in the form of consumption smoothing (Lucas & Stark, 1985), enhanced economic growth (Fajnzylber & López, 2008), financial development (Aggarwal, Demirguc-Kunt & Peria, 2006), reduction in absolute poverty and inequality, and improved human capital (Acosta et al., 2008; Adams & Page, 2005). However, a rapid injection of remittances might contribute adversely if it causes the so-called ‘*Dutch Disease*’ effects. According to the ‘*Dutch Disease*’ theoretical framework, a large inflow of capital in the form of remittances might expand aggregate demand through increased household income. The higher demand might then lead to a rise in the relative price of non-tradable goods. This would eventually cause a resource movement from the tradable to the non-tradable sector, leading to real exchange rate appreciation. This

study, following Lartey, Mandelman and Acosta (2008), defines real exchange rate as the local currency equivalent of the US dollar (nominal exchange rate in US\$ per LCU\* $CPI_{LCU}/CPI_{US}$ ). For small open economies, exchange rate appreciation might have severe negative impacts, as it could impair the development of the export sector and hence long-run economic growth (Lartey, Mandelman & Acosta, 2008).

Given a rising share of workers' remittances in the Asian region, this paper focuses on exploring the impact of the inflow of remittances on the exchange rate for some of the Southern Asian (SA) economies where data is available on remittances for a suitable period of time (1978-2011) and the growth of remittances is significantly higher (greater than 4.5%)<sup>16</sup> than other Asian countries. (See Table 4.2 for the list of countries and Table 4.3 for the list of remittance indicators.) This study focuses on examining both long-run and short-run relationships that exist between remittances and the exchange rate using the mean group (MG) and pooled mean group (PMG) estimation technique proposed by Pesaran, Shin and Smith (1999). In addition, the study also attempts to examine the resource movement effect by investigating the impact of remittances on the tradable to non-tradable goods output ratio. Hence this paper contributes to the existing literature by investigating whether remittances cause any appreciation of the real exchange rate both in the long run and short run for a set of SA economies. There is no panel study found in existing literature that focuses on exploring this issue for this specific region, where remittances are becoming a significant source of foreign financial inflow.

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<sup>16</sup> 4.5% is chosen using the rule of 70. It would take 15 years for remittances to be doubled at a 4.5 % rate.



The rest of the paper is structured as follows. Section 4.2 provides a brief discussion on the existing literature. Section 4.3 discusses data and methodological issues of modeling the hypothesis. Section 4.4 analyzes econometric results, followed by concluding remarks in section 4.5.

## **4.2 REVIEW OF LITERATURE**

The theoretical notion of '*Dutch Disease*' is based on the contribution of the Salter–Swan–Corden–Dornbusch model (Corden & Neary, 1982). The model shows the links through which a higher disposable income would possibly lead to an appreciation of the real exchange rate. A rise in disposable income due to a surge of remittances might initiate an expansion in aggregate demand. This higher demand might then cause a rise in the relative prices of non-tradable goods, given that prices of tradable goods are determined exogenously (most commonly referred to as the *spending effect*). If this happens, the non-tradable goods sector might start to expand at the expense of the tradable goods sector due to the higher relative prices of the non-tradable goods. This abrupt expansion of the non-tradable goods sector would require resource reallocation (most commonly referred to as the *resource movement effect*) away from the export-oriented sector of the economy and might eventually lead to currency appreciation. For small open economies, in the absence of effective policy intervention this currency appreciation might hinder the process of economic growth and development<sup>17</sup>.

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<sup>17</sup> It is worth mentioning that an impermanent appreciation of exchange rate might not be detrimental as it might increase the wage (especially in the presence of labor export). A prudent

As the high growth of remittances is a very recent phenomenon, researchers have only begun to explore the impact of remittances on the real exchange rate using the '*Dutch Disease*' framework. Studies examining the relationship include both panel data analyses of multiple countries as well as time series analyses on a specific country. Results were mixed but most of the studies found that remittance flows would cause exchange rate appreciation, supporting the presence of the '*Dutch Disease*' effect.

For the panel data analysis, Amuedo-Dorantes and Pozo's (2004) study is well accepted as the workhorse report on the remittance-real exchange rate relationship. For a set of 13 Latin American and Caribbean countries, they found that a doubling of remittances would cause the real exchange rate to appreciate by 22%. Their findings were arrived at using the instrumental variable regression technique. The study concluded that proper policy intervention would be necessary to endogenize the positive impacts of remittances on the development of small economies.

Lartey, Mandelman and Acosta (2008) conducted a study on a panel of 109 countries using the Generalized Method of Moments (GMM) technique. They used the ratio of tradable-to-non-tradable output as the dependent variable in addition to the real exchange rate in order to capture the *resource movement* effect of remittances. Furthermore, the study provided evidence of differential impacts of remittances for different exchange rate regimes. Lartey, Mandelman and Acosta's research revealed that the share of services in total output rose while the share of manufacturing receded due to rising remittance flow- a result supporting the presence

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management of the exchange rate policy can mitigate the possibility of any detrimental effect of currency appreciation.

of the '*Dutch Disease*' effect. They also found the effect was even stronger under fixed exchange rate regimes. This larger impact under fixed exchange was due to stronger spending effect. An adverse supply shock could lead to a large fall in tradable output under a fixed exchange rate due to sticky price conditions. In that case, appreciation of the domestic currency may sustain if '*Altruistic remittances*' continued to flow towards the country<sup>18</sup>. Therefore, remittance could inflate the price of non-tradable and further deepen currency appreciation due to a stronger *spending effect*. A dummy variable, with positive and significant coefficient, would indicate a stronger *spending effect* for fixed exchange rate regimes (p.10). The most important contribution of this study was that the authors showed a new channel through which the tradable sector could be jeopardized as the growth of remittances could lead to an increase in wealth, thus reducing the labour supply in the economy. This reduction in labour supply could impair the growth of the tradable sector in addition to any '*Dutch Disease*' effect. Winters and Martin (2005) and Lopez, Molina and Bussolo (2007) found evidence in support of the '*Dutch Disease*' phenomenon, while Fajnzylber and Lopez (2008) found evidence in favour of the labour supply reduction effect put forward by Lartey, Mandelman and Acosta (2008).

Using the same set of 109 countries as Lartey, Mandelman and Acosta (2008), Acosta, Baerg and Mandelman (2009) also provided evidence of currency appreciation due to remittance inflows. However, unlike the previous studies, they showed that the pressure on exchange rate appreciation could be managed more efficiently where the financial sector was more developed. A well-developed

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<sup>18</sup> Authors did not provide any evidence to control for such adverse supply shocks in their estimation.

financial system is necessary to maintain a competitive exchange rate regime. Therefore, their study argued that the '*Dutch Disease*' effect would be weaker under a well-managed financial system, as the financial system would be able to channel more remittances towards investment rather than consumption.

Naceur, Bakardzheiva and Kamar (2012) used six different types of financial flows and compared the impact of these flows on real exchange rate appreciation for 57 developing countries from all regions of the world. The study argued that disaggregated foreign flows provided better estimation results by isolating the impact of each flow from others, which is crucial for policy prescription. In general, the results showed that portfolio investments, foreign borrowing and aid led to currency appreciation. Foreign Direct Investment (FDI) would not affect the real exchange rate while remittances revealed 'disparate' results.

Contradictory results were also evident in the panel data studies. Amuedo-Dorantes, Pozo and Vargas-Silva (2010: 125) found contradictions for 27 Small Island Developing States (SIDS). Their paper argued that due to the remoteness of these SIDS and their exposure to natural disasters, remittances affected their exchange rates differently as opposed to other developing countries, with the result actually depreciating the exchange rate. The authors argued that the SIDS, being more import-dependent due to their less diversified domestic production sector, consumed more tradable goods out of remittance income. Therefore, currency depreciated due to the inflow of remittances. In addition, the authors claimed that suppliers could find it difficult to maintain supplies at a constant price due to the remoteness of these countries. Hence, traded goods prices increased in cases of higher demand for these

goods. However, their study found evidence of '*Dutch Disease*' for the full sample of 152 countries<sup>19</sup>. Mongardini and Reyner (2009) also found that remittances were responsible for currency depreciation and therefore not '*Dutch Disease*'. The study investigated a set of Sub-Saharan African (SSA) countries and demonstrated that conflicting results were possibly due to the fact that remittances as well as grants were used to eradicate supply-side bottlenecks, thereby boosting the output of this sector and actually reducing pressure on prices. Hence, where remittances expand capacity and thereby lower prices in the non-traded goods sector, neither the exchange rate nor growth in the export sector would be impaired by the scaling up flows.

Mixed results are evident for country specific time series studies as well. Using remittance data from 1976 to 2005 for Cape Verde, Bourdet and Falck (2006) found evidence of the presence of the '*Dutch Disease*' phenomenon. The study suggested that active involvement of government is warranted to maintain the competitiveness of the export sector. Export processing zones and tax holidays were put forward as suggestions to offset the export sector being jeopardized.

Acosta, Lartey and Mandelman (2009) found similar results for El Salvador. Their study considered three scenarios of remittances: "one where remittances are exogenously determined, another where remittances are counter-cyclical, and, finally, one where remittances act like capital inflows" (2009: 114). In all instances, using

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<sup>19</sup> It was found that the first claim by the authors is inaccurate in the sense that the exchange rate should not be affected if remittances are used in their entirety to pay for imports. The supply of additional foreign exchange through remittances would be exactly offset by an increase in demand for foreign exchange to pay for imported goods. However, the authors correctly identified and accounted for any shocks originated due to natural disasters and any endogeneity bias across dependent and independent variables using variance decomposition, Impulse Response Functions and Vector Autoregressive (VAR) models.

Impulse Response Functions (IRFs), the authors found evidence of exchange rate appreciation due to technological shocks. In addition, the study also found there was *labour supply reduction* due to the wealth effect generated by higher remittances (Lartey, Mandelman & Acosta, 2008). The authors argued that the reduction of labour supply eventually caused an increase in the cost of production of non-tradable goods and consequently raised the prices of non-tradable goods.

Ahmed (2009) found that persistent overvaluation<sup>20</sup> of Pakistan's exchange rate (0.75% in 2001 to 22.9% in 2007) was partially due to an upsurge of remittance flows, with the other contributory factor being Foreign Direct Investment (FDI). In contrast, Bayangos and Jansen (2011) found that remittances created a more far-reaching labour reduction impact than the '*Dutch Disease*' effect in Philippines. Their simulation study demonstrated that unit labour cost increased by 1.4%, although 40% of that increase was due to the *labour supply reduction* effect. Therefore, studies that have focused only on the '*Dutch Disease*' channel missed an important labour cost channel through which export performance of a country can be affected (Bayangos & Jansen, 2011:1844).

Academic studies only recently began to explore the long-run exchange rate relationship between remittance flows and the exchange rate, as longer time series data on variables became available. In the context of '*Dutch Disease*' estimation, Combes, Kinda and Plane (2012) found that for a set of 42 emerging and developing countries, currency appreciated in the long run when taking both private and public transfers into account. However, the study also found that remittances, being a private

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<sup>20</sup> Overvaluation refers to a larger estimated real exchange rate compared to 'ideal' actual exchange rate. This study used Pakistan's currency per US\$ as nominal exchange rate, quite opposite to the one adopted for this present study.

transfer, had a smaller effect on currency appreciation than other types of public transfers. Uneze (2011) found that foreign aid led to exchange rate appreciation for West African Economic and Monetary Union (WAEMU) countries for the period of 1975-2005. Korhonen and Juurikkala (2009) found evidence of currency appreciation due to oil price changes for Organization of Petroleum Exporting Countries (OPEC) countries for the period of 1975-2005.

From the above discussion it is evident that most academic studies support the argument that remittances can cause '*Dutch Disease*'. Currency appreciation due to remittance inflow is supported from both panel and country specific analyses. Another channel through which relative prices of non-tradable goods could rise was found to be labour supply reduction due to an increase in wealth, given the sector is labor-intensive. Analysis within a disaggregated framework was necessary to isolate this labour reduction effect from the '*Dutch Disease*' effect. Only a few studies found that remittances could cause depreciation of the exchange rate (Mongardini and Reyner, 2009; Dorantes, Pozo and Vargas-Silva, 2010).

This present study focuses on exploring the idea of currency appreciation due to increased remittance flow to a set of Southern Asian countries, both in long run and short run. The study did not attempt to investigate the *labour supply reduction* channel due to data unavailability.

### **4.3 METHODOLOGY**

#### **4.3.1 Selection of Countries**

The key variables for this study are receipt of worker's remittances and the real exchange rate. Six countries from the Southern Asian (SA) region have been

selected based on the availability of data for these two variables and where the growth rate of remittances and other remittance-related indicators are significantly higher compared to the other Asian countries (see Table 4.2 for the list of countries). The time period of 1978-2011 has also been selected on the basis of data availability. As higher growth of remittances would generate higher household income, it is expected the '*Dutch Disease*' effect would be stronger for remittance growth countries. Table 4.3 portrays three indicators of remittances (remittance per capita, remittance to GDP ratio, and average growth rate of remittance) for the six SA countries. For these countries, remittances per capita varied from US\$ 13.55 to US\$ 104.53, and the remittance to GDP ratio varied from 1.18% to 6.69%.

#### **4.3.2 Data and Specification of the Model**

The study explores the avenue through which countries receiving increased remittances would likely experience currency appreciation. Additional income generated from remittances might put upward pressure on the relative price of non-tradable goods. This could occur in two steps. First, remittance receivers could demand more goods from this market and the increased relative price could cause exchange rate appreciation (the *spending* effect). Therefore, a rise in the average  $CPI_{LCU}$  is expected due to the *spending* effect of remittance flow<sup>21</sup>. Second, resources might start to move towards non-tradable sector due to higher prices. Therefore, the tradable sector could contract in favour of the non-tradable sector (the *resource movement* effect).

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<sup>21</sup>  $CPI_{LCU}$  is adopted as a proxy for relative prices of tradable to non-tradable, which is the closest available open source data.



This study attempts to examine both of these effects. The *spending* effect is examined using the real exchange rate as the dependent variable. To investigate the *resource movement* effect, the ratio of the tradable to the non-tradable sector is used as a regressand in lieu of the real exchange rate following Lartey, Mandelman and Acosta (2008).

The study uses both the MG and PMG estimation procedures, proposed by Pesaran and Smith (1995) and Pesaran, Shin and Smith (1999) respectively, to examine the long-run as well as the short-run relationships. MG and PMG estimates provide efficient estimators in the presence of a panel with large time series (T=34years in this study) and if non-stationarity exists within variables. The MG approach estimates a single time series equation for each panel (in this case, six different regressions for six countries) and averages all coefficients to acquire a single coefficient for each variable across panel. In contrast, the PMG approach, a combination of pooling and averaging, pools the entire panel to estimate long-run coefficients while averaging short-run coefficients, allowing for variation across panel. Hence the PMG estimator restricts the long-run coefficients to be equal across panel while allowing the intercept, short-run coefficients and error correction variance to vary across panel. The pooling coefficients are estimated applying a Maximum Likelihood Estimation (MLE) procedure. Pesaran, Shin and Smith (1999) argued the PMG approach provides better results compared to the MG approach when estimates suffer from measurement errors, outliers and omitted variables. Uneze (2011) and Korhonen and Juurikkala (2009) used the mean group (MG) and the

pooled PMG approach to examine exchange rate appreciation for a set of West African countries and OPEC countries respectively.

On the basis of the '*Dutch-Disease*' framework, the basic model this paper estimates is as follows:

$$rer_{i,t} = \Pi(\text{remgdp}_{i,t}, Z_{i,t}) \dots \dots \dots (1)$$
 [i and t represents country and time series indicators respectively]

Equation (1) portrays that the real exchange rate (rer) will be determined by receipt of workers' remittances as a percentage of GDP (remgdp) and a vector of other determinants (Z), both in the long-run and short-run. The real exchange rate shows the local currency equivalent of the US dollar (nominal exchange rate in US\$ per LCU \*  $CPI_{LCU}/CPI_{US}$ ). The study employs the remittances to GDP ratio instead of the level of remittances to partially offset the impact of varied sizes of countries in the data set. It is expected that the coefficient for  $\text{Remgdp}_{i,t}$  will be positive in the presence of '*Dutch Disease*' effect.

Among other determinants of exchange rates that are selected, following Amuedo-Dorantes and Pozo (2004) and Lartey, Mandelman and Acosta (2008), the most important one is the difference in technological progress across countries. According to Amuedo-Dorantes and Pozo, richer countries are expected to experience greater real exchange appreciation. This is due to higher relative prices in the tradable goods sector than those in the non-tradable goods sector, as productivity growth affects the export sector first. Due to productivity growth, wages increase in the tradable sector and put upward pressure on the prices of non-tradable goods. Therefore, richer countries with higher productivity growth would typically anticipate

a greater degree of currency appreciation than others. Following Amuedo-Dorantes and Pozo (2004), this study uses the GDP per capita (gdppc) of countries as a proxy for the technological differences across countries because of data unavailability to directly measure productivity growth. It is expected that higher per capita income countries would experience currency appreciation.

In addition to the supply side dynamics, the demand side of an economy might affect the exchange rate as well. If government expenditure (gc) favours the non-traded goods sector, the relative price of non-traded goods might increase and create upward pressure on the real exchange rate (Froot & Rogoff, 1995). This study uses the ratio of government consumption to GDP as an explanatory variable.

External terms of trade fluctuations could lead to currency movements also. Resources could move towards export sectors if prices of exports rise relative to prices of imports. Thus the non-tradable goods sector would experience a contraction. Following Amuedo-Dorantes and Pozo (2004) therefore, the study employs a gross barter terms of trade variable (tot) represented by the ratio of the price of exports to the price of imports.

Other control variables are money and quasi-money supply (M2) as a percentage of GDP (m2), a measure of trade openness (open), and foreign aid as a percentage of GDP (aidgdp). In general, excess money growth is associated with currency appreciation as it creates pressure on prices of non-tradable goods. However, if domestic interest rates decline due to money growth, a real depreciation can occur as a result of low return on financial investments (Lartey, Mandelman & Acosta, 2008: 8). Hence, the sign of this coefficient is not very straightforward from a

theoretical perspective. Trade openness is measured by taking the ratio of the sum of exports and imports value to GDP. Openness is taken as a proxy to apprehend the impact of any trade restrictions, following Lartey, Mandelman and Acosta (2008). The sign of the variable depends on the comparative strength of income and substitution effects caused by higher import prices due to any government policies; for instance, an increase in import tariffs. The negative income effect due to higher import prices can cause a decline of non-tradable prices (lower overall demand) and hence currency may depreciate. In contrast, due to a substitution effect, the demand for non-tradable goods may increase as a result of the higher price of imported traded goods. A positive coefficient is expected if the substitution effect is larger than the income effect, showing currency appreciation (Lartey, Mandelman & Acosta, 2008: 7). The study includes foreign aid to capture the overall impact of other non-market financial flows on the exchange rate movement. Total Official Development Assistance (ODA) as a percentage of GDP is used to capture this effect. Variables are adjusted for inflation by using the Consumer Price Index (CPI) where necessary.

For the long-run, the elaborated PMG equation, considered for estimation in this study, is as follows:

$$rer_{i,t} = (remgdp_{i,t}, gdppc_{i,t}, aidgdp_{i,t}, gc_{i,t}, tot_{i,t}, open_t, m2_{i,t}) \dots \dots \dots (2)$$

Where, recall, the exchange rate is determined by the remittance to GDP ratio, GDP per capita, aid to GDP ratio, government consumption to GDP ratio, terms of trade, openness, and money supply to GDP ratio. PMG follows an autoregressive distributed lag process (ARDL) of order (p, q). The short-run error correction equation is as follows:

$$\Delta rer_{it} = \theta_i rer_{it-1} + \beta_i Z_{it} + \sum_{j=1}^{p-1} \lambda_{ij} \Delta rer_{it-j} + \sum_{j=0}^{q-1} \phi_{ij} \Delta Z_{it-j} + \alpha_i + \epsilon_{it} \quad \dots \dots (3)$$

In equation (3),  $\theta$  represents the error correction coefficient. This coefficient is important for two reasons. First, it is expected that  $\theta < 0$  in order to ensure model stability. Second, a negative and significant  $\theta$  portrays the existence of a long-run cointegrated relationship between the dependent variable and control variables. It also shows the speed of adjustment from short-run towards long-run.  $Z$  represents all control variables including the remittance to GDP ratio.  $\beta$  represents all long-run coefficients.  $\beta$  is common across panel in the PMG approach and varies across panel in the MG approach. Short-run coefficients are represented by  $\phi$  and  $\lambda$ .  $\alpha$  and  $\epsilon$  represent the constant and error coefficients of the model respectively. To investigate whether the panel consists of a homogeneous (PMG) or heterogeneous (MG) long-run relationship, a Hausman test is applied following Pesaran, Shin & Smith (1999).

A positive coefficient ( $\beta$ ) will then represent exchange rate appreciation and vice-versa. However, a positive coefficient of remittance investigates only the *spending effect*. In order to understand the resource reallocation dynamics, another set of regressions has been devised. The *resource movement* effect will take place only when the tradable sector contracts and/or non-tradable sector expands. Therefore, the study computes the tradable to non-tradable output ratio as a dependent variable to capture the impact of remittances on the variable. As data is not readily available on tradable goods, following Lartey, Mandelman and Acosta (2008), the study uses as a proxy the ratio of the sum of agriculture and manufacturing value added as a percentage of GDP to service sector value added as a percentage of GDP. The

assumption is the service sector represents the non-tradable sector and agriculture and manufacturing together represent the tradable sector. The PMG equation is as follows:

$$\Delta tnt_{it} = \theta_i tnt_{it-1} + \beta_i Z_{it} + \sum_{j=1}^{p-1} \lambda_{ij} \Delta tnt_{it-j} + \sum_{j=0}^{q-1} \phi_{ij} \Delta Z_{it-j} + \alpha_i + \epsilon_{it}$$

... (4)

In equation (4) the same set of baseline control variables is used, except for GDP per capita which, following Larrey, Mandelman and Acosta, is replaced by fixed capital formation as a percentage of GDP, as this is considered to be a better measure to capture resource allocation dynamics. Resource movement is expected to be more associated with the size of investment compared to GDP than overall level of technological progress as measured by GDP per capita. A negative sign of any coefficient of the control variables will then reveal a contraction of the tradable sector and/or expansion of the non-tradable sector.

Prior to estimating equation (3) or (4), it is warranted to check whether variables are cointegrated in the long-run. The study conducts a unit root test on each variable to check the unit root process. In addition, it also investigates the unit root process for each country separately to further ensure that cointegration is present, not only for the overall panel but also for individual countries. STATA software has a number of procedures to test for unit roots. This study uses Im, Pesaran and Shin's (2003) test to examine the presence of unit root in variables. A major improvement of this test is that it allows each country in the panel to have its own test value and thus acknowledges country heterogeneity within the panel. The null hypothesis is that all panels have a unit root, with the alternative hypothesis being that a fraction of the

panels that are stationary is non-zero. Akaike's information criterion (AIC) is used to select an appropriate lag length for the estimation procedure.

#### **4.4 RESULTS**

Table 4.4 provides a summary (mean) of all variables. According to Table 4.4, the average real exchange rate is around 2.6 US cents in exchange for one unit of local currency. Average remittances to GDP ratio is 4.26% with a maximum of 13.16%. Average aid to GDP ratio is 2.50%, which is lower than the average remittance to GDP ratio for these countries. GDP per capita is \$1,306 with a low of \$331 (Bangladesh) and a high of \$6,416 (Thailand) in real terms. Money supply as a percentage of GDP is around 48%, with a high of 128% for Thailand. The trade openness ratio is 0.54 with a high of 1.5 for Thailand.

Table 4.5 and 4.6 provide estimates related to the unit root test. Table 4.5 shows results for individual countries. All variables are estimated at their levels and first difference (denoted by  $\Delta$ ). It is expected the null will not be rejected at levels and will be rejected at first difference for a variable to reveal a unit root process. The last column in Table 4.5 shows a temporary prediction about the unit root process of the overall panel. For all variables, the expected results are evident. Except for GDP per capita, all other variables reveal a unit root process, and hence are assumed to be cointegrated in the long-run. As for GDP per capita, the null is rejected at 1% for Bangladesh, Philippines and Sri Lanka at levels. However, the null for India, Pakistan, and Thailand cannot be rejected. Therefore, it is concluded the GDP per capita is mostly stationary. Table 4.6 provides result for the overall panel. The null

that variables are cointegrated at levels for all variables except for GDP per capita cannot be rejected. For first difference, the null (at 1% level) that variables are cointegrated is rejected. Therefore, it is concluded that all variables are cointegrated and possess a  $I(1)$  process, except for GDP per capita. Therefore GDP per capita is computed only for the short-run equation as the long-run requires variables to be cointegrated<sup>22</sup>.

The estimation of equation (3) is presented in Table 4.7. Both MG and PMG results are presented in the table for long-run and short-run equations. The consistency of PMG estimates against MG estimates was tested by computing the Hausman test as proposed by Pesaran, Shin and Smith (1999). According to these authors, MG coefficients are often found to be large and insignificant, as they are sensitive to outliers and errors in estimation. The null hypothesis of the Hausman test is that MG and PMG coefficients are not systematically different. Hence, the null is not rejected, PMG coefficients will reveal consistent estimators and the panel will be assumed to have a homogeneous long-run relationship. For equation (3), the null for the Hausman test ( $\chi^2 = 6.87$ ) was not rejected. Therefore, the study concludes that a systematic pooled homogeneous (PMG) long-run relationship exists between the exchange rate and remittance flows for this set of SA countries. Therefore, for equation (3), the main objective is analyzing the PMG coefficients.

PMG estimates reveal the expected long-run relationship for most variables. For remittances, the key interest variable, the PMG estimate shows that a 1 percentage point increase in the remittances to GDP ratio causes about a 0.13

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<sup>22</sup> Exclusion of GDP per capita would make the error larger. However, it can also be argued that for developing countries it may not cause a huge impact, as most of technology is imported from the outside.



percentage point appreciation of the real exchange rate, providing evidence of the ‘*Dutch Disease*’ effect for this set of countries. The aid to GDP ratio is significantly positive for both MG and PMG estimates. However, the aid to GDP coefficient (0.122) is smaller than that of the remittances to GDP coefficient (0.126), indicating stronger private transfer *spending* effects than public transfer effects. The impact of aid significantly depends on the utilization, composition and distribution aspect of the flow. For instance, if aid is used to finance imports, the impact on the exchange rate will be mitigated (Gupta, Powell & Yang, 2005). However, in this study, a positive aid to GDP coefficient indicates utilization of aid is favouring the non-tradable sector in terms of spending. Government consumption expenditure also reveals a strong positive currency appreciation effect. A 1 percentage point increase in the government expenditure to GDP ratio produces a 0.051 percentage point appreciation of the real exchange rate. The appreciation is possibly due to the fact that fiscal expansion is disproportionately allocated towards the non-traded sector. Amuedo-Dorantes and Pozo (2004) and Kim and Roubini (2008) also found that government consumption tends to favour expenditure in the non-tradable goods sector. Money supply (M2) as a percentage of GDP reveals depreciation of the exchange rate. A 1 percentage point increase in money supply as a percentage of GDP reduces the real exchange rate by 0.111 percentage points. An increase in money supply can lower the interest rate if money demand remains stable, which can reduce the rate of return on investments in local currency. A lower rate of return could release some of the pressures on the exchange rate by lowering interest-sensitive investments in the economy (Lartey, Mandelman & Acosta, 2008: 8). Lartey, Mandelman and Acosta

also found evidence of currency depreciation for this specific variable. Trade openness is also found to be significant and negative showing evidence of currency depreciation. If the negative income effect is stronger than the substitution effect in the event of a government-initiated policy change (for example, an increase in tariffs), currency depreciation is expected. The study concludes that a homogeneous much stronger income effect takes place as opposed to substitution effect for this set of countries. Hence, price increases due to any trade-related restrictions reduce spending more in the tradable sector than in the non-tradable sector. The effect of terms of trade changes is significant but very small, with income and substitution effect cancelling each other out. Change in the remittances to GDP ratio is the only variable that shows a significant result in the short-run for the PMG estimate.

The error correction coefficient ( $\theta$ ) is found to be significantly negative for both MG and PMG estimation. First, this indicates the model is stable. Second, this reveals that a long-run cointegrated relationship exists between the real exchange rate and other control variables. The PMG error correction coefficient is -0.355. In terms of speed of adjustment, it is evident that about one-third ( $1/0.355$ ) of the gap between the short-run and long-run equilibrium real exchange rate is corrected within a year, and approximately three years is required for the exchange rate to adjust any short-run changes.

In general, PMG estimation results reveal that a large foreign financial inflow can cause the '*Dutch Disease*' spending effect for SA countries in the long-run. The model is stable and the Hausman test provides evidence of consistent PMG estimators over MG estimators. Therefore, the study concludes that a homogeneous long-run

real exchange rate appreciation is expected due to a surge in non-market financial inflows towards SA countries.

However, equation (3) is not sufficient to investigate the *resource movement* effect that is caused by '*Dutch Disease*'. Thus the study devises another set of regressions (equation 4) to investigate whether long-term resource reallocation actually takes place in favour of the non-tradable sector. The tradable to non-tradable output ratio (tnt) is used as the dependent variable in this model. A cursory investigation of the tnt variable reveals that over the period of 1978 to 2011 the ratio declines for all countries except Thailand<sup>23</sup>. Figure 4.1 depicts the scatter plot of the variable for all SA countries along with the trend. The next step is to investigate whether the inflow of remittances is significantly affecting the process of expansion of the tradable sector. A negative remittance to GDP coefficient is therefore necessary to show that the '*resource movement*' effect is triggering '*Dutch Disease*' in this region.

Table 4.8 shows results for both the MG and PMG estimation of equation (4). The study rejects the null of a homogeneous relationship (Hausman test:  $\chi^2 = 144.99$ ) and concludes that MG estimators are consistent. Hence the '*resource movement*' effect is found to be heterogeneous across countries. This is not surprising in the sense that non-tradable sectors are different across countries and different processes of expansion are expected. MG estimation results reveal that the coefficient of remittances to GDP ratio is negative and significant at the 1% level, suggesting that

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<sup>23</sup> Using agriculture, manufacturing and service sectors as proxies for tradable to non-tradable sector might not fully capture the dynamics of tradable to non-tradable sector resource movements. A large portion of agricultural output might be non-tradable in nature. Therefore, it might create a downward bias in estimations.

an increase in the remittances to GDP ratio leads to the expansion of the non-tradable sector. A 1 percentage point increase in the remittances to GDP ratio reduces the tradable to non-tradable output ratio by 0.036 percentage points. PMG coefficients reveal statistically significant results for all other variables, unlike the MG coefficients. Trade openness is also found to be significant in the MG Approach. A 1percentage point increase in openness would cause a 0.61 percentage point increase in the tradable to non-tradable ratio. This is to be expected, as an increase in trade activities is necessary to ensure expansion of the agriculture and manufacturing sectors over time. The terms of trade variable is found to be insignificant in the MG estimation. However, the variable is significant in the PMG estimation which reveals that improvements in terms of trade would lead to better performance of the tradable sector for these countries.

The error correction coefficient ( $\theta$ ) is negative and significant, portraying a stable long-run relationship between dependent and explanatory variables. In general, Table 4.8 demonstrates that a persistent *resource movement* away from the tradable towards the non-tradable sector caused by inflows of remittances is evident for this set of SA countries. However, the reallocation process varies across countries.

## ***4.5 CONCLUSION***

This study investigated whether the high flow of remittances in the Southern Asian region would cause long-run currency appreciation due to '*Dutch Disease*' effects. *Spending* effect and *resource movement* effect are two channels through which a surge of remittances could cause '*Dutch Disease*'. The study attempted to investigate both channels using mean group (MG) and pooled mean group (PMG)

estimation techniques. A strong homogeneous *spending* effect is observed for this set of countries. A 1% point increase in the remittances to GDP ratio could cause about a 0.13 percentage point appreciation of the real exchange rate. Furthermore, a negative and significant error correction coefficient confirmed the stability of the model and the existence of a homogeneous long-run relationship. In terms of the *resource movement effect*, the study found that remittances significantly impacted expansion of the non-tradable sector at the expense of the tradable sector. However, the process is heterogeneous across the panel. Estimation results also confirmed that a stable long-run relationship exists for this model as well. Therefore, the study concluded that remittances caused '*Dutch Disease*' for this set of Southern Asian countries. One of the caveats of the study is the failure to capture the long-run impact of technological growth on exchange rate appreciation. GDP per capita, used as a proxy for differences in productivity growth, is used only in the short-run equation. However, the impact of technological change is more of a long-run phenomenon than a short-run phenomenon.

The presence of '*Dutch Disease*' calls for active policy intervention in the face of large increases in remittance receipts. Otherwise, the export sector would eventually be affected by an appreciating exchange rate. Governments could implement policies in favour of export sector expansion. For instance, they could devise mechanisms so a higher proportion of remittances are channeled towards investment as opposed to consumption. Governments could also directly intervene in the export sector through the establishment of export processing zones (EPZ). However, concrete proposals for appropriate and workable policy interventions would

require extensive country specific investigations to ascertain the channels through which remittances or other external non-market financial flows affect exchange rates.

## **REFERENCES**

- Acosta, P.A., Calderòn, C., Fajnzylber, P. & Lòpez, H. (2008). What is the Impact of International Migrant Remittances on Poverty and Inequality in Latin America? *World Development*, 36(1), 89-114.
- Acosta, P.A., Baerg, N.R. & Mandelman, F.S. (2009). Financial Development, Remittances and Real Exchange Rate Appreciation. *Economic Review*, 94(1), 1-12, Federal Reserve Bank of Atlanta.
- Acosta, P.A., Lartey, E.K.K. & Mandelman, F.S. (2009). Remittances and the Dutch Disease. *Journal of International Economics*, 79.
- Adams, R. & Page, J. (2005). Do International Migration and Remittances Reduce Poverty in Developing Countries? *World Development*, 33 (10), 1645-1669.
- Aggarwal, R., Demirguc-Kunt, A. & Peria, M. (2006). Do workers' remittances promote financial development? *World Bank Policy Research Working Paper*, 3957. World Bank, Washington, DC.
- Ahmed, H. (2009). Capital Flows and Real Exchange Rate Overvaluation - A Chronic Ailment: Evidence from Pakistan. *Lahore Journal of Economics*, 14, 51-86.
- Ahortor, C.R.K. & Adenutsi, D. E. (2009). The Impact of Remittances on Economic Growth in Small-Open Developing Economies. *Journal of Applied Sciences*, 9(18), 3275-3286.
- Amuedo-Dorantes, C. & Pozo, S. (2004). Workers' Remittances and the Real Exchange Rate: A Paradox of Gifts. *World Development*, 32 (8), 1407-1417.

- Amuedo-Dorantes, C., Pozo, S. & Vargas-Silva, C. (2010). Remittances in Small Island Developing States. *Journal of Development Studies*, 46(5), 941-960.
- Bayangos, V. & Jansen, K. (2011). Remittances and Competitiveness: The Case of the Philippines. *World Development*, 39(10), 1834-1846.
- Bourdet, Y. & Falck, H. (2006). Emigrants' remittances and Dutch Disease in Cape Verde. *International Economic Journal*, 20(3), 267-284.
- Corden, W.M. & Neary, J.P. (1982). Booming sector and de-industrialization in a small open economy. *Economic Journal*, 92, 825–848.
- Combes, J., Kinda, T. & Plane, P. (2012). Capital flows, exchange rate flexibility, and real exchange rate. *Journal of Macroeconomics*, 34, 2012.
- Cox Edwards, A. & Ureta, M. (2001). *Income Transfers and Children's Schooling: Evidence from El Salvador*, Mimeo.
- Fajnzylber, P. & López, H. (eds.). (2008). *Remittances and Development: Lessons from Latin America*. World Bank, Washington, DC.
- Froot, K. A. & Rogoff, K. (1995). Perspectives on PPP and long-run real exchange rates. In G. Grossman & K. Rogoff (eds.), *Handbook of International Economics* (Vol. III). Amsterdam: Elsevier Science B. V.
- Gupta, S., Powell, R. & Yang, Y. (2005). The macroeconomic challenges of scaling up aid to Africa. *IMF working paper 05/79*, Washington, DC: International Monetary Fund.
- Im, K.S., Pesaran, M.H. & Shin, Y. (2003). Testing for Unit Roots in Heterogeneous panels. *Journal of Econometrics*, 115, 53-74.



- Kim, S. & Roubini, N. (2008). Twin deficit or twin divergence? Fiscal policy, current account, and the real exchange rate in the US. *Journal of International Economics*, 74, 362–384.
- Korhonen, I. & Juurikkala, T. (2009). Equilibrium Exchange Rates in Oil-exporting Countries. *Journal of Economics and Finance*. 33, 71-9.
- Lartey, E.K.K., Mandelman, F.S. & Acosta, P.A. (2008). Remittances, Exchange Rate Regimes, and the Dutch Disease: A Panel Data Analysis. *Federal Reserve Bank of Atlanta Working Paper Series*.
- Lopez, H., Molina, L. & Bussolo, M. (2007). Remittances and the real exchange rate. *World Bank Policy Research Working Paper 4213*, April 1.
- Lucas, R. & Stark, O. (1985). Motivations to remit: Evidence from Botswana. *Journal of Political Economy*, 93, 901–918.
- Naceur, S.B., Bakardzheiva, D. & Kamar, B. (2012). Disaggregated Capital Flows and Developing Countries' Competitiveness. *World Development*, 40(2), 223-237.
- Mongardini, J. & Reyner, B. (2009). Grants, Remittances, and the Equilibrium Real Exchange Rate in Sub-Saharan African Countries. *IMF Working Paper*. International Monetary Fund.
- Pesaran, M.H., Shin, Y. & Smith, R.P. (1999). Pooled mean group estimation of dynamic heterogeneous panels. *Journal of the American Statistical Association*. 94, 621–34.
- Pesaran, M.H. & Smith, R.P. (1995). Estimating long-run relationships from dynamic heterogeneous panels. *Journal of Econometrics*. 68, 79–113.

- Uneze, E. (2011). Foreign Aid and the Real Exchange rate in the West African Economic and Monetary Union (WAEMU). *Applied Econometrics and International Development*. 11(1), 147-69.
- Winters, L.A. & Martins, P.M.G. (2005). When comparative advantage is not enough: Business costs in small remote economies. *World Trade Review*, 3(3), 347–83.

## APPENDIX

**Table 4.1: Migrant Remittance Flows (in US\$ millions)**

	Year								
	1980	1985	1990	1995	2000	2005	2006	2007	2008
All developing countries	18,384	19,565	31,058	57,302	84,186	94,174	228,801	264,896	282,793
East Asia and pacific	1,663	2,133	3,263	9,700	16,682	46,586	52,841	57,988	62,307
South Asia	5,296	5,801	5,572	10,005	17,212	33,092	39,615	43,824	50,942

Source: Ahortor & Adenutsi (2009)

**Table 4.2: Complete list of countries (Southern Asian Region)**

Bangladesh	Pakistan	Sri Lanka
India	Philippines	Thailand

**Table 4.3: Remittance indicators for a selected set of countries (1978-2011)**

Countries	Remittance per capita (US\$)	Remittance-GDP ratio	Average growth of Remittance
Bangladesh	\$18.72	4.66%	12.17%
India	\$13.55	1.96%	6.61%
Pakistan	\$55.55	4.98%	4.51%
Philippines	\$104.53	6.69%	9.95%
Sri Lanka	\$65.44	6.10%	12.68%
Thailand	\$25.01	1.18%	6.62%

Source: Author's own calculation, using data from World Development Indicators (WDI) online

**Table 4.4: Summary statistics (mean of variables)**

Variables ( <i>codes</i> )	High remittance growth countries (Southern Asian Region)
Real exchange rate ( <i>rer</i> )	0.026 (0.012-0.050)
Remittance to GDP ratio (%) ( <i>remgdp</i> )	4.26 (0.40-13.16)
Aid to GDP ratio (%) ( <i>aidgdp</i> )	2.50 (\$0.00-11.78)
Government Expenditure to GDP ( <i>gc</i> )	0.099 (0.041-0.176)
GDP per capita ( <i>gdppc</i> )	\$1306 (\$331-\$6416)
Terms of trade ( <i>tot</i> )	99.60 (50.39-162.26)
M2 (% GDP) ( <i>m2</i> )	48.84 (13.39-128.21)
Trade openness (X+M/GDP) ( <i>open</i> )	0.542 (0.120-1.503)
Tradable/Non-tradable ratio ( <i>tnt</i> )	0.80 (0.50-1.42)
Capital formation to GDP ratio (%) ( <i>invest</i> )	23.66 (11.20-42.84)
Number of observations	204

Notes:

- 1) Minimum and maximum in parenthesis.
- 2) All data is collected from the World Bank's World Development Indicators (WDI) database.

**Table 4.5: Unit root test (by country)**

<b>Variables</b>	<b>Countries</b>						<b>Decision</b>
	<i>Banglad</i> <i>esh</i>	<i>India</i>	<i>Pakistan</i>	<i>Philippin</i> <i>es</i>	<i>Sri</i> <i>Lanka</i>	<i>Thailand</i>	
<i>rer</i>	-0.924	-1.02	-2.02**	-0.81	2.58	-0.39	Mostly I (1)
$\Delta rer$	-3.11***	-3.21***	-3.03***	-3.53***	-0.96	-3.04***	Mostly I (0)
<i>remgdp</i>	2.36	0.81	0.15	0.69	-1.47*	-0.60	Mostly I (1)
$\Delta remgdp$	-3.13***	-6.28***	-4.59***	-5.99***	-2.20**	-1.45*	I (0)
<i>aidgdp</i>	0.75	0.40	-1.49*	0.09	0.73	1.05	Mostly I (1)
$\Delta aidgdp$	-8.11***	-6.97***	-5.74***	-5.97***	-7.82***	-3.77***	I (0)
<i>gc</i>	-1.46*	-1.06	0.08	-0.31	0.84	-0.04	Mostly I (1)
$\Delta gc$	-4.90***	-2.93***	-6.41***	-2.57**	-5.45***	-2.58***	I (0)
<i>gdppc</i>	-3.25***	-0.82	0.30	-2.10***	-2.94***	0.46	Mostly I(0)
<i>tot</i>	2.18	0.28	1.21	-0.56	-0.23	-1.15	I (1)
$\Delta tot$	-4.63***	-5.00***	-4.89***	-5.68***	-3.77***	-6.22***	I (0)
<i>m2</i>	3.49	2.61	-1.53*	0.76	-0.34	0.90	Mostly I (1)
$\Delta m2$	-2.95***	-2.73***	-3.28***	-5.39***	-5.93***	-2.89**	I (0)
<i>open</i>	2.82	3.92	-2.44***	0.24	0.09	1.35	Mostly I (1)
$\Delta open$	-4.20***	-5.37***	-6.00***	-3.57***	-3.88***	-5.48***	I (0)
<i>tnt</i>	-1.50*	1.77	-0.42	0.37	0.28	0.59	Mostly I (1)
$\Delta tnt$	-4.41***	-9.56***	-5.59***	-4.29***	-3.94***	-5.63***	I (0)
<i>Invest</i>	-0.626	1.562	-1.643**	-1.913**	-1.438	-0.640	Mostly I (1)
$\Delta invest$	-6.12***	-7.26***	-2.01***	-3.79***	-4.93***	-3.56***	I (0)

Note: Unit root test following Im, Pesaran & Shin (2003)

**Table 4.6: Panel unit root test**

Variables	level	First difference	Decision I (1) vs. I (0)
Real exchange rate	-1.07	-6.88***	Unit root
Remittance to GDP ratio (%)	0.78	-9.63***	Unit root
Aid to GDP ratio (%)	0.65	-15.61***	Unit root
GDP per capita	-3.41***	-	No unit root
Government Expenditure to GDP	-0.82	-10.15***	Unit root
Terms of trade	0.73	-12.32***	Unit root
M2 (% GDP)	2.40	-9.45	Unit root
Trade openness (X+M/GDP)	2.46	-11.64***	Unit root
Tradable/Non-tradable ratio	0.47	-13.64***	Unit root
Capital formation to GDP ratio (%)	-1.24	-11.30***	Unit root

Notes:

- 1) Unit root test following Im, Pesaran & Shin, (2003)
- 2) Lag length is determined following Akaike Information Criterion (AIC).

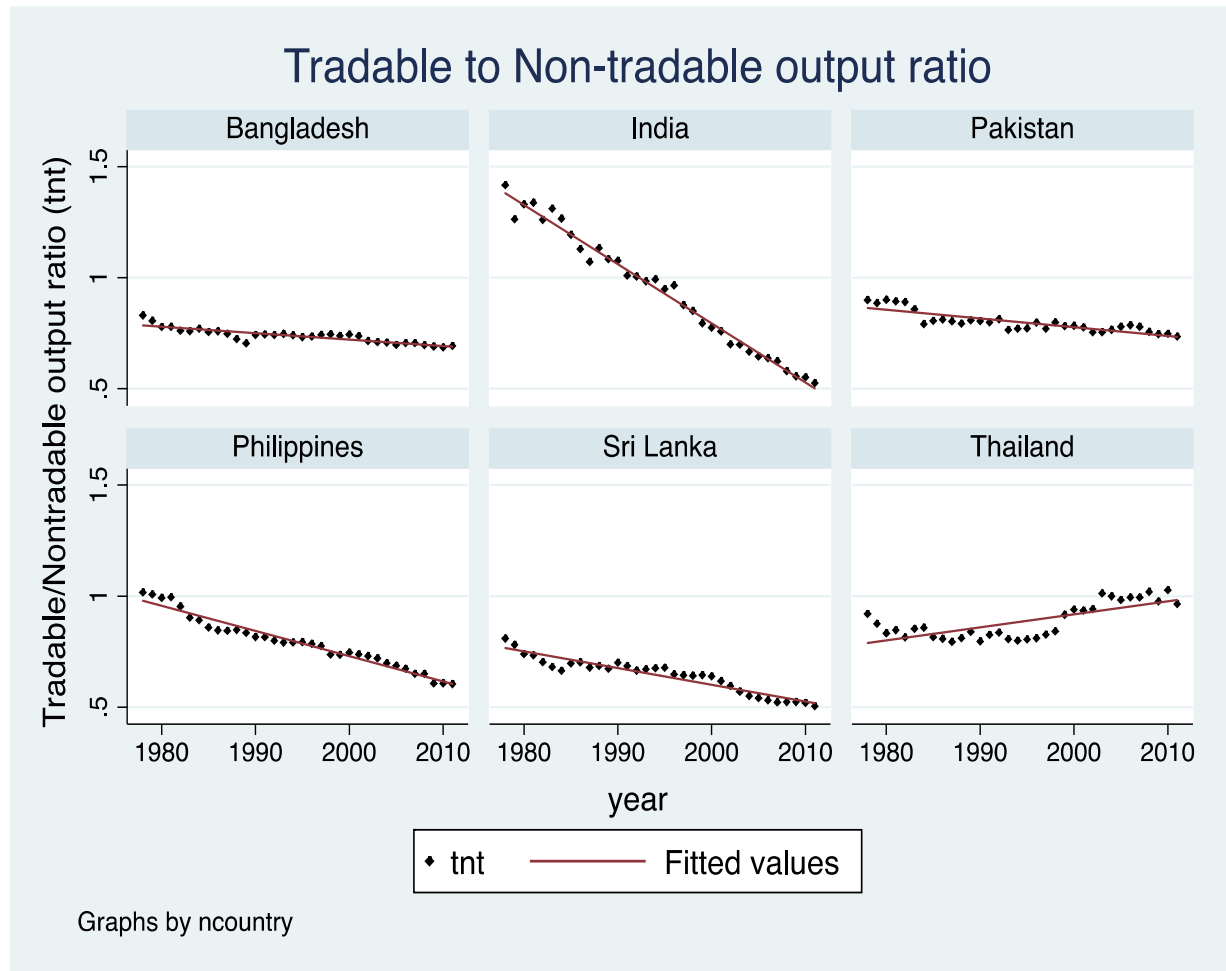
**Table 4.7: Mean Group (MG) and Pooled Mean Group (PMG) estimation results**

<b>Dependent variable: Real exchange rate</b>		
<b>Explanatory variables</b>	<b>Mean Group</b>	<b>Pooled mean group</b>
	<b>Long-run coefficients</b>	
Remittance to GDP ratio	0.036 (0.64)	0.126 (5.87)***
Aid to GDP ratio	0.214 (1.74)*	0.122 (4.21)***
Government Expenditure to GDP	0.018 (0.25)	0.051 (2.08)**
Terms of trade	0.0004 (0.93)	0.0005 (4.97)***
M2 to GDP ratio	-0.019 (-1.15)	-0.111 (-2.46)**
Trade openness (X+M/GDP)	0.027 (1.07)	-0.009 (-1.82)*
<b>Short-run coefficients</b>		
<i>Error Correction Coefficient</i>	-0.720 (-4.17)***	-0.355 (-2.39)**
$\Delta$ Remittance to GDP ratio	0.010 (0.18)	0.058 (2.65)***
$\Delta$ Aid to GDP ratio	-0.27 (-0.83)	-0.017 (-0.54)
GDP per Capita (‘000s US\$)	0.007 (1.27)	0.004 (0.77)
$\Delta$ Government Expenditure to GDP	-0.001 (-0.03)	-0.007 (-0.29)
$\Delta$ Terms of trade	0.00003 (1.29)	-0.00005 (0.77)
$\Delta$ M2 to GDP ratio	-0.009 (-2.45)**	-0.005 (-0.82)
$\Delta$ Trade openness	0.002 (0.31)	0.005 (1.16)
Constant	0.002 (0.36)	0.004 (2.55)**
Number of Observations ( $N \times T$ )	173	173
<b>Hausman test:</b>	$\chi^2$ Coefficient	6.87
Ho: Common Coefficients (MG and PMG)	Tail Probability	0.3334

Notes: 1) \*, \*\*, \*\*\* Indicates significance at 10%, 5%, and 1% respectively. 2) Z-statistics in parenthesis.



**Figure 4.1: Fitted values of Tradable to Non-tradable ratio for the SA region**



**Table 4.8: Mean Group (MG) and Pooled Mean Group (PMG) estimation results**

<b>Dependent variable: Tradable to Non-tradable output ratio</b>		
<b>Explanatory variables</b>	<b>Mean Group</b>	<b>Pooled mean group</b>
	<b>Long-run coefficients</b>	
Remittance to GDP ratio	-0.036 (-2.65)***	-0.016 (-2.96)***
Aid to GDP ratio	-0.044 (-1.01)	0.011 (3.68)***
Government Expenditure to GDP	0.11 (0.09)	-0.020 (-0.06)
Terms of trade	-0.00002 (-0.01)	0.001 (1.86)*
M2 to GDP ratio	-0.80 (-1.43)	-0.342 (-1.89)*
Trade openness (X+M/GDP)	0.616 (1.97)**	0.139 (1.91)*
Capital formation to GDP ratio	0.002 (0.40)	0.002 (0.93)
<b>Short-run coefficients</b>		
<i>Error Correction Coefficient</i>	-0.593 (-2.42)**	-0.133 (-1.75)*
$\Delta$ Remittance to GDP ratio	0.012 (0.80)	-0.003 (-0.73)
$\Delta$ Aid to GDP ratio	0.014 (0.98)	0.003 (0.37)
$\Delta$ Government Expenditure to GDP	-0.055 (-0.06)	-0.660 (-0.88)
$\Delta$ Terms of trade	-0.00004 (-0.01)	-0.0002 (-0.68)
$\Delta$ M2 to GDP ratio	-0.021 (-0.24)	-0.077 (-0.87)
$\Delta$ Trade openness	-0.071 (-0.77)	0.014 (0.23)
$\Delta$ Capital formation to GDP ratio	0.001 (0.19)	-0.001 (-0.39)
$\Delta$ Capital formation to GDP ratio (lagged)	0.0006 (0.17)	-0.002 (-1.67)*
Constant	0.479 (2.01)**	0.083 (1.99)**
Number of Observations ( $N \times T$ )	173	173
<b>Hausman test:</b>	$\chi^2$ Coefficient	144.99
Ho: Common Coefficients (MG and PMG)	Tail Probability	0.000

Notes: 1) \*, \*\*, \*\*\* Indicates significance at 10%, 5%, and 1% respectively. 2) Z-statistics in the parenthesis

## **CHAPTER 5**

### **CONCLUSION**

This dissertation examined both microeconomic and macroeconomic dynamics of remittances using a regional approach. From a microeconomic perspective, the determinants of the incidence of remittance for Canadian immigrants from the South and South East Asian region were investigated. From a macroeconomic perspective, this study first analyzed the economic growth impact of remittances, taking all non-market financial flows towards 46 developing countries within a single framework. In addition, two very significant components of foreign aid, concessional loans and grants, were computed separately within the model to investigate the comparative effectiveness of these flows on economic growth. Second, the dissertation examined long-run exchange rate dynamics in the presence of a large inflow of remittances towards a group of South and South East Asian countries. Results from each essay in the dissertation brought significant policy implications.

The first essay sought to determine motivations to remit, taking into account a holistic approach. Socioeconomic (age, sex, marital status, country of origin, cities where the remitters resided in the host country), financial endowment (income and education), and other non-income determinants (family size, dwelling structure, group activity involvement) were considered in determining the probability of remittance incidence. The essay deviated from the conventional empirical findings for motivation to remit in a few cases, especially for income. It was found that higher

income immigrants have fewer incidences of remittances. This is perhaps due to the fact that all these immigrants are permanent residents with perhaps a vested interest to settle in Canada. It is not surprising that an individual would tend to spend more when his/her income increases in order to enjoy the Canadian life. Although it is expected that an individual motivated by *self interest* would send more money with increasing income, this essay concluded that *self interest* was not at work in determining the incidence of remittance. The education variable supported the view of *enlightened self-interest* motivations to remit, as a higher level of education is associated with a higher probability of remitting. It might be the case that remittances are mostly driven by the motivation of securing status and sponsoring family members to reunite in the host country. Those respondents who lived in bigger cities had a higher probability of remitting when compared with respondents who lived in smaller cities. This is perhaps due to bigger cities offering better opportunities, more community involvement, and better corridors for transferring money. The study has policy implications as regional findings departed from some of the conventional findings in the prevailing literature. Some have argued that motivation to remit is either *altruistic* or *self interest* in nature (Sander, 2003; Sana & Massey, 2005). However, this study revealed that pure a *self interest* motivation might not work for the case of permanent settlers. These results are also important for Canadian policy-makers in order to better understand labour market dynamics related to immigrants and their motivations to remit.

The second essay examined the comparative effectiveness of non-market financial flows, specifically the effect of remittances, grant-aid and concessional

loans on economic growth. Estimations on 46 countries and three regional estimations (Asia, Africa and Latin America) were conducted. Overall the results indicated that remittance flows are the most significant channel through which positive economic growth is achieved. The second most important flow was the grant-aid component of foreign aid. However, growth in concessional loans was found to be insignificant, suggesting that the growth rate of GDP is not associated with this. In terms of regional regressions, the results for Africa were similar to the general results. For Latin America, all components of non-market financial flows (remittances, grant-aid and loans) positively and significantly affected economic growth. For Asia, only remittances were found to be significant. This essay has implications for policy-makers. As the public and private transfer components of non-market financial flows were found to be the most significant channels affecting economic growth positively, the governments of these countries should formulate policies to promote these flows. Tax relief on remittance-related income and the creation of investment opportunities might be worth considering as policy options. The essay also opened up avenues for future research. It would be interesting to compare estimations that account for income variations. Different income groups might behave differently in terms of utilizing external financial resources to achieve higher economic growth.

The third essay focused on estimating long-run exchange rate dynamics in the presence of high volumes of remittance flows towards six South and South East Asian countries. Both *spending* and *resource movement* components of the ‘*Dutch Disease*’ framework were examined by using mean group (MG) and pooled mean group (PMG) estimation techniques. A strong homogeneous currency appreciation

was observed for this set of countries. In terms of the *resource movement effect*, the study revealed that remittances significantly promoted the expansion of the non-tradable goods sector at the expense of the tradable goods sector. However, the process was found to be heterogeneous across panel. In the face of a voluminous inflow of remittances, governments could implement policies in favour of the export sector expansion. For instance, they could devise mechanisms so a higher proportion of remittances are channeled towards investment as opposed to consumption. Governments could also directly intervene in the export sector through the establishment of export processing zones. However, extensive country specific research is warranted to fully grasp the consequences and outcomes of such policy interventions.

## ***REFERENCES***

- Sana, M. & Massey, D.S. (2005). Household Composition, Family Migration, and Community Context: Migrant Remittances in Four Countries. *Social Science Quarterly*, 86(2), 509–28.
- Sander, C. (2003). *Migrant Remittances to Developing Countries: A Scoping Study Overview and Introduction to Issues for Pro-poor Financial Services*. Prepared for the UK Department of International Development (DFID), Bannock Consulting.