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Workers' Remittances, Economic Growth and Poverty in Developing Asia and the Pacific Countries

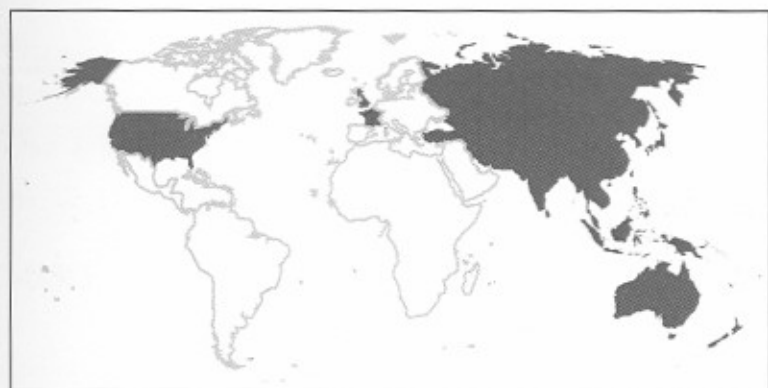
Juthathip Jongwanich



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January 2007

Abstract

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This paper examines the impact of workers' remittances on growth and poverty reduction in developing Asia-Pacific countries using panel data over the period 1993-2003. The results suggests that, while remittances do have a significant impact on poverty reduction through increasing income, smoothing consumption and easing capital constraints of the poor, they have only a marginal impact on growth operating through domestic investment and human capital development.

JEL Classification Numbers: O10, O40, O53

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1. INTRODUCTION

International remittance inflows have experienced a significant increase in developing countries over the past decades. For many developing countries, such remittances constitute the largest source of foreign exchange earnings, even exceeding export revenues, FDI, aid, or other private capital flows. Remittances become, therefore, a relatively attractive source of foreign earning for developing countries. However, little attention has been paid to analyze economic impact of these financial transfers, especially on economic growth and poverty. While remittance inflows are relatively stable and could positively affect economic growth and reduce poverty, the rapid increase in such inflows could generate the adverse effects to the overall economy, retarding the economic growth, i.e. the 'Dutch Disease' problem.

Empirical evidence of previous studies of the impact of workers' remittances on economic growth as well as poverty reduction is mixed. Stark and Lucas (1988); Taylor (1992); and Faini (2002) find the positive relationship between remittances and economic growth. The recent studies, i.e. Chami *et.al* (2003) and IMF (2005) found negative and no impact, respectively. The negative impact found in the former is based on 113 cross-countries study while the latter focuses on experience of 101 developing countries. Likewise, while Stahl (1982) finds that remittances would not benefit the poor, Adams and Page (2005) and IMF (2005) find positive and significant impacts of remittances on poverty reduction.

More importantly, these studies except IMF (2005) are based on the inter-country cross-sectional analysis. Cross-sectional regression analysis is based on the implicit assumption of 'homogeneity' in the observed relationship across countries. This is a very restrictive assumption because there are considerable differences across countries in relation to various structural features and institutional aspects, which have a direct bearing on the remittance-growth relationship. Despite undertaking the panel analysis, IMF (2005) estimates are very likely to be subject to the endogeneity problem because of the inappropriate instrumental variables.

Therefore, this paper aims to examine the impacts of remittances on economic growth and poverty, using panel data set of developing Asia and the Pacific countries during the period 1993-2003. The developing Asia and the Pacific countries are chosen mainly because over the past three decade, these countries have experienced a major increase in remittance inflows, and currently accounts for the bulk of total remittance receipts, compared with other regions. For many countries, remittances constitute the largest source of foreign exchange earnings and represent more than 10 per cent of GDP. Better understanding such impacts could help policymakers to design appropriate policies involved with the flows of remittances.

This paper contributes to the existing literature into two ways. First, we broaden the scope of study by examining impacts of remittances on both economic growth and poverty reduction. The inclusion of poverty was motivated by the recent shifts in emphasis of the international development community that in recent years have focused on 'poverty reduction', as opposed to economic growth, as the overarching goal of economic development. Second, over and above estimating impacts of remittances, we investigate the key channels of how remittances affect economic growth and poverty, which are usually ignored in the previous studies.

Understanding the channels is matter in formulating sensible policy in enhancing the developmental impact of remittances.

The rest of the paper is structured as follows. Section 2 provides an overview of trends and patterns of remittances in the developing Asia and the Pacific. The channels through which remittances affect economic growth and poverty are discussed in Section 3. The empirical model is analyzed in Section 4. Section 5 presents and analyses results. The final section summarizes key inferences and provides policy recommendations. The database and the econometric procedures are described in Appendix.

2. REMITTANCES IN THE DEVELOPING ASIA AND THE PACIFIC: A FIRST LOOK

Broadly, remittances are thought of as unrequited transfers, sent by migrant workers back to relatives in their country of origin. Based on the IMF's *Balance of Payments Yearbook*, there are three components generally mentioned as constituting remittances, namely compensation of employees (part of the income component of the current account), worker's remittances (part of current transfers in the current account) and migrants' transfer (part of the capital account). Workers' remittances are current private transfers from migrant workers who are considered *resident* of the host country to recipients in their country of origin. If the migrants live in the host country for a year or longer, they are considered *residents*, regardless of their immigration status. If the migrants have lived in the host country for less than a year, their entire income in the host country should be classified as compensation of employees. Migrants' transfers include financial items that arise from the migration (change of residence) of individuals from one economy to another.

However, the quality and coverage of data on remittances are still subjected to limitations. Firstly, due to the difficulty in classifications, in several countries such as Malaysia and China, other current transfers and transfers from other sectors are also classified as workers' remittances. In some countries, remittances are often misclassified as export revenue, tourism receipts, non-resident deposits, or even foreign direct investment (FDI). Secondly, in several countries, many types of formal remittances flows go unrecorded, due to weakness in data collection. Reporting of small remittance transactions made through formal channels is not mandatory in most countries and remittances sent through post offices, exchange bureaus, and other agents of money transfer operators (MTOs) are often not reflected in official statistics. Thirdly, flows through informal channels such as unregulated money transfers firms or family who carry remittances are rarely computed. If remittances sent through informal channels are included, total remittances could be as much as 50 per cent higher than the official record (World Bank, 2006).

Over the past decade, remittance inflows in developing countries significantly increased to US\$160 billion in 2004 from US\$31.2 billion in 1990. On average during this period, remittance inflows grew annually by 17.1 per cent. The remittances become an important source of foreign exchange earning. This is reflected by the fact that remittance growth has outpaced private capital inflows and official development assistance over the last decade (Table 1). In 2004, the

remittance receipts were close to the flows of foreign direct investment (FDI) while were larger than official development assistance and private equity (non-FDI) flows.

In the absolute terms, the developing Asia and the Pacific countries have experienced a major increase in remittance inflows and currently account for the bulk of total remittance receipts, followed by Latin America and Africa regions (Table 2). During the period 2001-04, remittance inflows in Asia and the Pacific region increase by 21.3 per cent while those in Latin America and Africa increase by 19.3 and 18.9 per cent, respectively.

Table 1: Official remittances in developing countries in the world (US\$ billion)

	1995	2004
Workers' remittances	58	160
Foreign direct investment	107	166
Private debt and portfolio equity	170	136
Official development assistance	59	79

Source: World Bank (2006)

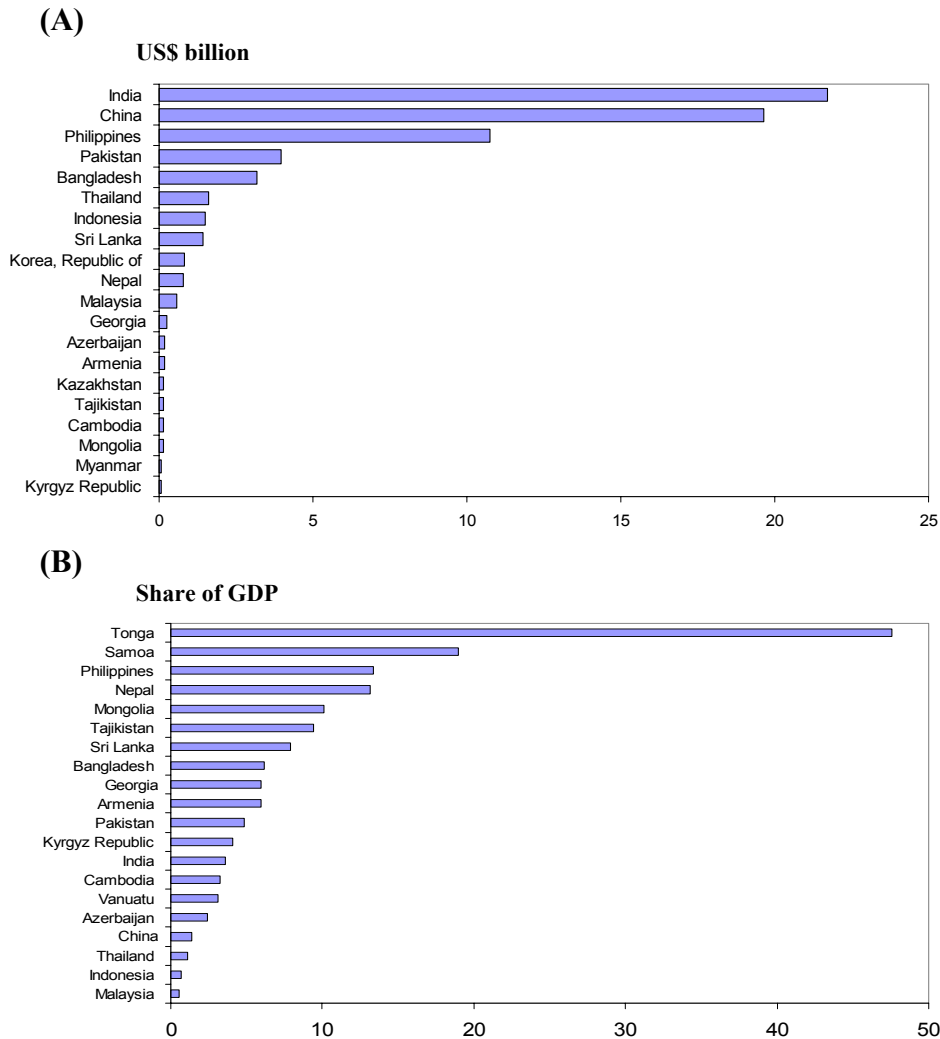
Table 2: Workers' remittances to developing countries, 1990-2004 (US\$ billion)

	1990	1995	2000	2001	2002	2003	2004	Average Annual Changes 1990-2004
Developing countries	31.2	57.8	85.6	96.5	113.4	142.1	160.4	17.1
- Asia and the Pacific	8.9	22.4	35.7	41.3	53.6	69.3	76.4	21.3
- Latin America	5.8	13.4	20.1	24.4	28.1	34.8	40.7	19.3
- Middle East	10.8	10.2	11.2	9.7	11.3	13.2	14.8	8.2
- Europe	3.2	5.4	11.6	11.0	11.1	12.7	15.3	7.6
- Africa	2.5	6.4	6.9	10.1	9.5	12.2	13.2	19.0
World (developing & industrial)	68.6	101.6	131.5	147.1	166.2	200.2	225.8	14.5

Source: IMF's Balance of Payments Yearbook CD-ROM (January 2006).

Among Asia and the Pacific, more than 40 per cent of workers' remittances flow into South Asia region, followed by East Asia (30 per cent) and Southeast Asia (22 per cent). The five single largest recipients of remittances in Asia and the Pacific region in 2003 were India, China, Philippines, Pakistan, and Bangladesh (Figure 1A). Where a ratio of remittances to GDP is concerned, small countries like Tonga and Samoa experience the highest ratio, followed by Philippines, Nepal and Mongolia (Figure 1B). The ratio in these five countries was more than 10 per cent of GDP in 2003. In these countries, remittances are also very large relative to other sources of foreign exchange such as exports or aid. Note that the United States, Canada, the United Kingdom, France, Saudi Arabia and the Gulf States are the largest sources of remittances for developing countries in Asia and the Pacific region.

Figure 1: Top 20 remittance-recipient developing countries in Asia and the Pacific, 2003

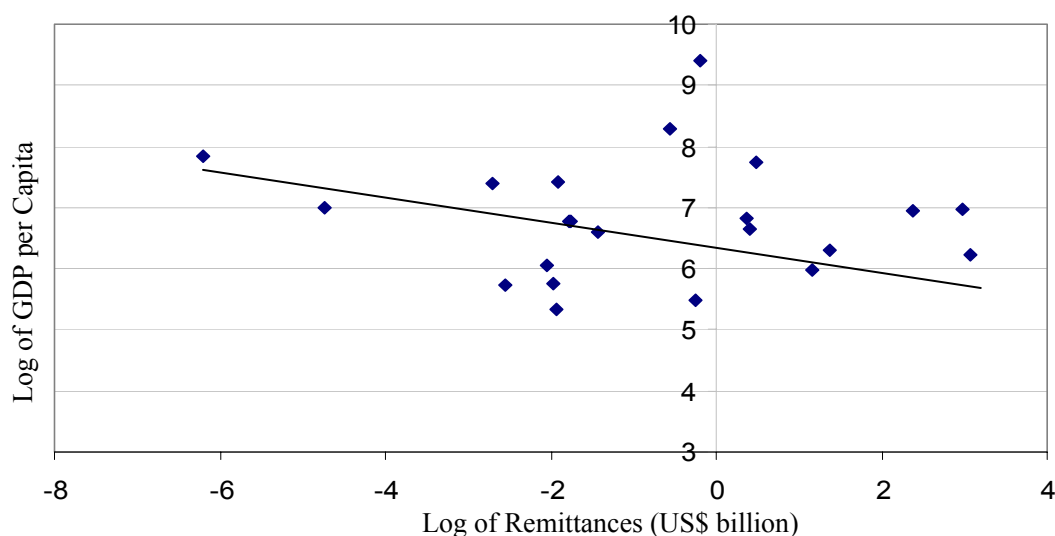


Source: Author's calculation from IMF's Balance of Payments Yearbook CD-ROM (January 2006) and World Development Indicator CD-ROM (2005).

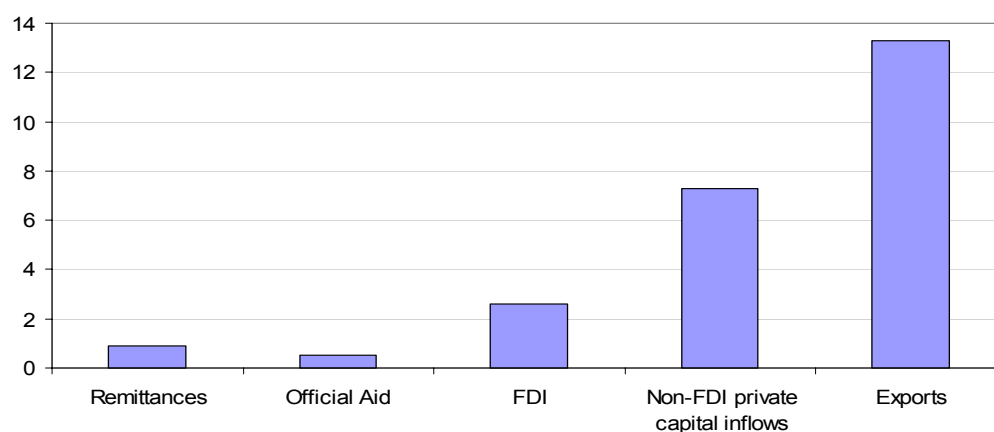
Note that there are two key characteristics related to movements of remittances in the Asia and the Pacific countries. First, when we plot remittances with GDP per capita, the negative relationship seems to emerge. This implies remittances tend to move countercyclically relative to the country's income (Figure 2B). Second, from our calculation on volatility, remittances in the Asia and the Pacific region are relative stable source of external finance, compared with exports and non-FDI private capital inflows. Throughout the 1990s, the standard deviations of the ratio of remittances to GDP are around 0.88 while that of exports and non-FDI private capital inflows are 7 and 13, respectively (Figure 2B).

Figure 2: Volatility and Cyclicality of Remittances in Asia and the Pacific Countries

(A) The relationship between GDP per capita and Remittances in 2003



(B) Volatility of Remittances in 1990s



Note: Volatility is defined as the standard deviation of the ratio of the relevant inflows to GDP

Source: Author's calculation.

3. REMITTANCES, GROWTH AND POVERTY

There is little agreement and scant information in the literature concerning the impact of international migration and remittances on economic growth. Workers' remittances can positively affect growth through a number of channels. Firstly, remittances may reduce credit constraint of household receipts so that entrepreneurial activity and private investment could increase (Yang, 2004; Woodruff and Zenteno, 2004). Households in developing countries confront much less efficient credit and financial markets so that access to credit markets seems to be their biggest concerns. Remittance inflows could help households to set up their entrepreneurial activity.

Over and above physical investment, remittances could also help to finance education and health, which are also key variables in promoting (long-term) economic growth.

Secondly, remittances could improve a country's creditworthiness and thereby enhance its access to international capital markets. World Bank (2006) points out that the calculation of country credit ratings by major international also depends on its magnitude of remittance flows. The higher the magnitude of remittance flows the better the credit rating rank the country could reach. This is another way to increase both physical and human capital investment, thereby enhancing economic growth.¹ Thirdly, remittance inflows could generate positive effects to economic growth through multiplier-effect mechanisms. While there are backward and forward linkages in investment activities, an increase in investment of one household could generate an increase in income to other household. In the context of increasing returns, the expansion of one sector could increase the optimal size of other sectors.

Many studies point out the positive relationship between household investment and workers' remittances in developing countries. For example, Brown (1994) investigates the relationship between remittances, savings and investment in Tonga and Samoa basing on micro-level analysis of the use of remittances by households. It is found that remittances make a significant contribution to savings and investment in the island economies. Mesnard (2004) examines impacts of remittances on Tunisia using a life-cycle model and finds that workers who have limited access to the financial market tend to use such remittances to invest. Yang (2004) shows that remittances lead to improved child schooling, reduce child labour, increased education expenditure, and facilitate investment. Stark and Lucas (1988); Taylor (1992); and Faini (2002) find the positive relationship between remittances and economic growth.

However, there are some concerns whether remittances could have significant and positive impact on economic growth. Firstly, a number of studies (Stark and Levhari, 1982; Ahlburg, 1991) point out that primary use of remittances has been for consumption with the remainder being used for house construction, debt repayment and the financing of future migration. According to this view, remittances have raised levels of consumption without creating a firm basis within the domestic economy. Even though remittances may increase investment, insurance provided by distant migrants tends to allow source households to engage in riskier income-generating investment activities (Stark and Levhari, 1982). The lack of investment in productive activities casts doubt on the role of remittances in generating economic growth.

Secondly, remittances could also indirectly affect labour supply by encouraging some remittance-recipient households to work less. This could reduce labour supply and reduce economic growth. Remittance transfers take place under conditions of asymmetric information in which the remitter and recipient of the transfer are separated by long distances. This could lead to significant moral hazard problems where the latter is likely to be reluctant in participating in labour market, limiting their job search, and reducing labour effort (Chami *et al.*, 2003). Based on

¹ Note that the rate of investment of remittance income tends to be high when remittance flows are viewed by household as transitory rather than permanent and thus should be saved rather than spent. The sender conditions the remittance on it being spent for particular purposes, which are more likely to involve investment.

aggregate data on remittances of 113 countries over 29 years, Chami *et al* (2003) find that remittances have negative impacts on economic growth.

Thirdly, large and sustained remittance inflows could cause an appreciation of the real exchange rate and make the production of tradable goods sector less profitable (or the so called 'Dutch Disease' problem). Amuedo-dorants and Pozo (2004) test the impact of workers' remittances on the real exchange rate using a panel of 13 Latin American and Caribbean countries. The analysis reveals that workers' remittances have the potential to inflict economic costs on the export sectors of receiving countries by reducing their international competitiveness.

In terms of poverty, remittances could directly reduce poverty by increasing income of the recipients. Such increased income could play a significant role in increasing and smoothing consumption of the poor. Thus, regardless its impact on economic growth, such increased and smoothed consumption could raise poor households' standard of living and alleviate poverty. In addition, while remittances could relax working capital constraints so that both physical and human capital investment of the poor could increase. Adams and Page (2005) examine impacts of remittances on poverty in 71 developing countries. The results show that both international migration and remittances significantly reduce the level, depth and severity of poverty in these countries. However, there are some concerns that remittances would not benefit to the poor. In particular, Stahl (1982) argues that because the international migration can be an expensive venture, it is going to be the better-off households who will be more capable of producing migration and sending remittances. While poor households would not get the benefit from such remittance flows, they tend to generate inequality so that poverty tends to eventually increase.

4. EMPIRICAL MODEL

4.1 ECONOMIC GROWTH

The model to investigate the role of remittances on economic growth is based on the extended version of the neoclassical model (Barro, 1996). Within this framework, the growth equation can be expressed as follows:

$$g_{it} = c_0 + c_1 Y_{i,t-1} + c_2 H_{it} + c_3 I_{it} + c_4 Remit_{it} + c_5 X_{it} + \eta_i + \varepsilon_{it} \quad (1)$$

where g is economic growth, Y_{t-1} is the initial GDP per capita, H is the human capital, I is the investment, $Remit$ is remittances, A is a set of choice and environmental variables that affect economic growth, η is an unobserved country-specific effect and ε_{it} is the error term. Basing on Barro (1996), Barro and Sala-i-Martin (1995) and Giuliano and Ruiz-Arranz (2005), other variables (A) includes government consumption (Gov), openness ($Open$), and inflation (Inf).

The coefficient associated with remittances is ambiguous as discussed in the previous section. The coefficient on the initial GDP (c_1) is expected to be negative, representing a conditional rate of convergence. Under diminishing returns to capital situation and *ceteris paribus*, we expect the poorer countries to grow faster than the richer countries because such diminishing returns imply that each addition to the capital stock generates large additions to output when the capital stock is small to

begin with (the poorer countries). The opposite is true when the capital stock is large initially (the richer countries).

As the key factor inputs in growth process, we expect the positive impact of human capital and investment on output growth.² As reviewed in literature³, openness is desirable for promoting economic growth. It will help to allocate resources efficiently, to spur innovation and entrepreneurial activity resulting from competition and access to larger markets, and to reduce the rent seeking activities inspired by trade restriction so that we expect the positive relationship between trade openness and economic growth.

By contrast, we expect the negative coefficients relating to government consumption and inflation. The government consumption is an approximate measure of government spending in non-productive so that an increase in this variable tend to generate negative impacts on economic growth. Higher inflation tends to reduce real money balances thereby subjecting private agents to larger transaction costs. In addition, higher inflation is often viewed as key symptoms of macroeconomic stability, which reflects weakness in macroeconomic management. Such instability hampers private investment and saving decisions, thereby leading to an inefficient allocation of resources. All in all an increase in inflation tends to have a negative impact on economic growth.

4.2 POVERTY

There is not much guidance available from theory regarding the appropriate specification for the poverty determinants. However, basing on recent cross-country empirical works on poverty (Dollar and Kraay, 2002 and Berg and Krueger, 2003), we postulate a poverty equation as follows:

$$Pov_{it} = \beta_0 + \beta_1 g_{it} + \beta_2 In_{it} + \beta_3 Remit_{it} + \beta_4 X_{it} + \eta_i + \varepsilon_{it} \quad (2)$$

where Pov is the poverty measure, g is the economic growth, In is the inequality, $Remit$ is remittances and X is the control variables. The control variables (X) include human capital (H), inflation (Inf), and openness ($Open$).

As mentioned in the previous section, β_3 could be both positive and negative and we are interested in testing whether the impact of remittances on poverty reduction is statistically significant. For other control variables, the negative coefficient of β_1 is expected while income of the poor tends to grow proportionally with per capita growth. The worsen income distribution and an increase in inflation tend to have a negative impact on poverty reduction so that their coefficients are expected to be positive. While an increase in human capital factor increases opportunity of the poor to generate income, the coefficients associated with these variables are expected to be positive.

The coefficient associated with trade openness to poverty reduction is ambiguous (Berg and Krueger, 2003). On the one hand, trade liberalization could

² Since reliable data series on capital stock are not available, the gross fixed capital formation is employed to represent the capital stock.

³ See the recent survey in Berg and Krueger (2003).

benefit the poor at least as much as the average person. Trade liberalization could increase the relative wage of low-skilled workers and reduce monopoly rents and the value of connections to bureaucratic and political power. On the other hand, trade liberalization might also worsen the income distribution, particularly by encouraging the adoption of skill-biased technical change in response to increased foreign competition. Thus, if trade liberalization worsens the income distribution enough, particularly by making the poor poorer, then it is possible that it is not after all good for poverty reduction, despite its positive overall growth effects. A number of empirical studies using panel and cross-section data (e.g. Edwards, 1997; Ghura *et al.*, 2002; Dollar and Kraay, 2004) found no link between openness and the well-being of the poor beyond those associated with higher average per capita income growth.

5. ESTIMATION RESULTS

This section presents estimates of the parameters in growth and poverty equations. For the growth equation, it shows that when other things being equal, the direct impacts of remittances on growth is nil, i.e. negative but statistically insignificant (Table 3 column A). Nonetheless, as discussed earlier, remittances might have indirect impact on economic growth as a result of easing household credit constraint that allows domestic investment and human capital development to expand. To solve this argument, we estimate separate equations of impacts of remittances on investment and human capital (Table 3 column B and C).⁴

The positive and statistical significance of coefficients associated with remittances is found in both human capital and investment equations. An increase in remittances 1 per cent is associated with an increase in human capital by 0.008 per cent and investment by 0.03 per cent. These results suggest that remittances can alleviate credit constraint and positively affect private investment. Where the impact on human capital is concerned, remittances seem to be used to finance education and health so that human capital is improved.

While remittances can generate positive impacts on economic growth through investment and human capital channels, their impacts are marginal. An increase in remittances 1 per cent is associated with an increase in economic growth by only 0.03 per cent (Table 4). The marginal impact suggests that the government should not regard remittances as the key instrument on par with traditional growth engines like export and foreign direct investment (FDI).

Note that other variables in growth equation are statistically significant and have expected sign. The negative coefficient associated with initial income support the conditional convergence hypothesis where the poor economies tends to grow faster than rich economies, once the determinants of their steady state are held constant. The positive and significant coefficient of openness points out that trade liberalization is useful policy to Asian and the Pacific countries in promoting

⁴ Note that for human capital equation, we estimate log of human capital on log of initial income and log of remittances using fixed effects transformation. For investment equation, log of investment is a function of its own lag, log of economic growth, log of remittances, log of real interest rate, log of inflation to capture uncertainty and log of degree of openness, using the panel system *Generalized Method of Moments* (GMM) regressions.

economic growth. By contrast, an increase in inflation and government consumption tends to retard (long-term) economic growth.

Where poverty equation is concerned, we found that an increase in remittances can directly lead to poverty reduction. Other thing being equal, an increase in remittances 10 per cent leads to a reduction in poverty incidence by 2.8 per cent (Table 3 column D). This result shows that remittances can directly increase income of poor people, smooth household consumption and ease capital constraints. Over and above the direct impact, remittances can have indirect effect on poverty reduction since they can affect economic growth and human capital (see Table 3), both of which are key determinants of poverty equation. Hence, an increase in remittances of 1 per cent can totally alleviate poverty incidence by 0.43 per cent.

As mentioned in Section 3, there is concern that remittances could induce income inequality. This is because the international migration can be an expensive venture so that it is going to be the better-off households who will be more capable of producing migration and sending remittances. While poor households would not get the benefit from such remittance flows, they tend to generate inequality so that poverty could eventually increase. However, the coefficient associated with inequality tends to be less than that of growth and human capital so that the negative impacts from inequality are unlikely to dominate positive impacts arising from growth and human capital.⁵ Note that the relatively low coefficient associated with inequality in poverty equation is also pointed out by Berg and Krueger (2003).

This result rather suggests that remittances could generate incomes even for families who receive no remittances at all mainly through the multiplier effects of expanded spending. As migrants' families increase their consumption of services or goods produced in sectors with excess capacity, the additional demand can create jobs for other families who in turn spend and create further demand. Thus, such multiplier effect could lead to poverty reduction even some poor families do not directly get remittance inflows.

In terms of empirical evidence, impacts of remittances on inequality are mixed in this region. For example, in Pakistan, Lucas (2005) argues that remittances probably contributed in a significant way to poverty alleviation process because many of migrants were relatively poor, possessing little or no education and coming overwhelmingly from rural areas. This finding is to some extent consistent with that by Ilahi and Jafarey (1999) who illustrate that the benefits of remittances to Pakistan have been distributed beyond the immediate family. However, as argued by Adams (1998), although poverty may well have been reduced by the process of emigration and remittances, the poorest appear to have been bypassed, at least directly. Among his sample of rural families, the richest 20 per cent of household derived nearly 14 per cent of their incomes from international remittances while they were source of only 1 per cent of income for the poorest 20 per cent of families.

⁵ Note that we also undertake panel regression to examine the role of remittances on inequality where log of Gini coefficient is a function of log of economic growth and remittances. We found the positive and statistical significance of remittances on inequality but the impacts is marginal. An increase in remittances 1 per cent is associated with an increase in inequality by 0.01 per cent.

In terms of Philippines, Rodriguez (1996) and Saith (1997) pointed out that in contrast to other parts of Asia, most of the overseas workers in the Philippines originate from the urban, relatively affluent communities. Households with higher average incomes and education receive large remittances. Moreover, even within regions there is evidence to indicate that the fraction of income derived from foreign remittances is greater at the upper deciles of family incomes. The bottom five deciles account for a paltry share of remittances (i.e. less than 5 per cent) whereas the top decile alone accounts for a staggering 55.71 per cent. Where the top twenty per cent of the families are considered, their share rises to 76.71 per cent of all receipts from overseas. Hence, remittances seem to increase inequality in the Philippines

Other controlling variables, i.e. human capital, economic growth, income inequality and inflation, reach the theoretical expected sign and statistical significance. Interestingly, the estimated coefficients corresponding to economic growth and human capital are relatively large, comparing to those associated with other determinants. This supports the hypothesis pointed out by Berg and Krueger (2003) that emphasize promoting economic growth and improving human capital development as the key strategy in reducing poverty incidence.

Table 3: Growth, Investment, Human Capital, Poverty and Remittances, 1993-2003

	Growth (<i>g</i>)	Investment (<i>I</i>)	Human capital (<i>H</i>)	Poverty (<i>Pov</i>)
Initial income ($Y_{i,t-1}$)	-0.58 (2.52)*		0.06 (9.93)*	
Growth (<i>g</i>)		2.73 (2.77)*		-3.16 (-2.09)**
Human capital (<i>H</i>)	2.56 (1.82)**			-7.64 (-3.05)*
Investment (<i>I</i>)	0.19 (1.26)***			
Lag investment (I_{t-1})		0.74 (7.27)*		
Openness (<i>Open</i>)	0.10 (1.20)***	0.17 (1.96)**		
Government consumption (<i>Gov</i>)	-0.23 (-2.31)*			
Inflation (<i>Inf</i>)	-0.67 (-2.13)**	0.25 (0.79)		3.33 (2.67)*
Remittances (<i>Remit</i>)	-0.01 (-0.24)	0.03 (1.20)***	0.008 (6.47)*	-0.28 (-3.16)*
Inequality (<i>In</i>)				1.05 (4.73)*
Real interest rate (<i>r</i>)		-0.74 (-3.59)*		
Constant	-	-	0.11 (2.79)*	31.95 (2.83)*
Number of obs.	68	68	68	52
Serial correlation	0.91	0.84	0.12	0.27
Sargan test	0.14	0.18	-	1.00

Note: All variables are in logarithm formula. T-statistics are reported in parentheses with *, **, *** denoting significance at 1, 5, and 10 per cent, respectively.

Table 4: Impacts of One Per Cent Increase in Remittances on Growth and Poverty

	Direct Impact	Indirect Impact			Total
		Human	Investment	Growth	
Growth	0.00	0.02	0.01		0.03
Poverty	-0.28	-0.06		-0.09	-0.43

Source: Author's calculation

6. CONCLUSIONS AND POLICY RECOMMENDATIONS

This paper examines the impacts of remittances on growth and poverty in the selected Asian and the Pacific countries. It is unique in the existing literature in terms of the well-defined functional form and mechanism channels, and the more appropriate econometric treatment. Growth, investment, human capital and poverty equations are estimated, using data during the period 1993-2003. We employ the panel system *Generalized Method of Moments* (GMM) regressions in growth and investment equations to control for the endogeneity problem that arises from including lag independent variables. For human capital and poverty equations, instrumental fixed effects transformation is applied.

There are two key findings from the paper. Firstly, remittances seem to have a positive but marginal impact on economic growth in Asia and the Pacific countries through the improvement of domestic investment and human capital. Secondly, remittances have a significant direct impact on poverty reduction through increasing income, smoothing consumption and easing capital constraints of the poor.

The policy inference is that remittances should not be regarded as the key instrument on par with traditional growth engines like exports and foreign direct investment (FDI) in promoting long-term economic growth and country's prosperity. However, while remittances could have a significant impact on poverty reduction, governments in destination and origin countries should aim to sharpen the impacts of such international flows, particularly to the poor people.

Two key policy schemes are needed to sharpen such impacts. Firstly, government needs to have the policy scheme that aims to enhance the amount of remittances, particularly through formal channel. There is evidence that at around 50 per cent of remittances are under recorded and through informal channel (World Bank, 2006). These informal networks of money dealers commonly offer speedier and cheaper means of transfer than going through the formal channels. However, a number of concerns have been expressed with respect to the operation of the informal fund transfer system, ranging from financial smuggling, money laundering, potential links with terrorist funding, to macroeconomic consequences with respect to inappropriate exchange rate movement and tax collection.

Transaction costs in sending remittances remain high (IMF, 2005 and World Bank, 2006) so government should lower the costs and any barriers of official remittance channels to enhance the amount of remittances. Although there are other policies such as financial incentives offering premium exchange rates and interest rates to be used for enhancing the amount of remittances, these policies seem to have ambiguity impacts and limitations.⁶ Thus, to reduce such transaction costs, governments should promote competition and remove barrier to entry in the remittance market. For example, capital requirements on remittance services should be lowered. Formal financial intermediaries networks should be widened by allowing domestic banks from origin countries to operate overseas, and stimulating the participation of microfinance institutions and credit unions in providing low cost remittances services. Government should also support for the introduction of technology in payment systems. In particular, to increase the official remittances of the poor, partnerships between leading banks and the government post office network in countries that do not have banks with extensive branch networks in rural areas needed to be implemented.

Secondly, policy scheme should be emphasised toward how remittances will be used for productive activities. According to our econometric estimates, physical and human capital investments are two key channels through which remittances could generate the positive effects on economic development. Measures that encourage remittances to such investments would enhance its developmental impact. They can be undertaken in various forms. For example, government could develop appropriate training/education programs to assist returning migrants or remittance receipts in making effective investment decision. In addition, the appropriate infrastructure should be developed to generate favourable investment climate and be complement investments out of remittances. Mexican experience would be a good example where their migrants form hometown associations raise funds for their communities of origin and spend to improve their infrastructure. Their contributions are matched by federal and state government.⁷

Note that it is not clear that using tax or exemption schemes to redirect the uses of remittances to more productive sector are warranted (Lucas, 2005). A number of countries have attempted to redirect remittance spending by taxing these remittances, but most of them have failed. For example, in 2002, Sri Lanka announced that it would impose a 15 per cent tax on the \$1.2 billion remittances received each year. However, it had to quickly withdraw the measure when there was a mass outcry. India and Pakistan have offered incentives for migrant workers who set up or expand business establishments. In India, preferential access to imports of capital goods and raw materials is given for such migrant workers while particular incentives for setting up units in backward areas, as well as permitting investments in

⁶ For example, using foreign currency accounts (access to foreign currency accounts with permission to repatriate) as a tool for stimulating remittances seem to have major limitations. This is because this policy will be attractive only to migrants belonging to professional and higher-skilled categories who relatively use formal sending channel. Thus, Puri and Ritzema (1999) pointed out that using financial incentives cannot address all factors that lead to the leakage of remittances into informal channel.

⁷ Migrant hometown associations remit an estimated \$60 million a year. See more details of this scheme in Migration News, July 1, 2003 at <http://migration.ucdavis.edu/mn/index.php>. Even though this scheme has apparently been quite successful in promoting infrastructure development, it raises issues with respect to inequality of these developments across communities (Lucas, 2005).

export processing zones are given for overseas Pakistanis. Even though both are intended to increase the rate of investment out of remittances, lowering the relative costs of capital may have biased expansion away from much needed job creation. Puri and Ritzema (1999: 15) pointed out that in any case, particularly in India, the available fragmentary evidence leads to insignificant impacts of such incentives.

Over and above such two key important policy schemes, government also needs to have better data collections in terms of both magnitudes and sources of remittances. Data on remittances in sometimes are scattered across overlapping categories and institutions. In some countries, remittances are often misclassified as export revenue, tourism receipts, non-resident deposits, or even foreign direct investment (FDI). Many types of formal remittances flows go unrecorded, due to weakness in data collection. Without such improvement, it will be difficult for policy makers to precisely examine and evaluate the impact of remittances.

APPENDIX DATA AND ECONOMETRIC PROCEDURE

DATA

To explore the relationship between remittances, growth and poverty in the Asia and the Pacific countries, we work with panel data during the period 1993-2003. Table AI and AII report the summary statistics and the bivariate correlations of regression variables. The major problem dealing with the panel data econometric analysis in this paper is to deal with incomplete data set. We start with 44 countries in the Asian and Pacific region. Out of total, only 17 countries have relatively complete data in terms of remittances, growth, poverty measures and other control variables. They are Armenia, Azerbaijan, Bangladesh, Cambodia, China, India, Indonesia, Kazakhstan, Korea, Malaysia, Maldives, Nepal, Pakistan, Philippines, Sri Lanka, Thailand and Tonga. Following the vast majority of cross-country empirical studies, we split the sample period 1993-2003 into four nonoverlapping three-year periods (except for the last period for which we average our data for only two year). We use three-year periods rather than a yearly basis to reduce business cycle fluctuations associated with data series. Therefore, the final data set contain 17 countries covering four sub periods with the sample size of 68 observations.

Remittances (*Remit*) are generally defined as the sum of three items in the IMF's Balance of Payment Statistics Yearbook 2006 (CD Rom), International Monetary Fund, which are compensation of employees (part of the income component of the current account), worker's remittances (part of current transfers in the current account) and migrants' transfer (part of the capital account). This is also the standard definition in the World Development Indicators and the Global Development Finance database of the World Bank. In Malaysia and China, other current transfers and transfers from other sectors are also classified as workers' remittances as pointed out in Global Economic Perspective (World Bank, 2006) that in these two countries, remittance inflows are included in these two items. *Remit* is defined as log level of remittances as a share of GDP.

The growth rate of output (*g*) is measured as the growth of the real per capita GDP in constant dollars. The initial per capita output (Y_{t-1}) is the log level of real per capita GDP in constant dollars at the beginning of each three year block in the panel. Investment (*I*) is measured as the log level of gross fixed capital formation in constant dollars as a share of GDP. The annual percentage change in the consumer price index is used to measure inflation (*Inf*), with an exception in Armenia, Azerbaijan and Cambodia where CPI series are not available. Hence, the GDP deflator is used to measure inflation. Government consumption (*Gov*) is measured as the log level of government consumption in constant dollars as a share of GDP while openness to international trade (*Open*) is defined as the log level of ratio of the sum of goods exports plus goods imports to total output. All these variables are obtained from World Development Indicator 2005 (CD ROM), World Bank.

Human development index (*H*), the new developed index of human capital by United Nations Development Programme (UNDP), is used here to represent the level of human capital development in each country. This index is a summary measure of three dimensions of human development; leading a long and healthy life (measured by life expectancy), being knowledgeable (measured by literacy and school enrolment),

and having a decent standard of living (measured by GDP per capital, PPP US\$). Data are available in every five years, starting in 1975. Hence, we use data in 1995 as representatives of both the periods 1993-95 and 1996-98. The higher the value, the greater the level of human development. This index can be obtained from <http://hdr.undp.org/statistics/data/indicators.cfm?x=16&y=1&z=1>.

Where poverty measure is concerned, we use poverty headcount ratio, which is defined as the share of the population below the poverty line. The poverty line is defined as 1\$ a day on PPP basis (consumption base). The choice of poverty line at \$1 is dictated by data availability and is widely used by several International Organizations such as United Nation, World Bank and Asian Development Bank in measuring poverty. In some countries, missing data in some years are replaced by the average value of data that are available from previous periods. Poverty measures are obtained from Millennium Indicators Database, United Nations (www.unstats.un.org/unsd/database)

To measure income inequality, Gini coefficient is used. Recently World Income and Inequality database, a joint project by UNDP, United Nations University and World Institute of Development Economic Research collect Gini coefficients available in various research works as well as provide the general assessment of constructed Gini coefficient quality. We make use of this data collection with certain criteria. Firstly, we choose Gini coefficient based on income. Even though the expenditure-based Gini coefficient is theoretically superior to that based on income, the choice in favor income base is due to the fact that most of countries have income-based Gini coefficients. Since our interest is the inter-country comparison, we need to maintain its consistency as much as possible. Hence the income-based Gini coefficient is our preferable choice. Nonetheless, there are few countries, i.e. Bangladesh, India, Indonesia, and Pakistan, in which expenditure-based are chosen because of data availability. Secondly, in some countries, there are more than one series of Gini coefficient available. We pick the series that cover our interested periods and receive the highest assessed quality. Finally, while data are not available on annual basic, we average out the available data series. Missing data in some years are replaced by the average value of data that are available from previous periods.

Table AI: Summary of Statistics

	Mean	Median	Maximum	Minimum	Std. Dev.	Number of Observations
Growth (<i>g</i>), (%)	3.53	3.37	14.12	-19.28	4.49	68
Human capital Index (<i>H</i>)	0.68	0.71	0.90	0.45	0.11	68
Investment (<i>I</i>), (% of GDP)	24.59	22.39	53.72	7.56	0.08	68
Openness (<i>Open</i>), (% of GDP)	82.17	75.20	220.29	21.20	44.75	68
Government consumption (<i>Gov</i>), (% of GDP)	11.95	11.55	23.92	4.64	0.05	68
Inflation (<i>Inf</i>), (%)	61.91	5.52	1886.55	-0.97	277.35	68
Remittances (<i>Remit</i>), (% of GDP)	4.29	1.44	47.57	0.10	7.96	68
Inequality (<i>In</i>), (%)	39.22	37.05	50.80	27.50	7.20	52
Real interest rate (<i>r</i>), (%)	7.49	7.06	34.76	-18.88	7.30	62

Note: All variables are not in logarithm formula.

Table AII: Correlations of Variables of Interest

	<i>g</i>	<i>H</i>	<i>I</i>	<i>Open</i>	<i>Gov</i>	<i>Inf</i>	<i>Remit</i>	<i>In</i>	<i>r</i>
Growth (<i>g</i>)	1								
Human capital (<i>H</i>)	0.21	1							
Investment (<i>I</i>)	0.37	0.48	1						
Openness (<i>Open</i>)	0.07	0.59	0.20	1					
Gov. consumption (<i>Gov</i>)	0.29	0.55	0.23	0.29	1				
Inflation (<i>Inf</i>)	-0.06	0.00	-0.14	0.08	0.36	1			
Remittances (<i>Remit</i>)	-0.12	0.13	-0.41	-0.09	-0.09	0.08	1		
Inequality (<i>In</i>)	0.21	0.59	0.25	0.61	0.36	-0.09	0.38	1	
Real interest rate (<i>r</i>)	0.29	-0.02	-0.11	-0.08	-0.16	-0.51	0.19	0.26	1

Source: Author's calculation

ECONOMETRIC PROCEDURE

For the growth equation (equation (1)), a panel system *Generalized Method of Moments* (GMM) technique is applied in order to deal with the presence of unobservable heterogeneity and lagged dependent variable as an explanatory variable in the model. Equation (1) can be rewritten in terms of GDP per capita (*Y*) as follows:

$$\begin{aligned}
 Y_{it} - Y_{i,t-1} &= c_0 + c_1 Y_{i,t-1} + c_2 H_{it} + c_3 I_{it} + c_4 Remit_{it} + c_5 X_{it} + \eta_i + \varepsilon_{it} \\
 \text{or } Y_{it} &= c_0 + c_1^* Y_{i,t-1} + c_2 H_{it} + c_3 I_{it} + c_4 Remit_{it} + c_5 X_{it} + \eta_i + \varepsilon_{it} \tag{3}
 \end{aligned}$$

where $c_1^* = (1+c_1)$ and *Y* is in logarithm formula. The usual solution to the problem of an explanatory variable being correlated with η is to eliminate the latter through a fixed effect transformation. However, applying this approach to a dynamic model such as (3) will generate an alternative source of bias. To illustrate, the first difference transformation of equation (3) is:

$$Y_{it} - Y_{i,t-1} = c_1^* (Y_{i,t-1} - Y_{i,t-2}) + \dots + \varepsilon_{it} - \varepsilon_{i,t-1} \tag{4}$$

While independent term (Y_{it}) in equation (3) is contemporaneously correlated with the error term (ε_{it}), this means lagged values of the dependent term will also be correlated with lagged values of the error term. In other words, in equation (4), the differenced lagged terms ($Y_{it}-Y_{i,t-1}$) is correlated with the differenced error term ($\varepsilon_{it}-\varepsilon_{i,t-1}$). Thus, if we estimate equation (3) by fixed effect, the estimated coefficient will be biased.

An estimation technique that addresses these problems is proposed by Arellano and Bond (1991), the panel system *Generalized Method of Moments* (GMM) regressions. The first step in this estimation procedure is to eliminate unobservable heterogeneity (η_i) by first differencing equation (1) and (2). The endogenous problems are addressed by using a second and higher order lags of these variables as instruments. This approach will be valid so long as there is no second order serial correlation, something which is tested in each specification. In addition, to ensure this approach is valid, a Sargan test of overidentifying restrictions, which assesses the contemporaneous correlation between the set of instruments and the residual, is reported with the results.

While there is no lag dependent variable in poverty equation, the fixed effects transformation is applied. To take into account the simultaneity problems that could

emerge between workers' remittances and poverty, we apply the instrumental technique along with the fixed effects transformation. To ensure this approach is valid, a Sargan test of overidentifying restrictions is also reported with the results.

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