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Remittances, Growth and Poverty: New Evidence from Asian Countries

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ABSTRACT

The present study re-examines the effects of remittances on growth of GDP per capita using annual panel data for 24 Asia and Pacific countries. The results generally confirm that remittance flows have been beneficial to economic growth. However, our analysis also shows that the volatility of capital inflows such as remittances and FDI is harmful to economic growth. This means that, while remittances contribute to better economic performance, they are also a source of output shocks. Finally, remittances contribute to poverty reduction – especially through their *direct* effects. Migration and remittances are thus potentially a valuable complement to broad-based development efforts.

Keywords: remittances, economic growth, volatility, poverty, Asia

JEL Codes: C23, F24, I32, O15, O47, O53

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1. Introduction

In 2010, migrants from developing countries sent over $325 billion to their origin countries, far exceeding the official development assistance received. This does not include the unrecorded flows. The increase in remittances to developing countries has been due to more number of people settling abroad, and easier, faster and cheaper modes of transmitting money to another country[1].

Empirical results on the impacts of migration on growth and poverty levels of a country are mixed. While the resulting remittances increase the income of the recipient country and consequently decrease poverty, there are social costs not accounted for in these higher incomes[2]. On the one hand, remittances reduce work efforts and dampen long term growth, and on the other, they improve financial sector development and thus stimulate growth. Remittances have a positive impact on the credit rating of a country, provide a large and stable source of foreign currency that can curtail investor panic, help deal with balance of payments crisis, and can be used for development projects (Ratha et al., 2011).

Remittances reduce poverty through increased incomes, allow for higher investments in physical assets and education and health, and also enable access to a larger pool of knowledge. Inflow of workers' remittances results in physical capital accumulation through increased access to finance, although this depends on the recipients' marginal propensity to consume. For

[1] Ttransfer fees have been falling since 2009, when the G8 group of rich countries promised to reduce them by five percentage points in five years. This has put more than $30 billion into migrants' pockets (*The Economist*, 25th May, 2013).

[2] These (remittances) also come at the risk of psychological stress and adverse emotional impact, both for the migrant as well as his/her family.

instance, in Nepal, one third to one half of the reduction in the poverty headcount ratio from 42 per cent in 1995-96 to 31 per cent in 2003-04 is attributed to the increases in remittances (World Bank, 2006). In rural Pakistan, temporary migration is associated with higher female and total school enrolment (Mansuri, 2006). On the other hand, migration of high skilled workers can result in a brain drain (Adams, 2003; Docquier et al. 2007) that could have a negative impact on the growth of the country in the long run.[3]

Many of Asia and the Pacific countries recently enjoyed a surge of remittances until the beginning of the global financial crisis and experienced economic growth as well as poverty reduction at the same time, but none of the studies, to our knowledge, have assessed the impacts of remittances on economic growth and poverty in these countries. The present study attempts to fill this gap. The objectives of the present study are (i) to assess the relationship between remittances and growth of GDP; (ii) whether volatility of remittances is harmful to growth; and (iii) whether remittances reduce poverty, and (iv) what sort of government policies can help the country promote growth and reduce poverty. The econometric methods we employ correct for endogeneity of remittances and other variables, and robust results are obtained, based on a cross-country panel of Asia and the Pacific countries.

The remainder of the paper is structured as follows. Section 2 discusses the impact of the financial crisis of 2008-09 on remittances. Section 3 reviews the recent literature on the relationship between remittances, economic growth and poverty. Section 4 is devoted to a review of the data and discussion of the econometric specifications used. The results are discussed in Section 5. Section 6 concludes with observations from a broad policy perspective.

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[3] However, the effect of the brain drain could be positive if migration prospects foster investments in education because of higher expected returns abroad (Beine et al., 2001).

2. Financial Crisis and Remittances

The global financial crisis has had a dampening effect on the remittances received by developing countries. ADB (2011) shows that since the onset of the financial crisis, remittance flows to Asian countries have declined, primarily due to rising unemployment. Analysis of household surveys shows that, during the crisis, the number of migrant workers declined by 7 per cent for Bangladesh, 2 per cent for Indonesia and remained unchanged for the Philippines. There was a decline in incomes as a result of the crisis. 97% of households in Bangladesh, 82% in Indonesia, and 64% in the Philippines reported lower incomes. The reasons include, apart from falling remittances, job losses, wage cuts and depreciation of the peso in the Philippines. Savings as well as investments in physical and human capital declined during the crisis. As a coping mechanism, households in Bangladesh and Indonesia worked more, and in the Philippines, borrowed more. Evidence from the Philippines shows that children dropped out from school as a result of the shock.

Although in most cases there was a decline in remittances received by developing nations in 2008-09 (e.g. remittances to Tajikistan decreased by 29 per cent in 2009), they increased in some cases, for instance, due to workers coming back to their home country and bringing back all their savings. This, however, may be just a temporary increase (e.g. Pakistan witnessed a 23 per cent growth in remittances in the first half of 2009). The Philippines received USD 11.34 billion in remittances between January and August 2009, as compared to USD 10.94 billion for the same period in the previous year. In Bangladesh, remittances increased from USD 471 million in August 2007 to USD 935 million in August 2009. The reasons for some countries not experiencing a steep decline in remittances during the crisis include: (i) permanent oversees migrants did not suffer from the financial crisis, (ii) many migrants were settled in developing nations which were not severely affected by the financial crisis, and (iii) migrants were engaged in those jobs or industries which were relatively untouched by the financial crisis (Jha, Sugiyarto, & Vargas-Silva, 2009).

Migrant workers around the world began 2011 by sending home significantly more money than they did in 2010 (IFAD, 2011). While Pakistan showed a 34 per cent increase, Bangladesh reported a two per cent increase. This may be attributed to the rate of recovery in the United States, the largest remitting economy. While short-term migrant labourers tend to be the first to lose their jobs during an economic downturn, they are often the first to be rehired during a recovery, so there is hope for continued improvement in global remittances as the U.S. economy continues to emerge from the crisis. Since the outbreak of the financial crisis, exchange rates were highly volatile. Accordingly, over the course of 2010, while 70 per cent of the countries showed an increase in the dollars remitted, recipients in 60 per cent of the countries experienced an actual decrease in the purchasing power of the money they received. The rise of the dollar against developing country currencies at the outset of the global recession initially had a positive effect for families receiving remittances, effectively delaying the effect of the crisis in those countries with a flexible exchange rate. In 2010, however, that trend began reversing as developing country currencies rebounded, leaving many recipient families to face the same financial pressures that have been experienced by migrant workers in more developed economies (ibid, 2011). The rising trend of remittance flows to Asia has continued in 2010-11 and is expected to continue in 2012-14 (World Bank, 2012). The remittance flows to 'East Asia and Pacific' and 'South Asia' and their estimates have changed from USD316 billion (50.6% in the total remittance inflows to developing countries) in 2009 to USD406 billion (54.9% in total, an estimate) in 2012 and USD434 (55.4%, a forecast) in 2015 (ibid., 2012).

3. Remittances, Growth and Poverty

Remittances impact growth in the following three ways (Barajas, et al. 2009). First, by affecting the rate of capital accumulation, remittances not only increase the rate of accumulation of both physical and human capital, but also lower the cost of capital in the recipient country. Thus, additional borrowing may increase and lead to greater indebtedness. These may also have a role in stabilizing the economy, or reducing volatility, and hence, reducing the risk premium that investors demand. The second effect is related to the resulting change in the labour force growth. Remittance receipts have a negative impact on labour force participation by substituting remittance income for labour income, and by consuming more leisure and doing less work. Third, remittances impact the efficiency of investment by affecting TFP growth, depending on who is making the investment decision (ibid., 2009). If the recipient makes the decision on behalf of the remitter, it is likely that his decision is not as efficient as the one made by a skilled domestic financial intermediary in case of a formal capital inflow. Remittances may result in greater financial development. It can also result in exchange rate changes - inflow of funds can result in currency appreciation (or the Dutch disease) and lower exports.

Barajas et al. (2009) examine the impact of remittances on growth in 84 recipient countries based on annual observations during 1970–2004. They use the following instruments: the ratio of remittances to GDP of all other recipient countries that captures the effects of global reductions in transactions costs and other systematic changes in the microeconomic determinants of remittances. In most cases, remittances have a negative sign and, in others, there is no robust relationship between remittances and economic growth. Chami et al.'s (2005) model shows that remittances are compensatory in nature, rising with the level of altruism, and falling as the recipients' wage in the high output stage rises given a negative relationship between the recipients' income and the level of remittances. This is the opposite of what would happen if remittances functioned as investment flows. The model also implies a negative externality on both the immigrant and the recipient. Given the moral hazard issue - workers slackening with remittances - there is a negative effect on aggregate output. Based on data for 113 countries over a 29-year (1970-98) period, Chami et al. (2005) controlled for lagged income gap and the interest rate gap between the recipient country and US as determinants of remittances and showed that workers' remittances have a negative and significant effect on growth, which is consistent with the moral hazard issue of workers' slackening efforts with higher remittances.

Pradhan et al. (2008) examined the effect of workers' remittances on economic growth using panel data from 1980–2004 for 39 developing countries and confirmed a positive impact on growth. Using the data for more than 100 countries in 1975–2002 and controlling for the endogeneity of remittances and financial development by System GMM, Giuliano and Ruiz-Arranz (2009) investigated the relationship between remittances and growth and the interaction of remittances with the financial development in the recipient country. They found that remittances have promoted growth in less financially developed countries.

There have been relatively few studies that examined the impact of remittances on poverty. A notable exception is Vargas-Silva et al. (2009) who have examined the impact of remittances on poverty and economic growth in Asia using annual data. In their specification, GDP growth rate and poverty gap ratio are expressed as a function of remittances (log of remittances as per cent of GDP), logarithm of initial GDP per capita, primary school completion rate, natural logarithm of gross capital formation, openness of trade, and GDP deflator. While the impact of remittances on growth in positive, the impact on poverty is negative. A 10 per cent increase in remittances as a share of GDP in a given year leads to about a 0.9–1.2 per cent increase in annual growth. A 10 per cent increase in remittances (as a percentage of GDP) decreases the poverty gap by about 0.7–1.4 per cent. On the evidence outside Asia, Taylor (1992) showed, based on household data in Mexico, that the remittances from USA in 1982 helped farmers increase livestock holdings, which subsequently reduced inequality in 1988.

Remittances also help in reducing consumption instability in developing countries. Remittances act both as ex-ante risk avoidance tool as well as ex-post risk management mechanism (e.g. remittances increase after natural disasters affect a region). Combes and Ebeke (2011) use a System-GMM-IV model for a cross-sectional panel of 87 developing countries over the period 1975-2004 to estimate the impact of remittance on consumption instability. They find that remittances significantly reduce consumption instability, the impact being stronger in financially less developed countries. However, the stabilizing impact of remittances decreases at higher levels of remittances. Remittances also increase resilience to shocks, such as natural disasters and macroeconomic shocks.

4. Data and empirical strategy

Data

Our sample is dictated by data availably and consists of 24 Asia and Pacific economies[4] over the period 1980 to 2009.[5] The definition and sources of all the variables are given in the Appendix. Unless stated otherwise, the data are drawn from World Development Indicators 2011 (World

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[4] These are Armenia, Iran, Nepal, Azerbaijan, Kazakhstan, Pakistan, Bangladesh, Korea Rep., Papua New Guinea, Cambodia, Kyrgyz Republic, Philippines, China, Lao PDR, Sri Lanka, Fiji, Malaysia, Thailand, India, Maldives, Tonga, Indonesia, Mongolia and Vanuatu.

[5] As our panel has a relatively small n (individual units) and large t (time), the first difference or system GMM estimators cannot be adequately applied to our sample as these methods were developed for panel data with a large n and a relatively smaller t (e.g. Blundell et al. 2000).

Bank, 2011). Based on the existing literature on remittances and growth, such as Chami et al. (2005), our baseline specification takes the following form:

$$\Delta y_{it} = \gamma LREM_{it} + \beta X_{it} + \eta_i + \varepsilon_{it} \qquad (1)$$

where for country *i* at time (denoting year) *t*, Δy denotes rate of growth of real per capita GDP, $LREM$ is logarithm of workers' remittances expressed as a percentage of GDP. η_i is unobserved country-specific effect and ε_{it} is the idiosyncratic error term. The vector X contains a standard set of determinants of economic growth, such as lag of real per capita GDP[6], financial sector development, inflation, civil war, resource abundance, capital account openness, and investment.

Following the empirical literature of economic growth, we include lagged real per capita GDP to allow for convergence. Here a negative coefficient is expected given the predictions of the standard neoclassical model. In line with Levine et al. (2000), we use deposit money bank assets as a share of deposit money and central bank assets (defined by Beck et. al., 2009) as a measure of financial sector development to account for the fact that the relationship between remittances and growth may work through the financial sector (Guiliano and Ruiz-Arranz, 2009). To capture the macroeconomic and political environments, we account for inflation and civil conflicts measured by internal armed conflicts from UCDP/PRIO Conflict Database (2009)[7]. In addition, we consider the role of resource abundance captured by fuel exports as a percentage of merchandise exports sourced from the Quality of Government dataset (2011)[8]. We also use the capital account openness measure, first introduced by Chinn and Ito (2006), which measures a country's degree of openness based on restrictions on cross-border transactions. Following

6 A 2 year lag has been taken in the present study, but use of a 1 year or longer lag will not change the results significantly.

[7] It is available from http://www.prio.no/CSCW/Datasets/Armed-Conflict/UCDP-PRIO/.

[8] It is available from http://www.nsd.uib.no/macrodataguide/set.html?id=37&sub=1.

Barajas et al. (2009), we check the sensitivity of the remittances-growth nexus to the inclusion of investment as a conditioning variable recognising that it may be one of the most important channels through which remittances influence economic growth.

Model of Remittances and Economic Growth

To explore the effects of remittances on growth, we first use static panel data methods, such as fixed or random effects model. However, as some of the explanatory variables, including remittances, are likely to be endogenous, we also use the panel two-stage least squares (2SLS). Here, lagged per capita GDP, financial development, and investment are instrumented by their own lags since these are orthogonal to the error term. Our main variable of interest – remittances – is also instrumented by its own lag. In line with Chami et al. (2005), we use the income gap between each remittance receiving country and the US as an additional instrument.

Volatility of capital inflows and growth

It is generally accepted that most sources of foreign exchange for poorer countries tend to follow global economic trends, increasing in good times and decreasing in bad times. Here, we empirically test whether the volatility of two types of inflows – namely, FDI and remittances- is harmful, or beneficial to economic growth. To measure volatility, we have used the standard deviation of each variable measured over a non-overlapping 5-year period as we are interested in the steady state link between the volatility of capital inflows and growth.

For this purpose, following Love and Zicchino (2006), we estimate a trivariate panel vector autoregression (PVAR) in the following form:

$$Y_{it} = \beta_0 + \sum_{j=1}^{k} \beta_j Y_{it-j} + \eta_i + \varepsilon_{it} \qquad (2)$$

where for country *i* at time *t*, Y_{it} is a vector of three endogenous variables (i.e., the logarithm of real per capita income and the standard deviations of FDI and remittances), η_i denotes a country-specific fixed effect and ε_{it} is the error term. Since construction the lagged dependent variables are correlated with the unobserved country-level fixed effect, η_i , we use forward mean-differencing which validates the use of lagged right hand side variables as instruments for the endogenous variables via system generalised method of moments (GMM) procedure.

Our interest lies in generating impulse response functions which depict the reaction of one variable in the system to innovations in another variable while keeping all other shocks at zero. To make the variance-covariance matrix of the errors orthogonal, Cholesky decomposition is used where variables that come early in the ordering of the VAR system are assumed to affect the other variables contemporaneously and those that come last in the ordering are assumed to influence those listed earlier only with a lag. In our estimations, we assume that innovations in the volatility of remittances influence the other variables contemporaneously and hence the standard deviation of remittances appears first in the ordering. On the other hand, we assume that the performance of real per capita GDP in resource receiving countries does not influence the volatility of inflows within the same year. Hence, it comes last in the ordering. The matrix of the impulse response functions is based on the estimated VAR estimates and their standard errors and the confidence intervals are produced with Monte Carlo simulations.

5. Empirical results

Remittances and Growth

The baseline results are reported in Table 1. The results in columns [1]-[4] show that the coefficient on lagged GDP carries the expected negative sign and it is significant at the 1% level.

The coefficient estimate shows the elasticity of economic growth with respect to remittances and it ranges from 1.078 (0.805) in case of fixed (random) effects model to 1.702 (1.196) in case of fixed (random) 2SLS model. If we take the estimate of column [1], it implies that a 10% increase of the share of remittances in GDP is on average associated with the 10.78% increase in “the level” of GDP per capita growth rate (where for example 5% of GDP per capita growth will be promoted to 5.54% on average) *ceteris paribus*. Given that remittances have increased rapidly in recent years as discussed in Section 2, the positive effect of remittances should not be underestimated by policymakers despite alleged disincentive effects. The existing literature (for example, Barajas et al. 2009) identifies various channels through which remittances enhance growth, including the boosting of capital accumulation, labor force growth, and total factor productivity, some of which can be controlled by government policies to intervene financial and/or labor markets. It is also conjectured that the government could mitigate any legal or institutional barriers to outmigration or promote financial liberalization policies to ban any restrictions on remittances from abroad. Introducing modernized banking systems or facilities (e.g. setting more branches of international/national banks and ATM in city areas) would also help. The coefficient of financial development is positive and relatively large, but it is not statistically significant. This becomes significant once we drop investment.

[Table 1 to be inserted]

The results show that macroeconomic instability in the form of high inflation is detrimental to economic growth as found in all the columns. This is in line with the conventional wisdom that a stable macroeconomic environment reduces the risks and uncertainties associated with investment projects and thus results in economics growth. Along with the banking policies, the government needs to stabilise inflation by monetary policies or other policies to curb inflation to ensure economic growth. We also find that civil wars are negatively related to growth presumably because of their disruptive effects on economic activity. The coefficient estimate is negative and significant in columns [2] and [4].

The results in columns [2], [3] and [4] indicate that, on average, countries with open capital account regimes register higher rates of growth. This is in line with the new evidence which indicates that financial openness is likely to be associated with higher factor productivity and greater efficiency, and hence better economic performance (Bekaert et al. 2010). The estimated coefficients also suggest that both investment and natural resources are positively related to growth.

It is consistently found across different specifications and estimation methods that remittances are positively associated with better economic performance. The results are important because the coefficient estimate of remittances is positive and significant even after they are adjusted for their endogeneity (in columns [3] and [4]).[9] [10]

The volatility of capital inflows and growth

An attractive feature of the PVAR is that it sidesteps endogeneity concerns by treating all the variables in the system as endogenous. Table 2 summarises the results. As may be seen from it, the volatility of both remittances and FDI is inversely related to economic performance. The coefficient estimates indicate that the negative effects of volatility are little larger with FDI than

[9] Our result is in sharp contrast to Barajas et al. (2009), which finds no relation between remittances and growth, or Chami et al. (2005) claiming that remittances negatively affect growth. The reason why we have obtained different results remains unclear, but it is surmised that focusing only on Asian countries and more recent periods (1980-2009) may have overturned the sign of the coefficient estimate.

[10] We have carried out sensitivity test by considering the effects of an extended set of control variables (namely, property rights, regime durability, FDI, government expenditure and ODA) using panel-2SLS where ‘remittances’ are instrumented by their own lag and the income gap between each country and the US. In all the cases, the positive and statistically significant coefficient estimate of remittances is unchanged. A full set of the results will be furnished on request.

with remittances. It is postulated based on this finding and our previous results that, while remittance flows may alleviate financial constraints and thus stimulate economic development, they may also be a source of output shocks, e.g. arising from the situations where countries are unable to buffer against sudden swings in inflows.[11] Macro policies to stabilize financial inflows at the aggregate level are considered to be important for these countries.

[Table 2 to be inserted around here]

Remittance and Poverty in Asia

In this sub-section, we examine how remittances would affect poverty in Asian countries as an extension of the growth regressions in the previous sections along the lines of Imai et al. (2010). Among various poverty measures including both income and non-income indicators, we use international poverty headcount measures based on US$1.25 or US$2 a day, estimated by the World Bank (Ravallion et al. 2008), as they cover a wide range of countries and years. However, as these poverty data are usually based on household surveys which take place once in few years, the corresponding panel is highly unbalanced. Constrained by limited data, we have used a parsimonious specification in which log of growth rate of GDP per capita is estimated by a smaller number of explanatory variables, that is, (a 2 period) lagged *growth* of agricultural value added per worker, or lagged (level of) agricultural value added per worker, or lagged (level of) GDP per capita as an instrument to capture the long-run effect of agricultural productivity on growth), investment, financial development, remittances, trade in the first stage of Fixed-effects

11 The results based on the impulse response functions for the volatility of remittances and FDI show that an exogenous shock to the volatility of both types of capital inflows contracts economic growth- especially in the short run (i.e. in 2 to 3 years after the shock), where countries may find it harder to adjust to unexpected changes in capital inflows. The results will be supplied on request.

2SLS. In the second stage, the poverty head- count is estimated by the same set of variables except the instrument.

Table 3 gives the FE-2SLS results for poverty. We use lagged agricultural growth per worker as an instrument in Case (a), lagged agricultural value added (in level) per worker in Case (b) and lagged GDP per capita in Case (c). The first two columns of each case show the results for poverty headcount based on US$1.25 and the second two columns on US$2. Both cases yield broadly similar results. The results of the first stage equation for growth rate are largely in line with those in Table 1. There is a striking difference in the effect of agricultural production on growth depending on whether we use the level or growth. In Case (a), we observe a strong and statistically highly significant effect of lagged agricultural growth on economic growth (consistent with a key role of agricultural sector as an engine of economic growth). However, in Case (b), the coefficient estimate of the level of agricultural value added per worker becomes negative and statistically significant. This presumably reflects the convergence effect of agricultural production, that is, a country with *low* initial agricultural production tends to have a higher growth than those with high initial production. If we replace lagged agricultural value added per worker by lagged GDP per capita in Case (c), another and more conventional specification to check for growth convergence, we find a similar pattern of results. The results of other variables are the same as before - investment, financial development, and remittances have positive and significant coefficients. However, trade openness is positive but non-significant.

[Table 3 be inserted]

In the second stage, the share of remittances in GDP is negatively associated with poverty in Cases (b) and (c). It follows that remittances not only promote economic growth, as evidenced by the results in both Tables 1 and 3, but also reduce poverty as shown in Table 3 (on the two criteria of US$1.25 and US$2). The underidentification test suggests that the equations are not underidentified, i.e., the instruments are relevant and correlated with the endogenous variable. However, in Case (a), the coefficient estimate of remittances is negative and not significant in the second stage of poverty equation. Simulation requires significant coefficient estimates and thus we will use Case (b) in Table 3 for poverty simulations.

As both dependent and explanatory variables are in logarithms, the coefficient estimates in Table 3 (Case (b)) are elasticities. Table 4 shows the magnitude of the effects of remittances on poverty. In the case of headcount ratio (US$1.25), the indirect effect of remittances on poverty (0.372) is obtained by multiplying 1.878 (the elasticity of economic growth with respect to remittances) and 0.198 (the elasticity of poverty with respect to economic growth) assuming that other factors are unchanged. With regard to the direct effect, the elasticity of poverty with respect to remittances is -0.500. This is much larger than the indirect effect in absolute terms and the total effect is -0.128. This implies that a 1% increase in the share of remittances in GDP (e.g. 10% to 10.1%) leads to a 0.128% decrease in the headcount ratio (from 10% to 9.987%) *ceteris paribus*. Likewise, in the case of the US$2 poverty, the indirect effect of remittance is obtained as 0.198 and the direct effect is -0.280, leading to the total effect of -0.082 *ceteris paribus*.[12]

[Table 4 be inserted]

We have estimated the change in the poverty headcount ratio for 10 selected countries using these elasticity estimates.[13] Three cases have illustrative value - a 10%, 20%, or 50% increase in the current remittance ratio and their poverty effects. For example, in Bangladesh, a 50% increase of the share of remittances in GDP (from 11.78% to 17.67%) would increase GDP per

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[12] Our results are consistent with Adams (2011) who surveyed 50 studies on the economic impact of international remittances and concluded that remittances generally have a positive impact on poverty and health, while they can have negative effects on economic growth drawing mainly on Chami et al. (2005).
[13] A full set of country-level results will be supplied on request.

capita growth rate from 4.30% to 4.97% and reduce the poverty headcount (on US$1.25 a day) from 49.60% to 46.43% and that on the higher cut-off (US$2.00 a day) from 81.30% to 77.97%. These results imply that remittances reduce poverty significantly, especially extreme poverty.

A few other cases further corroborate these results. In India, a 50% increase in the share of remittances in GDP (3.59% to 5.39%) accelerates economic growth (from 7.65% to 8.84%) and reduces the US$1.25 poverty from 41.6% to 38.94%, and the US$2 poverty from 75.60% to 72.50%. Again, a potential reduction in poverty arising from increased remittances is substantial. Similar results are obtained for Nepal, the Philippines and Sri Lanka. In Nepal, where the remittance share has increased significantly in recent years, a 50% increase in it - a rise in the share from 23.83% to 35.75% - leads to a poverty reduction from 55.10% to 51.57% (US$1.25 a day) and from 77.60% to 74.42% (US$2.00 a day). If Sri Lanka sees a rise in the share of remittance from 8.01% to 12.02% (i.e by 50%), the headcount ratio (on US$2.00) will reduce from 29.1% to 27.91%. These results will, however, have to be interpreted with some caution as the same elasticity estimates are applied to all countries in the sample. However, it would be safe to conclude that increase in remittances not only promotes economic growth but also reduces poverty.

Given the large population in some countries like India, poverty reduction by only 2 or 3 percentages is likely to be important in terms of potential policy impacts. It seems particularly important to find that direct effects of remittances on poverty are dominant. If we interpret these results in policy terms, government should be aware that policies to help poor families and their relatives send money internationally would reduce poverty significantly. However, as the poor tend to have limited access to remittances, government policies directly supporting the poor should be implemented as the same time.

6. Concluding Observations

The present study re-examined the effects of remittances on growth of GDP per capita using annual panel data for 24 Asia and Pacific countries. The results confirm that remittances flows have been beneficial to economic growth. This finding is robust to endogeneity concerns. However, the paper also presents some new evidence that the volatility of remittance and FDI is harmful to economic growth. This means that, while remittances contribute to better economic performance, they are also a source of output shocks. Finally, remittances contribute to poverty reduction - especially through their direct effects. This result is robust to two measures of poverty, estimated using the cut-off points of $1.25 per capita/day and $2 per capita/day.

Migration and remittances are thus potentially a valuable complement to broad-based development efforts. However, we argue that they should not be seen as a panacea for growth and poverty reduction as they have been linked with, among other things, lower work effort, brain drain and Dutch disease. Also, remittances cannot act a substitute for official sources of capital such as aid, as private money cannot be expected to contribute towards public projects. Moreover, not all poor households receive remittances, and public funds are meant to alleviate poverty. Nonetheless, in tandem with both the theoretical and empirical literature, our results suggest that remittances can have a positive effect on growth and poverty reduction. A supplementary conclusion emanating from this study is that policy makers should adopt policies that encourage the use of remittances for physical and human capital investments so as to harness its full potential for economic development. More specifically, as emphasised in Global Forum on Remittances held by IFAD and the World Bank in Bangkok in May 2013[14], remittances could

[14] See http://www.ifad.org/remittances/events/2013/globalforum/ for details.

do more for economic development than official aid and foreign direct investment combined.[15] Specifically, a major concern is how to bring remittances into the formal financial system. Although most of the migrants are not from very poor households with no access to credits, they are still unable to access conventional financial services. Banks avoid lending them as risks of transferring cash remain high, stemming from penalties for abetting money laundering and financing terrorism. So migrants tend to rely on costly money-transfer services or other informal modes of transfer. What is worse, at their destination savings often "end up under the mattress—rather than channeled into microfinance schemes, for instance".[16] This vicious circle between failure to reap full potential of remittances and limited access to formal financial channels needs to be broken. Lower transfer fees are only a part of the solution.

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[15] *The Economist*, May 25th-31st, 2013, p.78.
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TABLE 1 Remittances and growth – baseline models

	FE	RE	FE-2SLS	RE-2SLS
	[1]	[2]	[3]	[4]
Lagged GDP[1]	-4.379 [1.454]***	-2.503 [0.870]***	-8.145 [1.791]***	-3.447 [0.940]***
Inflation[1]	-1.069 [0.517]*	-1.143 [0.496]**	-1.044 [0.322]***	-1.137 [0.310]***
Fin dev / GDP[1]	2.159 [2.355]	2.508 [1.774]	4.243 [2.969]	3.619 [2.157]*
Remittance / GDP[1]	1.078 [0.548]*	0.805 [0.464]*	1.702 [0.475]***	1.196 [0.392]***
Resource abundance	0.084 [0.026]***	0.071 [0.026]***	0.077 [0.034]**	0.087 [0.022]***
Cap acc openness	0.746 [0.469]	0.652 [0.292]**	0.767 [0.411]*	0.760 [0.313]**
Civil war	-0.421 [0.272]	-0.534 [0.285]*	-0.434 [0.324]	-0.629 [0.299]**
Investment / GDP	0.219 [0.078]**	0.204 [0.071]***	0.166 [0.069]**	0.127 [0.061]**
Observations	303	303	298	298
Specification tests[2]				
Hausman test (chi-squared)	3.72			
Overidentification			0.87	
Underidentification			0.00	
F-statistic (weak inst.)			19.82	

TABLE 2 PVAR results: Effects of Volatility of Capital Inflows on Economic Growth

	Income	FDI volatility	Rem volatility
Rem volatility (*t*-1)	-0.027 [2.010]**	0.130 [1.822]	0.002 [0.010]
FDI volatility (*t*-1)	-0.049 [-2.882]**	0.196 [2.194]**	-0.001 [-0.014]
Income (*t*-1)	0.591 [21.872]**	0.027 [0.211]	-0.090 [-0.998]

Notes: the trivariate panel VAR model is generated via GMM.
Robust *t*-statistics are in parentheses and ** indicates significance at the 5% level.

TABLE 3 Remittances, growth and poverty (Fixed Effects 2SLS)

	Case (a)-1		Case (a)-2		Case (b)-1		Case (b)-2		Case (c)-1		Case (c)-2	
	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage
Dep Var	Growth Rate (GDP pc)	Poverty HC (US$1.25)	Growth Rate (GDP pc)	Poverty HC (US$2.00)	Growth Rate (GDP pc)	Poverty HC (US$1.25)	Growth Rate (GDP pc)	Poverty HC (US$2.00)	Growth Rate (GDP pc)	Poverty HC (US$1.25)	Growth Rate (GDP pc)	Poverty HC (US$2.00)
Growth	**-**	**-0.14**	**-**	**- 0.10**	**-**	**0.198**	**-**	**0.11**	**-**	**0.103**	**-**	**0.054**
Rate [1]	**-**	**[0.079]***	**-**	**[0.062]**	**-**	**[0.093]****	**-**	**[0.052]****	**-**	**[0.051]****	**-**	**[0.029]***
Lagged growth of Ag VA per worker[1]	**19.25**	-	**17.71**	-								
	[6.224]***		**[7.015]****									
Lagged Ag VA per worker (level) [1]	**-**	-	**-**	-	**-9.86**	-	**-11.09**	-		-		-
					[2.935]***		**[3.058]*****					
Lagged GDP per capita (level) [1]	**-**	-	**-**	-	**-**	**-**		-	**-8.479**	-	**-9.534**	-
									[1.548]***		**[1.657]*****	
Investment/GDP	0.255	-0.006	0.33	- 0.00	0.309	-0.094	0.361	-0.067	0.312	-0.069	0.364	-0.048
	[0.069]***	[0.026]	[0.074]***	[0.023]	[0.069]***	[0.033]***	[0.072]***	[0.021]***	[0.063]***	[0.022]***	[0.065]***	[0.014]***
Fin dev / GDP[1]	2.891	-0.645	2.49	- 0.11	5.434	-1.64	5.431	-0.648	5.654	-1.361	5.699	-0.504
	[2.350]	[0.619]	[2.649]	[0.442]	[2.440]**	[0.785]**	[2.671]**	[0.495]	[2.170]**	[0.608]**	[2.376]**	[0.394]
Remittance/GDP[1]	**1.169**	**-0.01**	**1.03**	**- 0.01**	**1.878**	**-0.5005**	**1.796**	**-0.2804**	**2.511**	**-0.362**	**2.519**	**-0.207**
	[0.499]**	**[0.166]**	**[0.562]***	**[0.117]**	**[0.502]*****	**[0.205]*****	**[0.549]*****	**[0.120]****	**[0.481]*****	**[0.143]****	**[0.527]*****	**[0.089]****
Trade	0.017	-0.013	0.01	- 0.01	0.031	-0.0174	0.0355	-0.009	0.048	-0.0162	0.0537	-0.008
	[0.026]	[0.006]**	[0.028]	[0.004]	[0.026]	[0.008]**	[0.028]	[0.005]*	[0.023]**	[0.006]**	[0.026]	[0.004]**
Observations	101	101	103.00	103.00	101	101	103	103	101	101	103	103
Specification tests												
Overidentification	0			-	0		0		0		0	
Underidentification	0.0026			0.01	0.0012		0.0005		0		0	
F-statistic (weak identification test)	9.561			6.38	11.298		13.165		30.01		33.111	

Notes: Robust standard errors in brackets. ***, ** and * indicate significance at 1, 5 and 10% levels, respectively. 1 Variables are in log form.

TABLE 4 Magnitude of the effect of remittances on poverty

Case (1) Headcount Ratio based on US1.25						
∂log gdp pc growth / ∂log remittances *	∂log poverty / ∂log gdp pc growth	indirect effect		direct effect		∂log gdp pc growth / ∂log remittances
1.878 *	0.198	0.372	+	(-0.500)	=	-0.128
10.0	% increase in remittance ratio		→	1.3		% reduction of poverty head count ratio ($1.25 a day)
20.0	% increase in remittance ratio		→	2.6		% reduction of poverty head count ratio ($1.25 a day)
50.0	% increase in remittance ratio		→	6.4		% reduction of poverty head count ratio ($1.25 a day)
Case (2) Headcount Ratio based on US$2.00						
∂log gdp pc growth / ∂log remittances *	∂log poverty / ∂log gdp pc growth	indirect effect		direct effect		∂log gdp pc growth / ∂log remittances
1.796 *	0.110	0.198	+	(-0.280)	=	-0.082
10.0	% increase in remittance ratio		→	0.8		% reduction of poverty head count ratio ($2 a day)
20.0	% increase in remittance ratio		→	1.6		% reduction of poverty head count ratio ($2 a day)
50.0	% increase in remittance ratio		→	4.1		% reduction of poverty head count ratio ($2 a day)

APPENDIX List of Variables

Variable	Source
Growth	Real per capita growth (WDI, 2010)
Lagged GDP	Lagged real per capita income (WDI, 2011 April] expressed in log form
Remittance	Workers' remittances and compensation of employees, received (% of GDP) [WDI, 2011 April] expressed in log-form.
Financial development	Captured by deposit money bank assets / (deposit money + central) bank assets [Beck and Demirgüç-Kunt, 2009] expressed in log-form
Investment	Gross capital formation (% of GDP) [WDI, 2011 April] expressed in log-form.
Inflation	Measured by CPI (annual %) [WDI, 2011 April]
Resource abundance	Proxied by fuel exports (% of Merchandise Exports) [Quality of government dataset, 2011 April]
Capital account openness	A measure of a country's degree of capital account openness based on the existence of multiple exchange rates, current account and capital account transaction restrictions [Chinn and Ito, 2008]
Civil war	Internal armed conflicts [UCDP/PRIO Conflict Database, 2009]
Trade	Exports plus imports (% of GDP) [WDI, 2011 April] expressed in log-form
Property rights protection	A measure of property rights protection or institutional quality: measured by 'constraint on the executive' from the Polity IV dataset. A 7-point scale where higher values imply strong property rights (Marshall et al., 2009).
Regime durability	The number of years since the most recent regime change [Quality of Government dataset, 2011)
FDI	Foreign direct investment (% of GDP) [WDI, 2011 April]
Government size	General government final consumption expenditure (% of GDP) [WDI, 2011 April]
Aid	Oversees development aid (% of GNP) [WDI, 2011 April]
Poverty head count	The percentage of the population living on less than $1.25 a day at 2005 international prices (World Bank, 2011).
Agricultural value added per worker	The net output of the agricultural sector (after adding up all outputs and subtracting intermediate inputs) devided by the labour force (World Bank, 2011).