

2017

International Migration, Workers' Remittances and Permanent Income Hypothesis

Sokchea Lim

John Carroll University, slim@jcu.edu

Hem C. Basnet

Methodist University

Follow this and additional works at: http://collected.jcu.edu/fac_bib_2017



Part of the [Finance and Financial Management Commons](#)

Recommended Citation

Lim, Sokchea and Basnet, Hem C., "International Migration, Workers' Remittances and Permanent Income Hypothesis" (2017). *2017 Faculty Bibliography*. 19.

http://collected.jcu.edu/fac_bib_2017/19

This Article is brought to you for free and open access by the Faculty Bibliographies Community Homepage at Carroll Collected. It has been accepted for inclusion in 2017 Faculty Bibliography by an authorized administrator of Carroll Collected. For more information, please contact connell@jcu.edu.

International Migration, Workers' Remittances and Permanent Income Hypothesis

SOKCHEA LIM^a and HEM C. BASNET^{b,*}

^a *John Carroll University, USA*

^b *Methodist University, USA*

Summary. — Studies that examine the long-run impact of remittances on economic growth in West Africa and the Caribbean show that remittances are not growth enhancing. Money has been used toward consumption rather than investment. Because migrants from these regions are mostly permanent immigrants who settle in the host countries, we ask if there is a difference for South Asia where migrant workers are flooding for short-term, temporary contracts in the Middle Eastern countries. The permanent income hypothesis states that a permanent increase in income raises current consumption while transitory income increase is saved or smoothed over a life time. We argue that the transitory income remitted by short-term migrants is invested to generate future income when they return. We examine a panel data of five South Asian countries—Bangladesh, India, Nepal, Pakistan, and Sri-Lanka—for a period from 1975 to 2011. Using panel cointegration and Pooled Mean Group (PMG) estimation of dynamic heterogeneous panels, we show that there is a long-run significant impact of workers' remittances on income while the impact on consumption is not significant. A one-percent increase in remittance receipt per person raises per-capita income by approximately 0.23%. The results are robust across different tests.

Key words — remittances, South Asia, economic growth, panel cointegration, Pooled Mean Group estimation of heterogeneous panels, permanent income hypothesis

1. INTRODUCTION

Remittance flows to developing countries were estimated at \$436 billion in 2014, approximately 75% of global remittances and it represented an increase of 4.4% over a year ago (World Bank, 2015). According to the World Bank's Brief on Migration and Remittances, South–South remittances accounted for 34% of global remittances, a little less than North–South remittances at 38%. At the same time, South–South migration accounted for about 37% of the global migrant stock, a little larger than South–North migration at 35%. The fact that the flows of remittances and migrant workers among these regions are largely comparable is staggering.

Two important questions are extensively examined in the literature. The first question asks why migrants are sending money back home. In general, previous studies attempt to show whether migrants exhibit altruistic or self-interest behaviors. Altruistic migrants would remit more money as their family encounters economic difficulty at home while self-interest migrants would send more money to invest in lucrative assets or businesses during economic boom. The evidence is mixed. Studies that use household data have shown that remittances can be motivated by altruistic behavior, insurance purposes, loan repayment, and investment (see Agarwal & Horowitz, 2002; Lucas & Stark, 1985; Rapoport & Docquier, 2006, chap. 17; Yang, 2011). Using country-level data, some studies have shown that remittances and income are countercyclical (Frankel, 2011; International Monetary Fund, 2005; Singh, Haacker, Lee, & Le Goff, 2010) while others found that they are procyclical (Lueth & Ruiz-Arranz, 2008). Besides, Lim and Morshed (2015) show that the increased remittances do not come from existing migrants who squeeze their earnings to send more remittances during economic bad times at home, but they come from increased migration as a result of income shocks. They argue that there could be a self-enforced contract to send a fraction of their

money earned abroad to the family members that are left behind.

The second question that is also extensively studied is the economic impact of remittances. The evidence is also mixed. Some find a positive relationship between remittances and economic growth (Faini, 2007; Ramirez & Sharma, 2008; Ziesemer, 2006) while others find a negative or no relationship (Barajas, Chami, Fullenkamp, Gapen, & Montiel, 2009; Basnet & Upadhyaya, 2014; Chami, Fullenkamp, & Jahjah, 2005; Gupta, 2005; IMF, 2005). While many studies have examined this relationship using a panel of developing countries, a few studies have looked at the link in various regions. Nsiah and Fayissa (2013) show a positive, long-run impact of remittances on growth in Africa, Asia, and Latin American and Caribbean countries. Using a similar technique, Ramirez and Sharma (2008) also find the same relationship in Latin American and Caribbean countries while Lim and Simmons (2015) examine only the sample of Caribbean countries and find no long-run relationship between remittances and income. Similar to the latter, Donou-Adonsou and Lim (2016) confirm no long-run relationship for West African countries and argue that the money was used for consumption purposes.

In the wake of these inconclusive findings in the literature, a better understanding of the first question will provide a better answer to the second question. That is the purpose of this paper by first examining the evolution and nature of migration in South Asian countries including Bangladesh, India, Nepal,

*Sokchea Lim is grateful for the financial support of John Carroll University's Wasmer Summer Grants and would like to dedicate the paper to his mother, Neang Chou. The authors are also grateful to three anonymous reviewers and participants at 2015 Midwest Economics Association meeting for comments and suggestions. Usual disclaimer applies. Final revision accepted: March 23, 2017.

Pakistan, and Sri Lanka. We choose these five countries because of the very interesting nature of migration and remittances in this region. The main and common source of remittances for the five countries is the Middle Eastern countries which accounted for more than 55% of total inflows into the South Asian region in 2015. Migrant workers are mainly low-income individuals who are given *short-term* work in those Middle Eastern countries. According to the permanent income hypothesis, a permanent increase in income raises the current consumption while transitory income increase is saved or smoothed over the life time (Friedman, 1957). So, in this paper we argue that when immigrants who permanently settled in host countries send money back to left-behind family members, the money is mostly used for consumption, but when migrant workers who migrate for temporary work abroad send money back home, the money is saved and channeled into productivity-improving investment to generate future income when the migrants return.¹

Pooling the data of five South Asian countries for a period during 1975–2011, the results from the panel cointegration test and dynamic heterogeneous panel estimation show that remittances have a long-run positive impact on income. A one-percent increase in remittance receipt per person raises income by approximately 0.23%. The results confirm that remittance receipt from short-term migrants is invested to generate future income.

The paper contributes to the literature in a number of ways. The findings will cast more light onto the motivations and growth impact of remittances in relation to the nature of migration. The study also provides important implications for immigration policy and policy of the developing countries whose efforts have been put into opening more jobs for their people overseas while domestic economies are slow to generate jobs.

The rest of the paper is organized as follows: Section 2 presents the nature of migration and remittances in the five South Asian countries. Section 3 outlines the estimation methodology and data which is followed by the discussion of the results in Section 4. Section 5 presents the robustness checks and Section 6 concludes.

2. MIGRATION AND REMITTANCES IN SOUTH ASIA

According to World Bank (2015), South Asia and East Asia & Pacific were the top receivers of remittance inflows. Each received approximately 25% of total remittance inflows into developing countries. In 2012, South Asia topped the list, receiving \$108 billion out of total remittances of \$403 billion in developing countries. However, in 2013 East Asia & Pacific topped the list receiving \$113 billion slightly more than South Asia which received \$111 billion. Latin America & Caribbean received \$61 billion, followed by Europe & Central Asia and Middle East & North Africa which received \$52 billion and \$49 billion, respectively. Sub-Saharan Africa was the least recipient, receiving only \$32 billion.

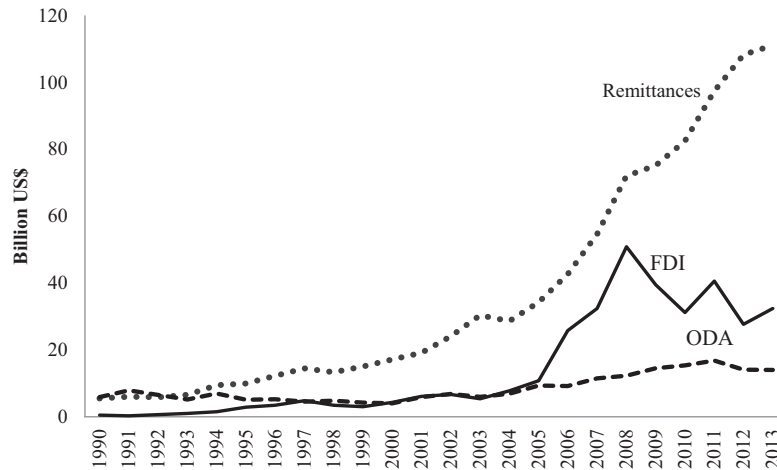
Substantial remittances have flown into South Asia for the last two decades. They were estimated to rise by 4.5% in 2014 and the growth was driven by significant flows into Bangladesh, Pakistan, and Sri Lanka (World Bank, 2015). India is the highest remittance-receiving country, while Pakistan ranked seventh among the top 10 remittance recipients followed by Bangladesh. In terms of remittances as a share of GDP, Nepal is the third top receiver, receiving 29% of its GDP in 2013, after Tajikistan and Kyrgyz Republic. Though not on the top 10 list, migrants' remittances into Sri Lanka are

also significant and on the rise every year. They accounted for about 10% share of GDP in 2013. The rise in per-capita remittance receipt should not be overlooked, either. Per-capita receipt of remittances in Bangladesh rose from around \$20 in the early 1990s to \$70 in 2013 and that in India rose from around \$10 to more than \$40 for the same period while that in Pakistan remained at \$60 for the past decade. Nepal and Sri Lanka had the largest per-capita receipt among the five countries. An average Nepali received more than \$150 in 2013, a drastic rise from just \$8 in 1993 while an average Sri Lankan received \$255 in 2013 from \$160 in 1990.

Remittance inflows into this region have well exceeded official development assistance (ODA) since the early 1990s and surpassed foreign direct investment (FDI) from the mid 1990s. Figure 1 plots three sources of external financial inflows – remittances, ODA, and FDI. It is also widely known that the official figure of remittances underestimates the actual inflows of remittances as informal channels are almost as active as formal channels in remitting money. So, the money sent through informal channels such as couriers or hawala services goes unreported. According to Puri and Ritzema (1999), the share of unrecorded remittances for many remittance-receiving countries ranged from 8 to 40%. In the last decade, the data source system has improved due to reduced cost of sending money through formal channels and increased scrutiny of money laundering (Ratha, 2007) and countries have used a direct measurement through transactions reporting or surveys and estimation methods to try to enhance the quality (World Bank's WDI, 2016).

Looking at the sources of these remittance monies, each of these five South Asian countries received a significantly larger share of remittances from the Middle East. Table 1 displays estimates of bilateral remittance flows from the Middle East. Nepal received 71% of its total remittances from the Middle East in 2015, followed by Pakistan which received 61%. Major host countries for Nepali migrants were Qatar and Saudi Arabia, each sending about \$2 billion. Pakistani migrants in Saudi Arabia and United Arab Emirates sent the most back home, each at about \$5 billion. Bangladesh received roughly 55% and India and Sri Lanka each received about 52%.² Like Pakistan, these countries also received their largest remittances from Saudi Arabia and United Arab Emirates. In total, India received \$36 billion from the Middle East, making it the top recipient among the five countries, followed by Pakistan at \$11.8 billion and Bangladesh at \$8.4 billion. Nepal and Sri Lanka received approximately \$5 billion and \$3.6 billion, respectively.

What is more interesting about this region is the patterns of migration in the five countries. Figure 2 shows migration patterns within the region, to the Middle Eastern countries, and to the US and UK combined. In the early years of the 1960s, there were close to 18 million migrants moving around within the five countries in the region while migrant stock outside these countries accounted for only about 1 million. Migrant stock within the region has since fallen significantly and fast. Then, it stayed stable around 8 million in recent years. This was more than half reduction in migrant stock in 5 decades. The explosion of oil prices in the 1970s and 1980s and the expansion of economic interaction between countries, especially with the Middle Eastern countries, have drastically changed the patterns of international migration and regional migration in particular. Choucri and Brecke (1983) described Asian migration to the Middle East as the third phase of migration process in the region where the presence of Indians, Pakistanis, and Bangladeshis became important. Indian and Pakistani migrants accounted for about 18% of total migrants



Source: World Development Indicators, World Bank

Figure 1. Financial flows to the five South Asian countries.

Table 1. Bilateral remittance estimates for 2015

		Remittance-receiving countries				
		Bangladesh	India	Nepal	Pakistan	Sri Lanka
		<i>In Millions of US\$</i>				
Migrants' host countries	Bahrain	222	1,254	2	264	37
	Kuwait	880	4,566	268	981	124
	Oman	322	3,036	0	348	53
	Qatar	525	3,986	2,021	427	511
	Saudi Arabia	3,775	10,509	1,853	5,007	2,214
	United Arab Emirates	2,700	12,573	803	4,761	627
		<i>In Millions of US\$</i>				
Total inflows from the Middle East		8,423	35,924	4,947	11,788	3,566
Total remittances		15,359	68,910	6,976	19,255	6,999
		<i>In percent</i>				
Share from the Middle East		55	52	71	61	51

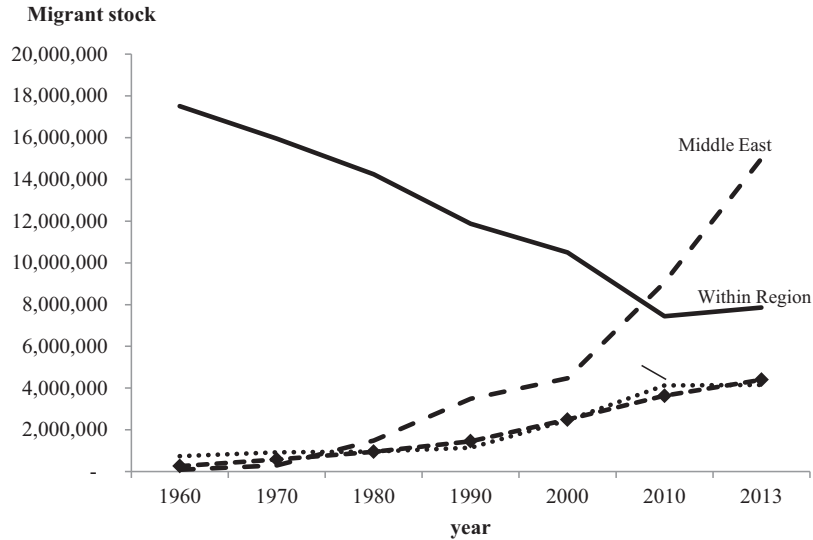
Source: World Bank's Bilateral Migration and Remittance Database (accessed 10/06/2016).

in the Gulf states by 1975 and expanded rapidly. This was driven by huge demand for labor that outstripped the supply from the Arab states and this demand consisted of both unskilled and skilled workers. By 1980 South Asian migrant stock in the Middle East has surpassed their presence in the US and UK combined. By 2010, it has surpassed migration within its own region. The rapid surge of emigrants in the 1980s led to an establishment of governance of migrant workers. For example, India enacted the Emigration Act in 1983; Nepal approved the Foreign Employment Act in 1985; Sri Lanka established the Sri Lanka Bureau of Foreign Employment under the legislation approved in 1985.

There is one important characteristics of migration from these South Asian countries to the Middle East. It is a temporary migration of labor based on fixed term contracts (Khadria, 2008; Wickramasekara, 2011). The movement of labor across these borders is done with proper procedures through formal bilateral agreements between sending and receiving countries or the memorandum of understanding; and the recruitments of migrant workers are done on a commercial basis. Private recruitment firms post job ads, interview candidates, provide training if necessary, take care of visa application, and send migrant workers to the employers.³

According to the estimates by Doherty *et al.* (2014), Nepal has the highest return rate. The average annual return migration of Nepali migrant workers during 2001–10 was about 98%, followed by Sri Lankan migrants at 88%. The estimated return rate in Bangladesh and India during the same period is 49% and 39%, respectively.⁴ These figures are by any measure considered very high.⁵

According to Friedman (1957), the permanent income hypothesis states that current consumption depends primarily on permanent income. Putting in our context, if a family member who permanently immigrates to another country remits a constant amount of money on a regular basis, the consumption of the left-behind family members will rise by about the same amount. This is more likely to be the case. Lim and Morshed (2015) examine remittance and migration flows in developing countries and argue that there could be a self-enforced contract between migrants and family members that migrant workers send a fixed portion of their income earned abroad. They show that existing migrants do not send more money when there is an income shock at home. Therefore, the kind of remittances sent by permanent immigrants is completely channeled into consumption. This argument is consistent with Lim and Simmons's (2015) finding that remittance



Source: Global Bilateral Migration Database, World Bank

Note: Migration to the Middle Eastern countries includes Saudi Arabia, Kuwait, United Arab Emirates, Bahrain, Jordan, Oman, and Qatar.

Figure 2. Migration patterns in the five South Asian countries.

flows into the Caribbean region are mainly used for consumption rather than productivity-improving spending such as investment because those who migrated to the U.S. became permanent residents and eventually U.S. citizens; thus, there is a constant flow of remitted money back home. Donou-Adonsou and Lim (2016) also find a similar result for the West African region where most emigrants settle in Europe. The permanent income hypothesis also predicts that a transitory increase in income is not consumed all at once; it is smoothed over the rest of the life span. This could be consistent with the behavior of South Asian migrants in the Middle Eastern countries. Since their migrant jobs are short term, a portion of the income is saved and potentially invested to generate future income. Thus, we may expect remittances from short-term migrants are growth enhancing.

3. METHODOLOGY AND DATA

Because the results from this study are strictly compared with those of Lim and Simmons (2015) and Donou-Adonsou and Lim (2016), we must employ a similar methodology, variables, and data sources. Donou-Adonsou and Lim (2016) use Westerlund (2007) for the cointegration test while Lim and Simmons (2015) use both Westerlund (2007) and Pedroni (2004) and find that both tests produce similar results. Both studies also provide the results of the error correction equations and Donou-Adonsou and Lim (2016) run PMG estimations in the robustness check. In this study, we use the same main variables from similar sources; we use Pedroni (2004) for the cointegration test and provide results from error correction equations and PMG estimations in a robustness check.

(a) Methodology

To examine the impact of remittances on economic growth, we analyze two relationships. First, we examine the long-run relationship between remittances and income and then between remittances and consumption. We hypothesize that remittances are growth enhancing if the money is used for

investing in small- or medium-sized businesses that accumulate physical capital. However, if the recipient family members use the money for consumption, the growth impact is not evident. The relationship is written as,

$$Y_{it} = \beta_{0i} + \beta_1 t + \beta_2 R_{it} + \varepsilon_{it} \quad (1)$$

where $t = 1, 2, \dots, T$ and $i = 1, 2, \dots, N$ denote the time series and cross-sectional units, respectively. The economic outcome (Y_{it}) is real GDP per capita (RGDPPC) or real consumption per capita (RCPC). R_{it} is personal remittance receipt per person. These variables are in log forms.

To examine the long-run relations among these variables, we employ Pedroni's (2004) panel cointegration tests to test the long-run relationship in the above equation. The tests are based on residual dynamics. The null hypothesis is that the variables are not cointegrated. Pedroni (2004) develops seven statistics. Four statistics are used for panel tests which are designed to test the alternative hypothesis that the whole panel is jointly cointegrated. The other three statistics are used for group-mean tests which are designed to test the alternative that at least one cross-sectional unit is cointegrated. One may expect the endogeneity problem resulting from reverse causality. For example, under altruistic motivation a fall in income will stimulate greater remittances, while under self-interest motivation a rise in income will stimulate greater remittances. The advantage of cointegration method is that it addresses the endogeneity of all variables included in the relationship. When the variables are cointegrated, there exists a comovement among the variables; thus, they have a long-run relationship.

When the long-run relationship is established, we apply the Fully Modified Ordinary Least Squares Method (FMOLS) to obtain the estimate for the impact of remittances on per-capita income and consumption. We constrain both the long-run and short-run coefficients to be equation is specified as follows,

$$\Delta Y_{it} = \mu_{0i} + \mu_1 t + \mu_2 Y_{it-1} + \mu_3 R_{it-1} + \sum_{j=1}^{p_i} \alpha_{0j} \Delta Y_{it-j} + \sum_{j=-q_i}^{p_i} \alpha_{1j} \Delta R_{it-j} + e_{it} \quad (2)$$

Table 2. *Data description and sources*

Variable	Description	Source	Notes
Real per-capita GDP (RGDPPC)	Log of real GDP per capita (Chained PPP), at 2005 constant prices	Penn World Table 8.0 (accessed 02/22/2015)	
Real per-capita consumption (RCPC)	Log of real consumption per capita (Chained PPP), at 2005 constant prices	Penn World Table 8.0 (accessed 02/22/2015)	Consumption share multiplied by PPP converted GDP per capita at 2005 prices
Real per-capita investment (RINVTCP)	Log of real investment per capita (Chain Series), at 2005 constant prices	Penn World Table 8.0 (accessed 02/22/2015)	Investment share multiplied by PPP converted GDP per capita at 2005 prices
Real remittances per capita (R)	Log of personal remittances per capita	WDI online (accessed 02/22/2015)	Remittance data deflated by PPP price level of GDP and divided by population.
Trade openness (TRADE)	Trade to GDP ratio	WDI online (accessed 02/22/2015)	
Financial development (CREDIT)	Domestic credit as a percentage of GDP	WDI online (accessed 02/22/2015)	

Table 3. *Summary statistics*

Variable	Obs.	Mean	S.D.	Min	Max
RGDPPC	185	1,779	844	726	4,822
RCPC	185	1,186	521	522	3,507
RINVTCP	185	334	232	58	1,228
R	165	93	83	2	411
TRADE	185	36	19	11	89
CREDITGDP	185	23	10	2	59

Notes: Variables are expressed in values without taking the log.

Table 4. *Unit root test (H_0 : Unit root)*

Method	Test	RGDPPC	<i>p</i> -val.	RCPC	<i>p</i> -val.	RINVTCP	<i>p</i> -val.	R	<i>p</i> -val.	TRADE	<i>p</i> -val.	CREDIT	<i>p</i> -val.
<i>Tests at the level</i>													
Breitung (2000)	<i>t</i> -stat	-1.264	0.103	3.515	0.999	0.939	0.826	0.160	0.564	2.955	0.998	3.215	0.999
Im et al. (2003)	W_t	2.829	0.998	3.952	1.000	2.564	0.995	-0.053	0.479	2.448	0.993	3.101	0.999
Fisher-ADF	<i>P</i>	2.013	0.996	2.568	0.990	1.480	0.999	25.92	0.004	8.514	0.579	4.441	0.925
	<i>Z</i>	2.713	0.997	2.757	0.997	3.154	0.999	-0.078	0.469	1.573	0.942	2.413	0.992
	L^*	2.743	0.995	2.946	0.997	3.282	0.999	-1.150	0.130	1.952	0.970	2.638	0.993
	P_m	-1.786	0.963	-1.662	0.952	-1.905	0.972	3.560	0.000	-0.332	0.630	-1.243	0.893
<i>Tests at first difference</i>													
Breitung (2000)	<i>t</i> -stat	-2.957	0.002	-1.927	0.027	-7.778	0.000	-2.067	0.019	-3.189	0.001	-4.631	0.000
Im et al. (2003)	W_t	-4.418	0.000	-2.312	0.010	-13.32	0.000	-7.437	0.000	-8.630	0.000	-5.600	0.000
Fisher-ADF	<i>P</i>	19.64	0.033	28.76	0.001	42.93	0.000	36.71	0.000	47.77	0.000	42.22	0.000
	<i>Z</i>	-2.214	0.013	-2.959	0.002	-4.711	0.000	-3.996	0.000	-5.110	0.000	-4.366	0.000
	L^*	-2.148	0.020	-3.290	0.001	-5.310	0.000	-4.482	0.000	-5.953	0.000	-5.130	0.000
	P_m	2.156	0.016	4.195	0.000	7.364	0.000	5.972	0.000	8.446	0.000	7.205	0.000

Notes: Individual effects are included. Trend is included for Breitung (2000). Lag length is chosen using AIC while lags of 2 are chosen for Fisher-ADF.

where p_i and q_i are, respectively, the maximum values for lags and leads of the difference variables across cross-sectional unit i . t is the time trend and μ_{0i} is the cross-sectional fixed effects. The parameter μ_2 determines the speed at which the system corrects back to the equilibrium relationship $Y_{it-1} - \beta_2 R_{it-1}$ after a sudden shock. $\mu_2 < 0$ implies that Y_{it} and R_{it} are cointegrated and if $\mu_2 = 0$, then there is no cointegration. Δ represents the difference in variables and thus α_{1j} represents the short-run effects of remittances on the dependent variable.

As a robustness check, we employ Pesaran, Shin, and Smith's (1999) Pooled Mean Group (PMG) estimation of dynamic heterogeneous panels. Different from Arellano and

Bond's (1991) generalized method-of-moments (GMM) estimations, the PMG estimation technique allows short-run coefficients and error variances to differ across cross-sectional units.⁶ Also, the technique produces long-run coefficients consistent with the objective of the paper. We constrain the long-run coefficients to be identical. The PMG technique employs a maximum likelihood method to estimate the parameters. The autoregressive distributed (ARDL) lag dynamic panel equation is specified as:

$$Y_{it} = \pi_{10i}R_{it} + \pi_{11i}R_{it-1} + \rho_{1i} + \rho_{2i}t + \omega_i Y_{it-1} + u_{it} \quad (3)$$

and the error correction equation is written as:

Table 5. Pedroni's cointegration test (H_0 : No cointegration)

		A. Per-capita income equation		B. Per-capita consumption equation	
		Value	p-Value	Value	p-Value
		No control		No control	
Panel tests	<i>v</i> -statistic	1.369	0.085*	2.595	0.005***
	<i>rho</i> -statistic	-0.239	0.405	-0.586	0.279
	<i>PP</i> -statistic	-0.668	0.252	-0.907	0.182
	<i>ADF</i> -statistic	-1.666	0.048**	-1.372	0.085*
Group tests	<i>rho</i> -statistic	1.316	0.906	0.834	0.798
	<i>PP</i> -statistic	0.824	0.795	0.025	0.510
	<i>ADF</i> -statistic	-2.178	0.015**	-1.810	0.035**
		Control for RINVTPC		Control for RGDPPC	
Panel tests	<i>v</i> -statistic	2.050	0.020**	0.157	0.438
	<i>rho</i> -statistic	0.396	0.654	0.035	0.514
	<i>PP</i> -statistic	-0.480	0.316	-0.718	0.237
	<i>ADF</i> -statistic	-2.082	0.019**	-1.030	0.151
Group tests	<i>rho</i> -statistic	0.971	0.8343	-0.345	0.365
	<i>PP</i> -statistic	-0.768	0.2212	-2.602	0.005***
	<i>ADF</i> -statistic	-2.166	0.0152**	-2.579	0.005***
		Control for RINVTPC and CREDIT		Control for RGDPPC and CREDIT	
Panel tests	<i>v</i> -statistic	1.660	0.048**	0.046	0.482
	<i>rho</i> -statistic	1.009	0.844	-0.058	0.770
	<i>PP</i> -statistic	0.135	0.554	-0.001	0.500
	<i>ADF</i> -statistic	-1.074	0.142	-1.180	0.119
Group tests	<i>rho</i> -statistic	1.616	0.947	0.521	0.999
	<i>PP</i> -statistic	0.015	0.506	-1.476	0.070*
	<i>ADF</i> -statistic	-1.752	0.040**	-2.275	0.012**
		Control for RINVTPC, CREDIT and TRADE		Control for RGDPPC, CREDIT and TRADE	
Panel tests	<i>v</i> -statistic	0.855	0.196	-0.448	0.673
	<i>rho</i> -statistic	1.056	0.934	1.423	0.923
	<i>PP</i> -statistic	0.555	0.710	0.695	0.756
	<i>ADF</i> -statistic	-0.503	0.308	0.493	0.689
Group tests	<i>rho</i> -statistic	1.976	0.976	1.497	0.933
	<i>PP</i> -statistic	0.037	0.515	-0.866	0.193
	<i>ADF</i> -statistic	-1.412	0.079*	-1.060	0.145

Notes: All tests are implemented with a constant and trend in the test regression. For the semiparametric estimation of long-run variances, the width of the Bartlett kernel window is set automatically according to Newey-West. The lag length is chosen according to AIC. *, ** and *** denote the rejection of null hypothesis of no cointegration at the 90%, 95%, and 99% confidence interval, respectively.

$$\Delta Y_{it} = \theta_i(Y_{it-1} - \varphi_{0i}R_{it} - \varphi_{1i} - \varphi_{2i}t) - \pi_{11i}\Delta R_{it} + u_{it} \quad (4)$$

where $\theta_i = -(1 - \omega_i)$, $\varphi_{0i} = \frac{\pi_{10i} + \pi_{11i}}{1 - \omega_i}$, $\varphi_{1i} = \frac{\rho_{1i}}{1 - \omega_i}$, $\varphi_{2i} = \frac{\rho_{2i}}{1 - \omega_i}$

The parameter θ_i determines the speed of adjustment. $\theta_i < 0$ implies that Y_{it} and R_{it} are cointegrated and if $\theta_i = 0$, then there is no cointegration.

(b) Data

Our dataset consists of five South Asian countries that include Bangladesh, India, Nepal, Pakistan, and Sri-Lanka, for a period from 1975 to 2011. Real GDP per capita, real investment per capita and real consumption per capita are obtained from World Penn Table 8.0 (Feenstra, Inklaar, & Timmer, 2013). We also include some control variables jointly or alternatively. Financial market development is measured by domestic credit as a percentage of GDP. Trade openness is measured by trade to GDP ratio. We employ personal remittances, which are downloaded from World Development Indicators (WDI) online. We use the recent estimate of personal

remittances which are defined in the sixth edition of the IMF's Balance of Payments Manual as the sum of *personal transfers* and *compensation of employees*.⁷ Table 2 provides details of variable description and the sources and Table 3 shows the summary statistics of the data.

4. RESULTS

First, we need to test whether the variables used in the analysis are stationary or not. We employ three unit root tests, Breitung (2000), Im, Pesaran, and Shin (2003), and Fisher-type ADF which differ in their assumption of the autoregressive parameter. Breitung (2000) assumes a common autoregressive parameter across cross-sectional units while Im et al. (2003) and Fisher-type ADF allow the parameter to vary freely across the units. While the last two tests are similar, Fisher-type ADF produces statistics from four methods: inverse chi-squared (P), inverse normal (Z), inverse logit

Table 6. Pedroni's cointegration test: Investment per capita (H_0 : No cointegration)

		Per-capita investment equation			
		Value	p-Value	Value	p-Value
		No control		Control for RGDPPC and TRADE	
Panel tests	<i>v</i> -statistic	1.320	0.093*	2.141	0.016**
	<i>rho</i> -statistic	-1.227	0.110	-2.169	0.015**
	<i>PP</i> -statistic	-1.554	0.060*	-4.498	0.000***
	<i>ADF</i> -statistic	-0.909	0.181	-5.280	0.000***
Group tests	<i>rho</i> -statistic	-0.226	0.411	-1.008	0.157
	<i>PP</i> -statistic	-0.997	0.159	-5.708	0.000***
	<i>ADF</i> -statistic	-1.341	0.090*	-6.260	0.000***
		Control for RGDPPC		Control for RGDPPC, TRADE and CREDIT	
Panel tests	<i>v</i> -statistic	1.736	0.041**	0.551	0.291
	<i>rho</i> -statistic	-1.479	0.070*	-1.088	0.138
	<i>PP</i> -statistic	-2.535	0.006***	-3.969	0.000***
	<i>ADF</i> -statistic	-1.918	0.028**	-3.980	0.000***
Group tests	<i>rho</i> -statistic	-0.381	0.351	0.126	0.550
	<i>PP</i> -statistic	-6.440	0.000***	-6.729	0.000***
	<i>ADF</i> -statistic	-2.682	0.004***	-3.612	0.000***

Notes: All tests are implemented with a constant and trend in the test regression. For the semiparametric estimation of long-run variances, the width of the Bartlett kernel window is set automatically according to Newey-West. The lag length is chosen according to AIC. *, ** and *** denote the rejection of null hypothesis of no cointegration at the 90%, 95%, and 99% confidence interval, respectively.

transformation (L^*), and modified inverse chi-squared (P_m). Choi (2001) suggests that the inverse normal (Z) offers the best trade-off between size and power. The null hypothesis for the three tests is the series has a unit root against different alternative depending on the test assumption of the common autoregressive parameter. Trend is included for Breitung (2000). Lag length is chosen using Akaike Information Criterion (AIC) while the lags of 2 are chosen for Fisher-ADF. The results of the unit root tests at the level and first difference are presented in Table 4. Overall, the null of a unit root cannot be rejected at the level and is rejected at the first difference. Thus, the variables used in the study are non-stationary at the level and are stationary at the first difference.

The next step in the analysis is to test the long-run relationship between remittances and economic outcome. We employ Pedroni's (2004) panel cointegration tests. We test the null hypothesis of no cointegration. The results are presented in Table 5. The results include both bivariate relationship and specifications with control variables that are consistent with theories and literature.

First, we test the long-run relationship between per-capita GDP and remittances (Per-capita income equation). The results are reported in panel A. We initially test the relationship without any control variables. Three of the seven statistics reject the null hypothesis that the two variables are not cointegrated. Two statistics, *v*-statistic and *ADF*-statistics, indicate that the two variables in the panel are cointegrated. The other *ADF*-statistic also indicates that there is a long-run relationship in at least one of the cross-sectional units.

To address the concerns that we may not have controlled over other factors that also influence income, a simple classical growth equation that relates income per capita with capital per capita is tested. Similar to Ramirez and Sharma (2008) and Lim and Simmons (2015), investment is used as a proxy for capital per capita. The result is still consistent with the same two statistics in the panel tests and one statistic in the group tests showing statistical significance. We also add other con-

trols such as financial development (CREDIT) and trade openness (TRADE).⁸ The results seem consistent, but only one of the statistics from either of the tests indicates statistical significance when CREDIT is included and only one group test statistic shows statistical significance when both CREDIT and TRADE are included.

Then, the relationship between consumption and remittances (Per-capita consumption equation) is tested. The results are presented in panel B. The results from the bivariate equation without any control variables show that two panel and one group statistics reject the null of no cointegration. Then, we add the income variable (RGDPPC) to make the equation closer to the traditional consumption model. The result shows that the panel test statistics cannot reject the null of no cointegration and two of the group test statistics indicate statistical significance at the 99% confidence interval. The result remains unchanged even when we include financial development (CREDIT). However, when trade openness (TRADE) is added, all tests fail to reject the null of no cointegration.

The cointegration results for the income and consumption equations show that the tests are not consistent as we add more control variables into the equations. Fewer statistics reject the null of no cointegration as trade openness or financial development is added. To further confirm the evidence for the income equation, a relationship between investment and remittances (per-capita investment equation) is examined. The results of the cointegration tests are provided in Table 6. Initially, a bivariate relationship between per-capita investment and remittances is tested. The result also shows that we reject the null of no cointegration in two of the panel tests and one of the group tests. To ensure that the evidence is also robust across specifications that control for factors influencing investment decisions and process, the investment equation also includes current income (RGDPPC), trade openness (TRADE), and financial development (CREDIT). More statistics show statistical significance in both tests, indicating that remittance receipts have been used to boost investment

Table 7. *Per-capita income equation*

Independent variables	Dependent variable: Δ RGDPPC			
	No control (1)	Control for RINVTPC (2)	Control for RINVTPC and CREDIT (3)	Control for RIVTPC, CREDIT and TRADE (4)
RGDPPC (-1)	-0.062*** (0.005)	-0.067*** (0.005)	-0.089*** (0.001)	-0.081*** (0.008)
R (-1)	0.020*** (0.001)	0.012** (0.046)	0.019*** (0.009)	0.019** (0.012)
RINVTPC (-1)		0.017(0.380)	0.050*(0.058)	0.054*(0.055)
CREDIT (-1)			-0.002* (0.073)	-0.002 (0.157)
TRADE (-1)				-0.001 (0.507)
Δ RGDPPC (-1)	0.358*** (0.000)	0.333*** (0.000)	0.330*** (0.000)	0.336*** (0.001)
Δ RGDPPC (-2)	0.155* (0.059)	0.196** (0.021)	0.178** (0.041)	0.187** (0.041)
Δ R (2)	0.037** (0.010)	0.189 (0.188)	0.018 (0.214)	0.020 (0.194)
Δ R (1)	-0.003 (0.821)	-0.002 (0.860)	0.001 (0.934)	0.001 (0.971)
Δ R	0.009 (0.476)	0.005 (0.665)	0.008 (0.504)	0.011 (0.411)
Δ R (-1)	0.003 (0.805)	0.009 (0.422)	0.006 (0.645)	0.002 (0.848)
Δ R (-2)	-0.002 (0.872)	-0.005 (0.633)	-0.013 (0.248)	-0.013 (0.295)
Δ RINVTPC (2)		0.041 (0.181)	0.053* (0.097)	0.065* (0.054)
Δ RINVTPC (1)		0.085*** (0.005)	0.106*** (0.001)	0.103*** (0.003)
Δ RINVTPC		0.106*** (0.000)	0.125*** (0.000)	0.127*** (0.000)
Δ RINVTPC (-1)		-0.024 (0.422)	-0.029 (0.355)	-0.046 (0.173)
Δ RINVTPC (-2)		-0.014 (0.630)	-0.016 (0.580)	-0.025 (0.444)
TREND	0.001 (0.315)	0.000 (0.954)	-0.000 (0.837)	-0.000 (0.719)
Constant	-0.698 (0.476)	0.275 (0.825)	0.631 (0.627)	0.819 (0.556)
Country fixed effects	Yes	Yes	Yes	Yes
No of Cross Sections	5	5	5	5
No of Observations	140	140	140	140

Notes: We use two lags ($p_i = 2$) and two leads ($q_i = 2$). The coefficients for the leads and lags of the difference of the control variables - CREDIT and TRADE - and country fixed effects are not reported. The sample includes all 5 countries. The p-value is in parenthesis. *, ** and *** denote the significance of the coefficient at the 90%, 95%, and 99% confidence interval, respectively.

in the country. Thus, the results support our finding that remittances promote income.

Overall, the cointegration tests show that there is some evidence of a long-run effect of remittances on income and consumption. The evidence for income impact is also supported by the cointegration results for the investment equation. As a next step, we will estimate the impacts of remittances on both income and consumption in Fully Modified Ordinary Least Squares (FMOLS). We choose two lags and two leads for the estimation and constrain both the long-run and short-run coefficients to be identical across all cross-sectional units.

The results for the income equation are presented in Table 7. Similar to the cointegration test, the four specifications are estimated. Column (1) does not include control variables while

columns (2)–(4) control for investment (RINVTPC), financial development (CREDIT), and trade openness (TRADE). The coefficient of the lagged real per-capita income (μ_2) is negative and statistically significant at the 99% confidence interval across all regressions, confirming the cointegration results. The estimate for the association between remittances and per-capita income is positive as expected and also statistically significant. These results show that remittance flows into these South Asian countries are growth enhancing. A one-percent increase in remittance receipt raises income by about 0.23%.⁹

The results also show that remittances do not affect income in the short run while investment affects income in both the short and long run. This makes sense because it takes time for remittances to have an impact on income and investment is the plausible channel that remittances can influence income.

Table 8. *Per-capita consumption equation*

Independent variables	Dependent variable: $\Delta RCPC$			
	No control (1)	Control for RGDPPC (2)	Control for RGDPPC and CREDIT (3)	Control for RGDPPC, CREDIT and TRADE (4)
RCPC (-1)	-0.065** (0.021)	-0.137*** (0.001)	-0.142*** (0.001)	-0.175*** (0.001)
R (-1)	0.014* (0.052)	0.0001 (0.988)	0.004 (0.649)	0.007 (0.437)
RGDPPC (-1)		0.132*** (0.001)	0.131*** (0.001)	0.182*** (0.001)
CREDIT (-1)			-0.001 (0.270)	-0.0001 (0.954)
TRADE (-1)				-0.002* (0.055)
$\Delta RCPC$ (-1)	0.114 (0.187)	0.018 (0.833)	0.019 (0.830)	0.019 (0.828)
$\Delta RCPC$ (-2)	0.237*** (0.005)	0.267*** (0.002)	0.270*** (0.002)	0.267*** (0.003)
ΔR (2)	0.014 (0.400)	-0.009 (0.558)	-0.010 (0.504)	0.002 (0.909)
ΔR (1)	0.036** (0.033)	0.033** (0.031)	0.028* (0.072)	0.026* (0.091)
ΔR	-0.008 (0.600)	-0.006 (0.692)	-0.001 (0.927)	-0.001 (0.918)
ΔR (-1)	-0.014 (0.362)	-0.013 (0.341)	-0.015 (0.251)	-0.019 (0.158)
ΔR (-2)	0.015 (0.280)	0.019 (0.105)	0.021 (0.084)*	0.026 (0.042)**
$\Delta RGDPPC$ (2)		-0.050 (0.604)	-0.040 (0.686)	-0.017 (0.863)
$\Delta RGDPPC$ (1)		0.047 (0.629)	0.030 (0.762)	0.012 (0.901)
$\Delta RGDPPC$		0.581 (0.000)***	0.601 (0.000)***	0.589 (0.000)***
$\Delta RGDPPC$ (-1)		-0.006 (0.955)	0.014 (0.902)	-0.056 (0.628)
$\Delta RGDPPC$ (-2)		-0.218** (0.032)	-0.243** (0.019)	-0.259** (0.012)
TREND	0.001* (0.068)	0.0002 (0.636)	0.001 (0.287)	0.001 (0.462)
Constant	1.863 (0.104)	-0.556 (0.592)	-1.366 (0.260)	-1.081 (0.383)
Country fixed effects	Yes	Yes	Yes	Yes
No of Cross Sections	5	5	5	5
No of Observations	140	140	140	140

Notes: We use two lags ($p_i = 2$) and two leads ($q_i = 2$). The coefficients for the leads and lags of the difference of the control variables - CREDIT and TRADE - and country fixed effects are not reported. The sample includes all 5 countries. The p-value is in parenthesis. *, ** and *** denote the significance of the coefficient at the 90%, 95%, and 99% confidence interval, respectively.

The results for the consumption equation are presented in Table 8. Column (1) is a bivariate specification while columns (2)–(4) control for per-capita income (RGDPPC), financial development (CREDIT), and trade openness (TRADE). The results show that the speed of adjustment (μ_2) is negative and statistically significant across all regressions, indicating a long-run relationship among variables in the specifications. However, the coefficient of the remittance variable is significant only in the bivariate specification (column 1) at the 90% confidence interval while it is not significantly different from zero in other three specifications (columns 2–4). Thus, there is little evidence that remittances are used for consumption purposes.

The coefficient for the difference in remittances at the second lag is statistically significant, showing that there is a short-run

effect of remittances on consumption. The results also show that income is the major factor determining consumption in both the short and long run.

5. ROBUSTNESS CHECK

In a robustness check, we employ Pesaran *et al.*'s (1999) Pooled Mean Group (PMG) estimation of dynamic heterogeneous panels. Different from an earlier method, the PMG estimation technique allows short-run coefficients and error variances to differ across cross-sectional units.¹⁰ The results for all specifications of the income and consumption equations are reported in Table 9. For the income equation, the coefficient (θ) for the speed of adjustment is negative and

Table 9. Robustness check: PMG estimations

Independent variables	Per-capita income equation Dependent variable: Δ RGDPPC				Per-capita consumption equation Dependent variable: Δ RCPC			
	No control	Control for RINVTCP	Control for RINVTCP and CREDIT	Control for RIVTTPC, CREDIT and TRADE	No control	Control for RGDPPC	Control for RGDPPC and CREDIT	Control for RGDPPC, CREDIT and TRADE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
θ	-0.059*** (0.002)	-0.102*** (0.002)	-0.105*** (0.004)	-0.099*** (0.003)	-0.061** (0.012)	-0.324** (0.043)	-0.248 (0.118)	-0.249 (0.110)
R	0.436*** (0.000)	0.243*** (0.000)	0.212*** (0.000)	0.242*** (0.000)	0.024 (0.771)	0.065*** (0.000)	0.052*** (0.001)	0.054*** (0.001)
RINVTCP		0.314*** (0.000)	0.258*** (0.016)	0.308*** (0.007)				
RGDPPC						0.776*** (0.000)	0.842*** (0.000)	0.827*** (0.000)
CREDIT			0.006 (0.157)	0.008 (0.152)			0.002 (0.382)	0.002 (0.359)
TRADE				-0.005 (0.282)				-0.0003 (0.839)
TREND	0.020*** (0.000)	0.008*** (0.006)	-0.009*** (0.005)	0.008** (0.017)	0.047*** (0.000)	-0.008*** (0.000)	-0.009*** (0.005)	-0.009*** (0.000)
Log Likelihood	329.48	344.35	346.53	349.48	300.68	341.13	349.43	357.11
No of Cross Sections	5	5	5	5	5	5	5	5
No of Observations	160	160	160	160	160	160	160	160

Notes: We use one lag. The individual-group short-run coefficients are not reported. The sample includes all 5 countries. The p-value is in parenthesis. *, ** and *** denote the significance of the coefficient at the 90%, 95%, and 99% confidence interval, respectively.

Table 10. Robustness check: including the Philippines

Independent variables	Per-capita income equation Dependent variable: Δ RGDPPC				Per-capita consumption equation Dependent variable: Δ RCPC			
	No control	Control for RINVTCP	Control for RINVTCP and CREDIT	Control for RIVTTPC, CREDIT and TRADE	No control	Control for RGDPPC	Control for RGDPPC and CREDIT	Control for RGDPPC, CREDIT and TRADE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
θ	-0.049*** (0.008)	-0.081** (0.016)	-0.016 (0.623)	-0.063** (0.043)	-0.051** (0.022)	-0.192 (0.150)	-0.209 (0.124)	-0.211 (0.113)
R	0.436*** (0.000)	0.245*** (0.000)	0.249*** (0.009)	0.300*** (0.000)	0.024 (0.774)	0.057*** (0.000)	0.051*** (0.001)	0.053*** (0.001)
RINVTCP		0.317*** (0.000)	0.884*** (0.000)	0.385** (0.025)				
RGDPPC						0.925*** (0.000)	0.846*** (0.000)	0.830*** (0.000)
CREDIT			-0.040*** (0.001)	-0.017*** (0.008)			0.001 (0.498)	0.001 (0.464)
TRADE				-0.012*** (0.001)				-0.0002 (0.869)
TREND	0.020*** (0.000)	0.008*** (0.007)	-0.014** (0.047)	0.004** (0.353)	0.047*** (0.000)	-0.008*** (0.000)	-0.009*** (0.000)	-0.009*** (0.000)
Log Likelihood	381.63	406.18	407.54	417.17	363.61	431.60	439.87	447.61
No of Cross Sections	6	6	6	6	6	6	6	6
No of Observations	194	194	194	194	194	194	194	194

Notes: We use one lag. The individual-group short-run coefficients are not reported. The Philippines is added into the sample. The p-value is in parenthesis. *, ** and *** denote the significance of the coefficient at the 90%, 95%, and 99% confidence interval, respectively.

statistically significant at the 99% confidence interval. Also, the coefficient of the remittance variable is positive and significant at the 99% confidence interval, indicating that there is a long-run impact of remittances on income. The additional results support our findings.

For the consumption equation, the results are not robust across all specifications. In the bivariate specification, the coefficient (θ) for the speed of adjustment is negative and significant, but the coefficient for remittances is not statistically different from zero. While it turns significant when the control

Table 11. Pre-1995 and post-1995 results

Independent variables	Per-capital income equation		Per-capita consumption equation	
	Pre-1995 (1)	Post-1995 (2)	Pre-1995 (3)	Post-1995 (4)
RCPC (−1)			−0.486*** (0.009)	−0.524*** (0.003)
RGDPPC (−1)	−0.213** (0.018)	−0.273*** (0.001)	0.194 (0.409)	0.423*** (0.005)
R (−1)	0.037*** (0.007)	0.044 (0.103)	0.022 (0.269)	0.040 (0.103)
RINVTPC (−1)	−0.014 (0.804)	0.228** (0.016)		
CREDIT (−1)	−0.002 (0.250)	−0.004 (0.147)	−0.002 (0.573)	−0.001 (0.624)
TRADE (−1)	−0.006 (0.027)**	0.001 (0.430)	0.004 (0.418)	−0.001* (0.524)
TREND	0.008*** (0.000)	−0.006 (0.165)	−0.0005 (0.928)	−0.0001 (0.976)
Constant	−14.657*** (0.001)	12.940 (0.137)	2.724 (0.778)	0.735 (0.933)
Country fixed effects	Yes	Yes	Yes	Yes
No of Cross Sections	4	5	4	5
No of Observations	70	70	70	70

Notes: We use two lags ($p_i = 2$) and two leads ($q_i = 2$). The coefficients for the leads and lags of the difference of all variables and country fixed effects are not reported. The p-value is in parenthesis. *, **, and *** denote the significance of the coefficient at the 90%, 95%, and 99% confidence interval, respectively.

variables—income, financial development and trade—are included, the coefficient (θ) for the speed of adjustment becomes statistically insignificant at the conventional confidence interval. This is striking; however, the results indicate that there is little evidence for the robust long-run association between remittances and consumption.

It is also well documented that the Philippines has exported a large number of migrant workers including housemaids, nurses and other professionals to various countries in the globe. Although the Philippines does not belong to the region under this study and possesses different socio-cultural characteristics, one may be curious if the results still hold with the inclusion of the Philippines in the sample. Table 10 reports the results from the PMG estimations for the sample which also includes the Philippines. The results do not change both qualitatively and quantitatively. Except for column 3 where the speed of adjustment (θ) is not statistically different from zero when CREDIT is added to the income equation, other specifications show consistent results for the income equation. The coefficients for remittances indicate that a percent rise in remittances raises income by 0.24% (see column 2) or 0.3% (see column 4).

Again, the results from the consumption equation are not robust across specifications. The results show no long-run relationship between remittance receipt and consumption. Although the speed of adjustment (θ) is negative and statistically significant in the bivariate specification, the coefficient for remittance receipt is not statistically different from zero at the conventional confidence interval.

Also, one may argue that spending behavior may change over time. We test the stability of the impact of remittances on income and consumption by dividing the sample into two equal time periods, pre and post 1995. Because this will shorten the series making it less sufficient for PMG estimations, we rather estimate the error-correction equations and the results are presented in Table 11. The results show that there exists a long-run relationship among variables in both

equations for both sample periods. However, only the coefficient for remittance receipt in the income equation prior to 1995 is statistically different from zero at the 99% confidence interval while it is barely significant at the 90% confidence interval for the post-1995 sample. This could result from a too small time period.

6. CONCLUSION

The paper examines the growth impact of remittance flows into five South Asian countries including Bangladesh, India, Nepal, Pakistan and Sri Lanka. One important characteristic about these countries is that a significant amount of remittances comes from short-term migrant workers who temporarily move to work in the Middle East. Based on the permanent income hypothesis, we argue that because of this temporary income increase, migrant families save and potentially invest the remitted money, thus promoting economic growth.

We employ Pedroni's (2004) cointegration test to examine the long-run impact of remittances on income and consumption. We find evidence of a long-run relationship between income and remittances. The evidence is stronger when the test results indicate that remittances are significantly associated with investment. The cointegration tests also indicate that there is a relationship between consumption and remittances. However, the relationship is weak and become insignificant when the control variables are included. In addition, these findings are also supported by results from both the FMOLS and PMG estimations.

Our findings in these South Asian countries, coupled with the findings of Lim and Simmons (2015) in the Caribbean and Donou-Adonsou and Lim (2016) in West Africa, shed more light onto the important characteristics of migration. They also provide an important implication for the development and migration policies of the labor exporting poor countries. Aside from the saving and spending behaviors of migrant

workers, the return migration also plays an important role in the development of the home countries. These low-skilled workers can be a driving force to support industrialization in the poor countries (Lewis, 1954).

While the paper provides the evidence for the impacts of remittances on income by examining the consumption and investment channels, we still owe a more critical analysis on the issue. As incorporation of all aspects is beyond the scope of the current study, we would like to discuss the issues and if possible we will tackle them in subsequent papers. The first aspect is the impacts of migration and brain drain on the economy. Theoretically, labor migration can raise income per person due to diminishing returns to labor and reduce it in the case of brain drain. Thus, the impact here may be ambiguous. Di Maria and Lazarova (2012) pooled the data of 130 countries from 1990 to 2000 and show that 70% of the countries suffer from slower growth as a result of skilled labor migration. At the same time, it is also interesting to note that specific

to South Asian countries, migration to the Middle Eastern countries is temporary, so there is a high rate of return migration in which migrants may bring more experience and knowledge back home. Another aspect of remittances that is worth noting is the impact of remittances on domestic labor supply. Some micro evidence suggests that remittances reduce the incentive to work. Itzigsohn (1995) finds that remittance recipient households in the Caribbean either stay out of the job markets or send a few members into the labor force. Kim (2007) finds similar evidence for Jamaica. Remittances can also bring the Dutch disease which hurts the export industries from the appreciation of the domestic currency (Acosta, Lartey, & Mandelman, 2009; Gupta, Pattillo, & Wagh, 2009). Last but not least, remittances can have a positive impact on development by reducing poverty (see Adams & Page, 2005; Gupta *et al.*, 2009) and inequality (see Acosta, Calderon, Fajnzylber, & Lopez, 2008).

NOTES

1. There are many reasons that a migrant chooses to invest back home including aspiration to inherit and coinsurance. Lucas and Stark (1985) show that male migrants rather than female tend to send more remittances back to families with large cattle and croplands since sons are more likely than daughters to inherit family assets. We believe that it is also possible that this type of migrants may intend to return at some point in the future. So, they also fall in the category of short-term migrants.
2. However, Doherty, Leung, Lorenze, and Wilmarth (2014) reported that 60% of remittance inflows into Sri Lanka in 2009 came from the Middle East.
3. There is evidence that recruitment firms are responsible for various incidents including irregular migration, violation of human rights, and various forms of abuses (Wickramasekara, 2011). What is important here is the fact that migrant workers move on a contract basis and the term is limited. This is crucial to our assumption that remittances for South Asia are a temporary income shock.
4. According to Doherty *et al.* (2014), return migration rates were calculated by dividing the estimated total number of returnees with total migrant flow during 2001–10. With rising flow of migrants from India and Bangladesh, the method would potentially underestimate the actual return rates because larger population of migrants who just migrated in late 2000s has not returned.
5. For Pakistan, about 7.5 million Pakistanis were recorded to have gone for temporary employment in the Middle East in 2013 (Erdal, 2015).
6. See Pesaran *et al.* (1999) and Blackburne and Frank (2007). Also see the latter for the Stata command.
7. Our analysis is limited to the official data and so the results should be interpreted accordingly. Although the series is not perfect, it has been improved from the previous measure “workers’ remittances” which is the sum of workers’ remittances, compensation of employees, and migrants’ transfers, as defined in the IMF’s Balance of Payment Manual.
8. See Sachs and Warner (1995) and Frankel and Romer (1999) for the impact of trade openness on per-capita income and see King and Levine (1993) and Demirgüç-Kunt and Levine (2008) for the income effect of financial development.
9. 0.019 divided by 0.081.
10. We do not report the short-run coefficients but will make them available upon request.

REFERENCES

- Acosta, P., Calderon, C., Fajnzylber, P., & Lopez, H. (2008). What is the impact of international remittances on poverty and inequality in Latin America?. *World Development*, 36(1), 89–114.
- Acosta, P. A., Lartey, E. K. K., & Mandelman, F. S. (2009). Remittances and the Dutch disease. *Journal of International Economics*, 79, 102–116.
- Adams, R. H., Jr., & Page, J. (2005). Do international migration and remittances reduce poverty in developing countries?. *World Development*, 33(10), 1645–1669.
- Agarwal, R., & Horowitz, A. W. (2002). Are international remittances altruism or insurance? Evidence from Guyana using multiple-migrant households. *World Development*, 30(11), 2033–2044.
- Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Review of Economic Studies*, 58, 277–297.
- Barajas, A., Chami, R., Fullenkamp, C., Gapen, M., & Montiel, P. (2009). Do workers’ remittances promote economic growth? *IMF Working Paper* 153.
- Basnet, H. C., & Upadhyaya, K. P. (2014). Do remittances attract foreign direct investment?. *An Empirical Investigation. Global Economy Journal*, 14(1), 1–9.
- Blackburne, E. F., III, & Frank, M. W. (2007). Estimation of nonstationary heterogeneous panels. *Stata Journal*, 7(2), 197–208.
- Breitung, J. (2000). The local power of some unit root tests for panel data. In B. Baltagi (Ed.), *Advances in econometrics. Nonstationary panels, panel cointegration, and dynamic panels* (Vol. 15, pp. 161–178). Amsterdam: JAI Press.
- Chami, R., Fullenkamp, C., & Jahjah, S. (2005). Are immigrant remittance flows source of capital for development?. *IMF Staff Papers*, 53(1), 33–41.

- Choi, I. (2001). Unit root tests for panel data. *Journal of International Money and Finance*, 20, 249–272.
- Choucri, N., & Brecke, P. (1983). Migration in the Middle East: Transformation and change. *Middle East Review*, 16(2), 16–27.
- Demirgüç-Kunt, A., & Levine, R. (2008). *Finance, financial sector policies, and long-run growth*, M. Spence Growth Commission Background Paper 11. Washington, DC: World Bank.
- Di Maria, C., & Lazarova, E. A. (2012). Migration, human capital formation, and growth: An empirical investigation. *World Development*, 40(5), 938–955.
- Doherty, M., Leung, B., Lorenze, K., & Wilmarth, A. (2014). *Understanding South Asian labor migration*, Workshop in International Public Affairs. The Robert M. La Follette School of Public Affairs, University of Wisconsin - Madison.
- Donou-Adonsou, F., & Lim, S. (2016). An empirical analysis of remittance flows into African economic and monetary union: A panel time series approach. *Applied Economics*, 48(11), 1018–1029.
- Erdal, M. B. (2015). *Pakistan as a return migration destination*, PRIO Policy Brief 13. Peace Research Institute Oslo (PRIO).
- Faini, R. (2007). Migration and remittances: The impact on the countries of origin in migration and development: Mutual benefits? *Proceedings of the 4th AFDEUDN Conference, 2006*. pp. 185–216.
- Feenstra, R. C., Inklaar, R. & Timmer, M. P. (2013). *The next generation of the Penn World Table*. Available for download at www.ggdc.net/pwt.
- Frankel, J. (2011). Are bilateral remittances countercyclical?. *Open Economies Review*, 22, 1–16.
- Frankel, J. A., & Romer, D. (1999). Does trade cause growth?. *American Economic Review*, 89, 379–399.
- Friedman, M. (1957). *A theory of the consumption function*. Princeton, NJ: Princeton University Press.
- Gupta, P. (2005). Macroeconomic determinants of remittances: Evidence from India. *IMF Working Papers 05/004*.
- Gupta, S., Pattillo, C. A., & Wagh, S. (2009). Effect of remittances on poverty and financial development in Sub-Saharan Africa. *World Development*, 37(1), 104–115.
- Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics*, 115, 53–74.
- International Monetary Fund (2005). Two current issues facing developing countries. In *World economic outlook: Globalization and external imbalances*. Washington, DC: IMF.
- Itzigsohn, J. (1995). Migrant remittances, labor markets, and household strategies: A comparative analysis of low-income household strategies in the Caribbean Basin. *Social Forces*, 74(2), 633–655.
- Khadria, B. (2008). India: Skilled migration to developed countries, labour migration to the Gulf. In S. Castles, & R. D. Wise (Eds.), *Migration and development: Perspectives from the South*. Geneva: International Organization for Migration.
- Kim, N. (2007). *The impact of remittances on labor supply: The case of Jamaica*, World Bank Policy Research Working Paper 4120. World Bank.
- King, R., & Levine, R. (1993). Finance, entrepreneurship, and growth: Theory and evidence. *Journal of Monetary Economics*, 32(3), 513–542.
- Lewis, W. A. (1954). Economic development with unlimited supplies of labour. *The Manchester School*, 22(2), 139–191.
- Lim, S., & Morshed, A. K. M. M. (2015). International migration, migrant stock, and remittances: Reexamining the motivations to remit. *Quarterly Review of Economics and Finance*, 57, 101–115.
- Lim, S., & Simmons, O. W. (2015). Do remittances promote economic growth in the Caribbean Community and common market?. *Journal of Economics and Business*, 77, 42–59.
- Lucas, R. E. B., & Stark, O. (1985). Motivation to remit: Evidence from Botswana. *Journal of Political Economy*, 93, 901–918.
- Lueth, E., & Ruiz-Arranz, M. (2008). Determinants of bilateral remittance flows. *The B.E. Journal of Macroeconomics*, 8(1), 1–21 (Article 26).
- Nsiah, C., & Fayissa, B. (2013). Remittances and economic growth in Africa, Asia, and Latin American-Caribbean countries: A panel unit root and panel cointegration analysis. *Journal of Economics and Finance*, 37(3), 424–441.
- Pedroni, P. (2004). Panel cointegration: Asymptotic and finite sample properties of pooled time series tests with an application to the PPP hypothesis. *Econometric Theory*, 20, 597–625.
- Pesaran, M. H., Shin, Y., & Smith, R. P. (1999). Pooled mean group estimation of dynamic heterogeneous panels. *Journal of the American Statistical Association*, 94(446), 621–634.
- Puri, S., & Ritzema, T. (1999). *Migrant worker remittances, micro-finance and the informal economy: Prospects and issues*, Social Finance Unit Working Paper 21. Geneva: International Labor Office.
- Ramirez, M. D., & Sharma, H. (2008). *Remittances and growth in Latin America: A panel unit root and panel cointegration analysis*, Economics Development Working Paper No. 51. Yale University.
- Rapoport, H., & Docquier, F. (2006). The economics of migrants' remittances. In S. C. Kolm, & J. M. Ythier (Eds.), *Handbook of the economics of giving, altruism and reciprocity* (vol. 2, pp. 1135–1198). Amsterdam: North-Holland.
- Ratha, D. (2007). Leveraging remittances for development. In *Policy brief: Program on migrants, migration, and development*. Washington, DC: World Bank.
- Sachs, J. D., & Warner, A. (1995). Economic reform and the process of global integration. *Brookings Papers on Economic Activity*, 1–95.
- Singh, R. J., Haacker, M., Lee, K.-W., & Le Goff, M. (2010). Determinants and macroeconomic impact of remittances in Sub-Saharan Africa. *Journal of African Economies*, 20(2), 312–340.
- Westerlund, J. (2007). Testing for error correction in panel data. *Oxford Bulletin of Economics and Statistics*, 69, 709–748.
- Wickramasekara, P. (2011). *Labour migration in South Asia: A review of issues, policies and practices*, International Migration Paper No. 108. Geneva: International Labour Office.
- World Bank (2015). *Migration and development brief 24. Migration and Remittances Team*, Development Prospect Group.
- World Bank (2016). *World Development Indicators online*.
- Yang, D. (2011). Migrant remittances. *Journal of Economic Perspectives*, 25(3), 129–152.
- Ziesemer, T. (2006). Worker remittances and growth: The physical and human capital channels. *UNU-MERIT Working Paper Series, No. 020*.