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Remittances and Economic Growth Nexus and Role of Financial Sector in the Indian Subcontinent: A Panel Study

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ABSTRACT

This paper undertakes a panel study of the nexus between inward remittances (REM) and growth in gross domestic product per capita (RGDPC) in the six countries in the Indian sub-continent, namely Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka, the objective of the study, which covers a 16-year period (2000-15) is to assess the role of financial sector development, presently supported by the spread of information communication technology (ICT) towards promoting financial inclusion. The study findings confirm that remittances have been a positive and significant contributor to growth in RGDPC. The financial sector, development indicator is represented by the variable bank credit to private sector (PSC) and ICT, which is proxied by the variable, namely number of mobile phones per 100 people, have also been observed to be directly associated with RGDPC. However, the negative sign of the interaction term (REM*PSC), suggests that REM and PSC act substitutes, rather than complements. The policy conclusion is that the ongoing efforts by the six SAARC countries should up development of financial sector further more by vigorously promoting the spread of branchless banking through ICT.

Key words: Remittances, growth, financial sector, financial inclusion, Indian subcontinent countries
JEL Codes: C33, F24; F43; O11

1.INTRODUCTION

Annual remittances (REM) sent by migrants, working and resident overseas, to families left behind in their home countries rose by 82 percent from US$330 billion in 2006 to reach a new high at US$ 598 billion in 2014[1]. Though they decreased to US$ 583 billion in 2015 and US$ 575 billion in 2016, as a consequence of the recession in the in the industrialized countries since 2008, (World Bank 2017), REM has emerged to be number one amongst the three non-debt creating transfers, the other two being official development assistance (ODA)

and foreign direct investment (FDI).Besides supplementing domestic savings, REM inflows are now seen as additions to real resources of the country.

They are in the form of foreign exchange, which would have to be earned under normal circumstances by exporting limited ange of exports of goods. According to conventional wisdom, the nexus between REM and economic growth is mainly through consumption by recipient families and consequently, they step up domestic aggregate demand. Increases in consumption expenditures on food, clothing and medicines and children's education were facilitated by REM inflows, alleviating poverty to a greater extent. However, steady annual inflows of REM in the absence of any avenues for savings mobilization in rural areas with no access to banks and other savings institutions tend to get frittered away on needless and avoidable consumption.If there were opportunities for savings by way of access to banking services, additions to reserves in banks would enable recycling of REM as credit to the would-be investors in domestic small and medium enterprises. It is well known that well-functioning financial markets, by lowering costs of conducting transactions, facilitate directing REM receipts to projects that yield the highest return, and thereby enhance economic growth. Bettin and Zazzaro (2012) and Giuliano and Ruiz-Arranz (2009) in their panel studies about 100 developing countries, focused their attention on financial sector development (FSD) as a contingent factor. Their findings led to the conclusion that in financially deeper systems, the growth effects of remittances are likely to be enhanced confirming the hypothesis of a complementary relationship of remittances with financial flows into growth enhancing investment areas. Realizing the potential of well developed FSD together with financial inclusion efforts through digitization measure bringing banks nearer to citizens in rural areas and in accessible parts of the countries, governments all over the world have been promoting various measures. This paper focuses attention on six South Asian countries, namely Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka[2]. These six countries, being members of a formal regional organization, known as South Asian Association of Regional Cooperation (SAARC) founded in 1985 are also collectively referred to SAARC countries. Among the six SAARC countries, India has been the highest receiver of REM in absolute terms; and Nepal has been among the list of first top 10 receivers of REM in terms of percentage of GDP.

The objectives of the panel study, which covers a 16-year period (2000-15) are two-fold: (i) to evaluate the contribution of REM to growth of the economies in the SAARC region, and (ii) to investigate the roles of FSD and digitization process as contingent factors. So far, there has been no study on six SAARC countries focusing on the roles of FSD and information and communication technology (ICT), which has been speeding digitization process.

The paper is organized as follows: Section 2 gives a brief review of literature on remittances and growth with special reference to role of FSD and ITC; Section 3 presents the trends in remittances in six SAARC countries. Section 4 outlines the empirical model and data sources; Section 5 discusses the results while Section 6 is a summary with conclusions and policy implications.

2. REVIEW OF LITERATURE

Remittances, known as cross-border transfers of earnings[3] sent by migrants to their countries of origin, which are channeled through official and unofficial channels, have grown over last three decades. The official channels are either through banking systems or authorized money-

transfer agencies. It is estimated nearly 50 percent of remittances received in Sub-Saharan Africa were through unauthorized channels (World Bank, 2011), which have proved to be at high cost. The global average transaction cost of remitting, say US$ 200 which was once as high as at 25 percent more than two decades ago came come down to 10 percent by 2010, with further welcome decreases over the period to reach 7.4 percent in the last quarter of 2015. However, it is still higher than the targeted rate of 3 percent by 2030 (World Bank, 2017), which is one of the United Nations (UN) Sustainable Development Goal Indicators (World Bank 2016b). The UN and inter-governmental efforts are still on to promote the continuing ease of sending money by authorized channels.

Contribution of remittances to growth

The World Bank (2011; 2016c) reports that remittances from migrants (who are estimated to be more than 250 million, which is 3.4 percent of the world population in 2015) to developing countries have grown from US$69 billion in 1990 to US$132 billion in 2000, and US$332 billion in 2010 and touched a high of US$ 583 billion in 2015. Remittances have now emerged to be the most important source of external finance to developing countries, about 40 percent of which went to rural communities in the recipient countries. Further, it has been noted by UN Conference Trade and Development (Mashayekhi, 2014) that remittances grew faster than FDI and ODA during a ten year (2003-2012) period.

A review of past studies has shown there are two kinds of impacts of transfers of capital transfers: positive and negative. Studies, both country specific and panel, which include Stahl & Habib, 1989; Adleman& Taylor, 1990; Leon-Ledesma &Piracha,2001; Edwards & Ureta, 2003; Page & Adams, 2003; Hildebrandt & McKenzie, 2005; World Bank, 2006; Yang, 2008;Bettin& Zazzaro,2012;Giuliano & Ruiz-Arranz, 2009*)* have established the positive consequences of remittances, as they (i) supported the welfare of the families left behind, thereby alleviating their poverty; (ii) helped the recipient families to upgrade their dwellings and undertake investments towards improving their farming operations; (iii) enabled families to pay education fees for children and bear expenses of medical care of the elderly; and (iv) added to the foreign reserves of the recipient country , thereby raising the level of its credit worthiness for undertaking growth enhancing investments with loans from international funding agencies.

Negative impacts of remittances

The negative impacts have been noted to include (i) encouraging greater migration possibilities of skilled manpower, thereby leading to brain drain; (ii) inducing consumption of imports of luxury goods and avoidable trade deficits; and (iii) resulting in higher demand for non-tradeables including electricity and water, pushing up the domestic price level, raising the real exchange rate and hurting the competiveness of limited range of exportables, known as the phenomenon of Dutch disease.

Evidence gathered suggests that with appropriate policies and remedial measures negative impacts can be more than offset. The remedial measures include appropriate investments in domestic water supply, electricity generation and other infrastructures by utilizing the foreign exchange resources brought in by remittance inflows. These remedial measures aside from promoting growth enhancing investments by efficient use of valuable foreign exchange resources brought in by REM enable the country to have a relatively lower rate of domestic inflation due to fall in the prices of non-tradables (Jayaraman, Choong & Chand, 2016).

Role of Financial Sector Development

The developmental impact of remittances can be enhanced only when savings made by recipients out of their remittances are mobilized by financial sector institutions for recycling them as credit. In the absence of access to banking institutions, families in the rural parts of developing countries, which are reported to receive about 40 percent of remittances (Mashayeki,2014) tend to fritter away their savings on avoidable consumption. Since only 50 percent of adults (15 years plus) have been found to have accounts with a formal financial institution, most of the recipient families in rural areas, which have been found to be facing challenges in accessing financial services and as well as credit for undertaking small enterprises. In developing countries only 34 percent of firms have a bank loan as compared to 51 percent in developed countries. Nearly 80 percent of microenterprises and small and medium enterprises in the informal sector do not have access to bank credit and they are forced to seek funds at high interest rates from outside the formal financial sector (Mashayekhi, 2014).

Recognizing the need for promoting greater access to financial services, the United Nations (UN) has included financial inclusion, as a major goal in its post 2015 Development Framework[4] which is defined as "effective access and use by individuals and firms of access of affordable and sustainable financial services from formal providers" (United Nations, 2015). Empirical studies incorporating FSD as a variable in their studies on remittance-growth nexus (Calderon *et al.,* 2008; Ramirez & Sharma, 2008; Giuliano & Ruiz-Arranz, 2009; Nyamongo *et al*., 2012; Bettin&Zazzaro, 2012) employed quantity-based indicators. These are the ratio of domestic credit provided by the banking sector to GDP, the ratio of bank deposits to GDP and the ratio of claims on private sector.

Evidence assembled by these studies shows that REM act as substitute for credit in countries where a large proportion of households have no access to FSD institutions to approach credit are forced to borrow either from money lenders or to borrow at a large premium over the risk adjusted interest rate. In such cases as well cases where the borrowers have no collateral are allowed to rely on remittances by pledging the latter as collaterals (Paulson & Townsend, 2010). Well-functioning banks, which attract remittances on a regular basis do lower monetary cots of opening deposits and allow financial resources to be channeled to productive investments after sufficient screening and ensuring viability of projects (Freund and Spatafora, 2008)

Substitutes or complements

Giuliano and Ruiz-Arranz (2009) observe remittances become a substitute for the small and weak financial sector. That is, in a country with thin credit markets, the marginal impact of remittances is much higher. On the other hand, in a country, where FSD is strong with widespread credit markets, and where liquidity constraints do not pose a problem, remittances may actually be used for consumption. In the former case of substitutability, the sign of the coefficient of remittances in econometric analyses with real GDP as dependent variable would be positive and significant and coefficient of the interaction action term would be negative and significant. In the second and complementary relationship case, signs of the coefficient of remittances and interaction term would be both positive and significant.

Evidence gathered by various studies find the existence of predominant support in favour of the hypothesis of substitutability between remittances and loan finance. These studies include those onLatin American and Caribbean countries: Calderon *et al.,* (2008); Ramirez and Sharma (2008); Barajas *et al.* (2009); and Bettin and Zazzaro (2012). However, Bettin and Zazzaro (2012) argue by quoting the findings of Nyamongo *et al*. (2012) and Zouheir and

Sghaier (2014) observe that there is a contradicting piece of evidence in regard to relationship between remittances and financial development. In African countries, where financial sector is weak, the two variables are seen as complements, strengthening the positive impact of remittances on growth. As remittances can be deposited in banks, they bring a larger share of the population in contact with the financial sector, expanding the availability of credit and savings products (Aggarwal et.al 2011).

REVIEW OF TRENDS IN REMITTANCES, FINANCIAL INCLUSION AND FINANCIAL SECTOR DEVELOPMENT

REM. ODA and FID are debt free transfers. Table 1 presents trends in the transfer of resources free of any debt burden imposed by them, as they become additions to foreign exchange, which would have to be earned through commodity exports. Among the three, while ODA has declined in importance reduced to third rank over a period of three decades, remittances have emerged as number one followed by FDI. Table 2 analyses the trends in all three resource flows to SAARC countries both in billions of US dollars as percentages of GDPs of respective countries. India was the highest receiver of REM in absolute amounts of dollars amongst the six SAARC countries. India was ranked number one in the list of first ten top receivers (Table 3). However, REM accounted only a small percent of India's GDP.

Table 1: Resource Transfers: Remittances, FDI, and ODA: 1990-2015 (US$ billion and percent of GDP)

	1980	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
World (US$ billion)																			
Remittance	***37.0***	***67.9***	***102.4***	***121.3***	***131.5***	***152.0***	***185.7***	***213.7***	***252.8***	**293.0**	**350.2**	**405.9**	**387.8**	**417.5**	**469.4**	**494.6**	**522.7**	**552.9**	**553.0**
FDI	51.5	196.3	319.9	1460.7	796.1	741.5	707.6	1004.3	1522.3	2136.1	3065.4	2443.7	1360.8	1860.3	2283.4	2125.1	2084.5	1780.1	2135.7
Foreign Aid	34.5	60.3	65.8	56.2	57.1	67.0	77.2	87.0	108.2	106.8	107.4	127.1	126.5	130.7	141.6	133.4	151.1	161.6	152.5
World (% of GDP)																			
Remittances	0.42	0.40	0.35	0.37	0.41	0.45	0.49	0.50	0.54	0.58	0.62	0.65	0.66	0.65	0.65	0.67	0.69	0.72	0.76
FDI	0.52	0.91	1.06	4.36	2.40	2.14	1.81	2.22	3.22	4.16	5.22	3.75	2.16	2.74	3.02	2.74	2.56	2.19	2.81
ODA	0.3	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
South Asia (US$ billion)																			
Remittances	5.3	5.6	10.0	17.2	19.2	24.1	30.4	28.7	34.2	42.5	54.0	71.7	74.9	82.0	96.4	108.0	110.8	115.8	117.7
FDI	0.20	0.5	2.9	4.4	5.8	6.4	4.8	7.5	10.8	25.5	32.5	51.2	39.6	31.6	40.7	27.8	33.5	40.3	49.6
Foreign Aid	5.26	5.96	5.17	4.14	5.94	6.87	6.02	6.98	9.41	9.28	11.53	12.34	14.56	15.46	16.93	14.13	13.94	15.59	15.63
South Asia (% of GDP)																			
Remittances	2.2	1.4	2.1	2.7	3.0	3.6	3.9	3.1	3.3	3.5	3.7	4.7	4.5	4.0	4.2	4.7	4.7	4.5	4.4
FDI	0.08	0.13	0.61	0.70	0.90	0.94	0.61	0.81	1.03	2.12	2.18	3.38	2.38	1.55	1.79	1.21	1.42	1.56	1.85
Foreign Aid	2.18	1.45	1.07	0.66	0.93	1.01	0.76	0.76	0.89	0.77	0.77	0.81	0.87	0.76	0.74	0.61	0.59	0.61	0.58

Rising remittances

On the other hand, REM received by Nepal as a proportion of its GDP was high enough to be ranked as the second highest among the ten top recipients of REM as percent of GDP (Tables 4 and 5).

Table 2: Six SARRC Countries- Receipt of Resource Transfers (US$ billion)

	1980	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Bangladesh																			
Remittance	0.34	0.78	1.20	1.97	2.10	2.86	3.19	3.58	4.64	5.43	6.56	8.94	10.52	10.85	12.07	14.12	13.87	14.99	15.39
FDI	0.01	0.00	0.00	0.28	0.08	0.05	0.27	0.45	0.76	0.46	0.65	1.33	0.90	1.23	1.26	1.58	2.60	2.54	3.38
Foreign Aid	1.29	2.09	1.28	1.17	1.05	0.90	1.40	1.42	1.32	1.22	1.51	2.07	1.23	1.40	1.49	2.15	2.63	2.42	2.57
Bhutan																			
Remittances	NA	Na	NA	NA	NA	NA	NA	NA	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.01	0.01	0.02
FDI	NA	0.00	0.00	NA	NA	0.00	0.00	0.01	0.01	0.01	0.07	0.00	0.02	0.08	0.03	0.02	0.05	0.01	0.03
ODA	0.01	0.01	0.01	0.01	0.02	0.02	0.04	0.04	0.04	0.04	0.05	0.06	0.06	0.07	0.08	0.07	0.06	0.07	0.06
India																			
Remittances	2.76	2.38	6.22	12.88	14.27	15.74	21.00	18.75	22.13	28.33	37.22	49.98	49.20	53.48	62.50	68.82	69.97	70.39	68.91
FDI	0.08	0.24	2.14	3.58	5.13	5.21	3.68	5.43	7.27	20.03	25.23	43.41	35.58	27.40	36.50	24.00	28.15	34.58	44.01
Foreign Aid	2.19	1.40	1.74	1.38	1.73	1.76	0.72	0.78	1.88	1.38	1.34	2.13	2.47	2.83	3.27	1.68	2.46	2.99	3.16
Nepal																			
Remittances	NA	NA	0.06	0.11	0.15	0.68	0.77	0.82	1.21	1.45	1.73	2.73	2.98	3.46	4.22	4.79	5.59	5.89	6.73
FDI	0.00	0.01	NA	0.00	0.02	-0.01	0.01	0.00	0.00	-0.01	0.01	0.00	0.04	0.09	0.09	0.09	0.07	0.03	0.05
Foreign Aid	0.16	0.42	0.43	0.39	0.39	0.34	0.46	0.43	0.42	0.53	0.60	0.70	0.85	0.81	0.89	0.77	0.87	0.88	1.22
Pakistan																			
Remittances	2.05	2.01	1.71	1.08	1.46	3.55	3.96	3.95	4.28	5.12	6.00	7.04	8.72	9.69	12.26	14.01	14.63	17.24	19.31
FDI	0.06	0.25	0.72	0.31	0.38	0.83	0.53	1.12	2.20	4.27	5.59	5.44	2.34	2.02	1.33	0.86	1.33	1.87	0.98
Foreign Aid	1.18	1.13	0.82	0.71	1.95	2.11	1.07	1.43	1.62	2.18	2.27	1.55	2.76	3.02	3.50	2.02	2.19	3.61	3.79
Sri Lanka																			
Remittances	0.15	0.40	0.81	1.15	1.17	1.30	1.42	1.57	1.98	2.17	2.51	2.92	3.34	4.12	5.15	6.00	6.42	7.04	7.00
FDI	0.04	0.04	0.06	0.17	0.17	0.20	0.23	0.23	0.27	0.48	0.60	0.75	0.40	0.48	0.96	0.94	0.93	0.89	0.68
Foreign Aid	0.39	0.73	0.55	0.28	0.34	0.34	0.68	0.51	1.16	0.79	0.61	0.72	0.70	0.58	0.61	0.49	0.40	0.49	0.43

Table 3: Six SAARC Countries: Receipt of Resource Transfers (percent of GDP)

	1980	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Bangladesh																			
Remittance	1.87	2.46	3.17	3.69	3.90	5.22	5.31	5.50	6.69	7.56	8.24	9.76	10.27	9.41	9.38	10.59	9.25	8.67	7.89
FDI	0.047	0.010	0.005	0.525	0.145	0.096	0.446	0.689	1.095	0.636	0.818	1.450	0.879	1.069	0.983	1.188	1.735	1.469	1.733
Foreign Aid	7.09	6.49	3.28	2.13	1.88	1.58	2.23	2.09	1.82	1.61	1.79	2.10	1.11	1.13	1.07	1.49	1.63	1.31	1.24
Bhutan																			
Remittances	NA	NA	NA	NA	NA	NA	NA	NA	0.00	0.25	0.25	0.28	0.38	0.52	0.57	0.99	0.66	0.73	0.96
FDI	..	0.53	0.02	..	..	0.45	0.54	1.26	0.76	0.68	6.17	0.25	1.45	4.75	1.71	1.34	2.77	0.43	1.63
ODA	7.31	16.36	27.55	12.17	12.77	13.88	12.64	11.40	11.16	10.70	7.71	6.95	10.49	8.77	8.28	9.61	8.17	7.16	5.19
India																			
Remittances	1.45	0.73	1.70	2.70	2.89	3.00	3.40	2.60	2.65	2.99	3.10	4.21	3.72	3.23	3.43	3.76	3.77	3.46	3.30
FDI	0.04	0.07	0.58	0.75	1.04	0.99	0.60	0.75	0.87	2.11	2.10	3.66	2.69	1.65	2.00	1.31	1.52	1.70	2.11
Foreign Aid	1.15	0.43	0.48	0.29	0.35	0.34	0.12	0.11	0.23	0.15	0.11	0.18	0.19	0.17	0.18	0.09	0.13	0.15	0.15
Nepal																			
Remittances	NA	NA	1.29	2.03	2.45	11.21	12.18	11.31	14.91	16.07	16.79	21.74	23.21	21.65	22.37	24.96	28.82	29.72	31.75
FDI	0.02	0.16	..	-0.01	0.35	-0.10	0.23	-0.01	0.03	-0.07	0.06	0.01	0.30	0.55	0.50	0.48	0.38	0.15	0.24
Foreign Aid	8.17	11.62	9.75	7.01	6.45	5.67	7.35	5.87	5.19	5.79	5.79	5.50	6.56	5.05	4.68	3.98	4.47	4.39	5.64
Pakistan																			
Remittances	8.64	5.01	2.82	1.45	2.02	4.92	4.76	4.03	3.91	3.73	3.94	4.14	5.18	5.46	5.74	6.24	6.33	7.06	7.12
FDI	0.27	0.61	1.19	0.42	0.52	1.14	0.64	1.14	2.01	3.11	3.67	3.20	1.39	1.14	0.62	0.38	0.58	0.76	0.36
Foreign Aid	4.61	2.70	1.35	0.97	2.73	2.90	1.25	1.43	1.45	1.56	1.47	0.89	1.60	1.64	1.57	0.85	0.90	1.40	1.32
Sri Lanka																			
Remittances	3.77	4.99	6.21	7.07	7.43	7.84	7.54	7.62	8.09	7.66	7.75	7.18	7.93	7.27	7.89	8.77	8.64	8.79	8.50
FDI	1.07	0.54	0.43	1.06	1.09	1.19	1.21	1.13	1.12	1.70	1.86	1.85	0.96	0.84	1.46	1.38	1.25	1.12	0.83
Foreign Aid	9.51	9.13	4.31	1.74	2.17	2.08	3.61	2.49	4.83	2.83	1.90	1.82	1.69	1.03	0.95	0.73	0.56	0.63	0.53

Source: World Development Indicators

Table 4: **World's Ten Top Receivers of Remittances in 2016 (US$ billion)**

Countries	US$ (billion)
India	62.7
China	61
Philippines	29.9
Mexico	28.5
Pakistan	19.8
Nigeria	19
Egypt	16.6
Bangladesh	13.7
Vietnam	13.4
Indonesia	9.2

Source: World Bank 2017a.

Table 5: **World's Ten Top Receivers of Remittances in 2016 ((% of GDP)**

Countries	% of GDP
Kyrgyz	34.5
Nepal	29.7
Liberia	29.6
Haiti	27.8
Tonga	27.8
Tajikistan	26.9
Maldova	21.7
Comoros	21.2
Gambia	20.4
Honduras	18.4

The phenomenon of REM becoming most important of three non-debt creating transfers of resources is now world-wide and recognized. While ODA and FDI inflows were declining both in absolute amounts as well as percent of GDP in recent years due to recession in donor countries as well as changes in donor priority considerations, the rise in the unrequited transfer of resources, The REM is now given greater attention by government as a one of the effective ways of augmenting financial as well as real resources.

For the poor households, REM is a boon since they have been supplementing disposable incomes of the recipient families (Chami and Fullenkamp 2013). The funds received are seen spent on consumption of clothing, food, medicine and shelter. They have also enabled them to invest in education and health care, besides investments in semi durable goods. As a a supportive source of funds to enterprising families, REM help the small scale rural entrepreneurs undertake simple food processing microenterprises. Thus, these families look upon remittances as a source of funding new production opportunities for commercial purposes.As remittances relax credit constraints imposed by undeveloped financial sectors, governments have realized the immense potential of remittances in triggering economic development entrepreneurial efforts. Therefore, governments all over the world are now promoting FSD by encouraging spread of ICT and digitization process in all economic activities including banking and finance.

Financial inclusion

In the context of South Asia's efforts towards developing the financial sector, financial inclusion has been aptly defined as "the process of ensuring access to financial services, and timely and adequate credit where needed, by vulnerable groups, such as weaker sections and low-income groups, at an affordable cost" by an official committee of the Government of

India (2009). Financial inclusion, so defined, would enable FSD providing universal access to a wide range of financial services beyond banking, such as insurance and equity products by utilizing technological innovations such as ATMs, credit and debit cards, internet banking, electronic benefit transfer, and usage of mobile phones. It would also help encouraging commercial banks, as they would perceive the immense benefits from mobile technology which would go far beyond the conventional measures of expensive bank branches in inaccessible rural areas and hilly regions. Indeed, the mobile phones would develop banks to prosper through branchless banking or branches built with "no brick or mortar".

Table 6 presents a comparative picture of financial inclusion indicators amongst the SAARC countries. The data are based on based on annual surveys (World Bank 2017) It reveals Sri Lanka is the leading country in 2015, with nearly 83 percent of the adult population (age +15) has accounts with financial institutions; and 30 percent have been receiving remittances through financial institutions.

While the proportion of the adult population using mobile banking accounts in Pakistan was the highest at 5.8%, followed by Bangladesh (2.7%), the least proportion was in Sri Lanka. As regards usage of ATM, Bhutan led the SAARC countries at 51.3%, while the second closest was India (33.1%) the Bangladesh being the least user (7.5%). The highest use of debit card by adult population was in Sri Lanka (24.9%), followed by India (22.1%), the least use being in Pakistan (2.9%).

FSD Indicators

Amongst various indicators of FSD, researchers in the past have been using broad money (BM) as a variable for representing the financial deepening of the system. The term BM refers to sum of demand deposits and savings and time deposits of various periods of maturity. However, in recent studies, bank credit to private sector (PSC) as percent of GDP has emerged to be a better indicator, as it reflects the ability of borrowers to borrow successfully after fulfilling the credit appraisal and credit worthiness requirements by banking institutions. The relevant data series employed in the analysis are provided in Appendix.

Table 6: **Financial Inclusion Indicators: World, South Asia, and Six SAARC Countries**

Categories	World	South Asia	Bangladesh	Bhutan	India	Nepal	Pakistan	Sri Lanka
Accounts (2015)								
All	61.5	46.4	31.0	33.7	53.1	33.8	13.0	82.7
Women	58.1	37.4	26.5	27.7	43.1	31.3	4.8	83.1
Financial Institution Account								
Adults (% age +15)								
All (2015)	60.7	45.5	29.1	33.7	52.8	33.8	8.7	82.7
All (2011)	50.6	32.3	31.7	NA	35.2	25.3	10.3	68.5
Mobile Account (% age +15)								
2015	2.0	2.6	2.7	NA	2.4	0.3	5.8	0.1
Access to Financial Institution Account								
Has Debit Card (% age +15)								
2015	40.1	18.6	5.2	17.2	22.1	6.7	2.9	24.9
2011	30.5	7.2	2.3	NA	8.4	3.7	2.9	10.0
ATM is the main mode of withdrawal with Account (%)								
2015 (% age +15)	NA	31.1	7.5	51.3	33.1	13.9	NA	24.3
2011 (% age +15)	48.1	16.9	2.8	NA	18.4	11.8	32.4	15.4
Use of Accounts in the past one year (age +15 %) 2015								
To receive wages	17.7	3.5	1.6	6.4	4.0	2.4	1.4	7.1
To receive government transfers	8.2	3.1	0.4	0.5	3.6	0.5	1.8	5.3

To pay utility bills	16.7	2.7	0.4	1.1	3.4	0.0	0.4	1.1
Other digital payment :2015								
Use of debit card (% age +15)	23.2	8.5	1.0	10.1	10.7	2.6	1.0	10.4
use of credit card (% age +15)	15.1	2.6	0.2	0.0	3.4	0.1	0.1	2.8
use of internet (% age +15)	16.6	1.2	0.4	0.8	1.2	0.4	1.8	1.6
Received remittances 2015								
Via Financial Institutions (% age +15)		15.8	8.6	23.0	15.8	20.5	4.6	30.2
Via Mobile phones (% age +15)		4.7	17.3	0.2	4.7	0.0	4.3	0.0
Via Money operators (% age +15)		9.8	2.4	10.9	9.8	20.9	11.2	0.5

Source: World Bank (2017).

MODELING, DATA AND METHODOLOGY

The functional relationship is formulated thus:

$$RGDPC = f(\text{INV, REM, PSC, REMPSC, MOBILE})$$

The empirical model for estimation purposes is written as follows

$$RGDPC_{i,t} = \beta_0 + \beta_1 INV_{i,t} + \beta_2 REM_{i,t} + \beta_3 PSC_{i,t} + \beta_4 REMPSC + \beta_5 MOBILE + \varepsilon_{i,t} \quad (1)$$

where,

RGDPC = real GDP per capita in constant US$ (2010 prices)
INV = investment as percentage of GDP;
REM = remittance inflows as percent of GDP;
PSC = bank credit as percent of GDP;
REMPSC = interaction term of REM and PSC;
MOBILE = Mobile per 100 people;
ε = white noise error term.

The subscript i refers to the observation in the ith country and the subscript *t* to the year of the observation.

With the growing interest of cross-country data over time especially in empirical macroeconomic, the focus of panel data econometrics has shifted towards the stationary and cointegration dimensions (Asteriou and Hall, 2016; Baltagi, 2013). To this end, this research adopts the non-stationary panel data analysis which considers a larger T (length of time series) compared to N (number of countries) rather than the usual panels with large *N* and small T[5]. Our study uses accordingly the more sophisticated panel cointegration tests along the lines of Pedroni (1999, 2001, 2004) and Kao (1999).

Empirical Tests

We adopt the procedures of Maddalaand Wu (1999), Hadri (2000), Levin et al., (2002) and Im et al., (2003) for conducting panel unit root and stationarity tests in order to unleash more conclusive evidence with regard to the order of integration of the series under investigation. The null hypothesis of these tests is that the panel series has a unit root (non-stationary)

except for the Hadri test. The Hadri test is similar to the KPSS type unit root test, with a null hypothesis of stationarity in the panel.

For examining the existence of any long run equilibrium relationship between the variables under investigation, we resort to Pedroni (1999, 2001, 2004) and Kao (1999) panel cointegration tests. Pedroni (1999, 2001, 2004) considers seven different statistics, four of which are based on pooling the residuals of the regression along the within-dimension (panel test) of panel and the other three are based on pooling the residuals of the regression along the between-dimension (group test) of the panel.

The within-dimension tests take into account common time factors and allow for heterogeneity across countries. The between-dimension tests are the group-mean cointegration tests, which allow for heterogeneity of parameters across countries. Meanwhile, Kao (1999) proposed DF and ADF-type tests for ε_{it} where the null is specified as no cointegration. In this study, we only report the ADF-type test.

To obtain the long run estimates of the cointegrating relationship, we adopt the panel group mean Fully Modified OLS (FMOLS) following the work by Pedroni (2000). The FMOLS procedure accommodates the heterogeneity that is typically present both in the transitional serial correlation dynamics and in the long run cointegrating relationships.

To specify the causal direction of these variables, we rely on the panel non-causality test developed by Dumitrescu and Hurlin (2012). This is a simple extension of the Granger (1969) relax the '*homogeneity*' of cross-section units assumption made by Holtz-Eakin, Newey and Rosen (1988, 1989) in the panel data setting[6]. By preserving the heterogeneity of cross-sectional units, it allows us to test the direction of causality between these macroeconomic variables without imposing the same dynamic model for all the countries of the sample. We consider the panel heterogeneous autoregressive model as follows:

$$y_{it} = \phi_i + \sum_{k=1}^{K} \gamma_i^{(k)} y_{i,t-k} + \sum_{k=1}^{K} \beta_i^{(k)} x_{i,t-k}^{'} + \varepsilon_{i,t} \quad (2)$$

Where *x* and *y* are two stationary variables, observed on *t* periods for *n*countries. The panel is balanced, individual effects are assumed to be fixed and the lag-order *k* are identical for all cross-section units of the panel. $\gamma_i^{(k)}$ denotes the autoregressive parameters, and $\beta_i^{(k)}$ are the regression coefficients' slopes; both parameters differing across countries. By definition, *x* cause *y* if and only if the past values of the variable *x* observed on the i^{th} country improve the forecasts of the variable *y* for this country *i* only.

To test the causality relationship, the null hypothesis of homogeneous non-causality (HNC), i.e., there is no causal relationship from *x*to *y* for all the countries of the panel $(\beta_i = (\beta^{(i)} \ldots \beta^{(k)})' = 0, \forall = 1 \ldots N)$ in Equation 2. Under the alternative hypothesis, there exists a causal relationship from *x*to *y* for at least one country of the sample[7]. The test statistic is given by the cross-sectional average of individual Wald statistics defined for the Granger non-causality hypothesis for each country (W_{HNC}) and converges to a chi-squared distribution with *K*degrees of freedom. They show that the standardized version of this statistic, appropriately weighted in unbalanced panels, follows a standard normal distribution and it is represented by (Z_{HNC}). For more details, the reader can refer to Dumitrescu and Hurlin (2012).

Data

The data series are sourced from World Development Indicators, issued and updated periodically by World Bank (2017c). The data series of six SAARC countries employed in the study, covering a 16-year period (2000-2015) are given in Appendix A.

RESULTS AND INTERPRETATIONS

The results of panel unit root which would be made available upon request show that the series of the variables RGDPC, INV, REM, PSC, REMPSC and MOBILE are of an *I(1)* process and the pooled data are stationary in their first differences. From the panel cointegration results in Table 7, we find strong evidence to reject the null hypothesis of no cointegration since five out of the seven statistics provided by Pedroni (1999, 2001, and 2004) confirm cointegration. Similarly, we reject the null hypothesis of no cointegration using the ADF-type statistics from Kao panel cointegration tests (1999) suggesting that that the six-dimension model is in fact cointegrated (see Panel B). Rejection of the null hypothesis of no cointegration between the *I(1)* series in the panel implies that thesesix variables do not drift apart in the long run steady state relationship. Despite the disparities among the six countries the Indian subcontinent, we found that RGDPC, INV, REM, PSC, REMPSC and MOBILE are cointegrated in the multi-country panel setting.

Table 7: Heterogeneous Panel Cointegration Results

Model: RGDP, INV REM PSC REMPSC, MOBILE	
A: PedroniCointegration test	
Panel cointegration statistics (within-dimension)	
Panel v-statistic	7.665(0.000)
Panel PP type ρ-statistic	2.954 (0.998)
Panel PP type *t*-statistic	-6.555(0.000)
Panel ADF type *t*-statistic	-2.122(0.016)
Group mean panel cointegration statistics (between-dimension)	
Group PP type ρ-statistic	3.701(0.999)
Group PP type *t* –statistic	-13.618(0.000)
Group ADF type *t*- statistic	-4.409(0.000)
B: Kao Residual Cointegration test	
ADF	-2.519 (0.005)

Notes: The number of lag truncations used in the calculation of the seven Pedroniand Kao ADF is 1. Probability values are in parenthesis.

The long run estimates for each of the six countries and the panel based on Pedroni's group mean FMOLS estimator are reported in Table 8.

Taking up the individual countries, the results reveal:

(i) signs of the coefficients of variables are in accordance with the theoretical expectations; Further, they are also found statistically significant except for INV in the case of Pakistan;

(ii) magnitudes of values of the long run coefficients of INV range from 8.793(Pakistan) to 115.420 (India) for INV.

(iii) the signs of REM are positive; and significant. The magnitudes of the values of the long run coefficients range from 8.363 (India) to 137.580 (Pakistan);

(iv) signs of PSC are positive and significant; the magnitudes of values range from 7.107 (Nepal) to 31.982 (Pakistan).

(v) signs of MOBILE are positive and significant. The magnitudes of the values of the coefficients range from 2.05 (Nepal) to 11.56 (Sri Lanka).

(vi) signs of interaction term REMPSC (remittances and bank credit to private sector are negative and significant, indicating they remittances and bank credit to private sector act as substitutes for each other.

The panel cointegration equation with RGDPC as dependent variable and INV, REM, PSC and MOBILE and interaction term as explanatory variables, covering all six SAARC countries is given as follows:

$$RGDPC = 1.539\,IN + 2.177\,REM + 11.148\,PSC - 0.584\,REMPSC + 8.995\,MOBILE$$

All the explanatory variables, except the interaction term have emerged with positive signs. They are also statistically significant. The results confirm the hypotheses that INV, REM, PSC and MOBILE are directly associated with RGDPC. It is evident with the emergence of the negative sign for interaction term REMPSC, remittances and bank credit to private sector in the Indian sub-continent context are not complements to each other; but they are substitutes for each other.

Table 8: Fully Modified OLS Estimates

Countries	INV	REM	PSC	REMPSC	MOBILE
Bangladesh	9.162 (4.095)*	36.431 (5.839)*	11.358 (5.517)*	-1.208(-6.139)*	3.965(19.515)*
Bhutan	11.659 (2.660)*	35.914 (5.847)*	11.448 (5.586)*	-1.198(-6.209)*	3.816(12.112)*
India	115.420 (23.190)*	8.363(5.563)*	17.818 (13.970)*	-3.066(-23.254)*	4.647 (22.510)*
Nepal	11.645(7.199)*	12.942(11.021)*	7.107(9.059)*	-0.330(-8.293)*	2.054(7.157)*
Pakistan	8.793 (1.924)	137.580(14.271)*	31.982(8.773)*	-5.886(-9.375)*	2.668(12.515)*
Sri Lanka	25.114(3.460)*	114.248(6.641)*	18.030(3.156)*	-4.050(-3.997)*	11.561(4.185)*
Panel Group	1.539(19.013)*	2.177(24.479)*	11.148(278.164)*	-0.584(-7.685)*	8.995(316.980)*

Notes: The values in parentheses are t-statistics. Asterisk (*) shows significance at 5 percent level.

In Table 9, we report two statistics relating to causality tests namely the average Wald statistic (W_{HNC}) and the standardized statistic (Z_{HNC}) based on the asymptotic moments. In order to assess the sensitivity of our results to the choice of the common lag-order, we report these two statistics for one and two lags. The empirical results can be summarised as follows.

(i) There is a significant causal relationship running from INV and REM to RGDPC.
(ii) We observe that RGDPC does Granger-cause PSC, REMPSC, REM and MOBILE.
(iii) MOBILE does Granger cause INV while PSC Granger causes MOBILE.
(iv) Bi-directional causality is detected, running from REM↮RGDPC, REMPSC↔ REM and the combination of PSC ↔ REM. The past values of these variables mutually have been reinforcing each other. These causality directions were actively detected among these variables.
(v) Indirect causality is also indicated (Figure 1) among these pairs of variables. Two prominent sets of indirect causality worth mentioning: one is first running PSC → MOBILE → INV → RGDPC → REMPSC and ultimately back to PSC. Secondly, indirect causality running from RGDPC →MOBILE → INV →RGDPC → REM → RGDPC.

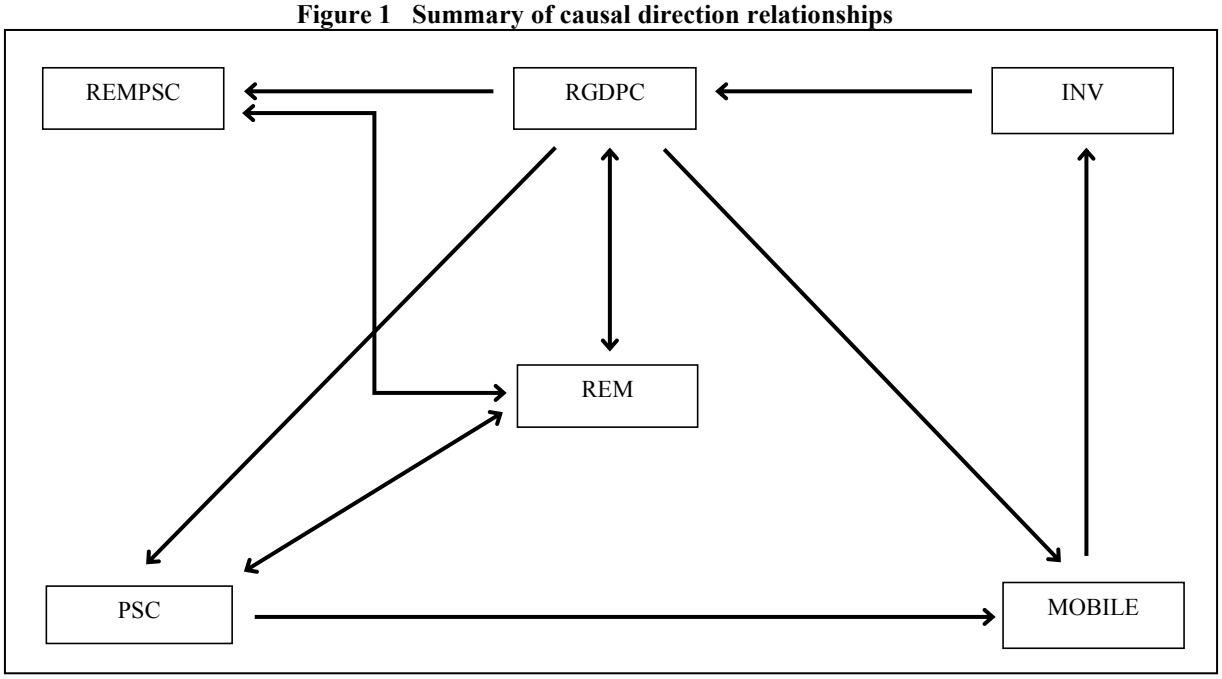
Table 9: Dumitrescu and Hurlin Panel Granger-Causality Tests

Direction of Causality	Lag	W^{HNC}	Z^{HNC}	Probability
INV→RGDP	1	6.457*	2.759*	0.005
	2	3.910*	2.450*	0.014
RGDP→INV	1	3.615	0.741	0.458
	2	2.753	1.912	0.056
REM→RGDP	1	7.752*	3.678*	0.000
	2	4.156*	3.639*	0.000
RGDP→ REM	1	8.906*	4.497*	0.000
	2	11.427*	12.589*	0.000
PSC→RGDP	1	4.156	1.125	0.260
	2	1.746	0.672	0.501
RGDP→PSC	1	7.126*	3.234*	0.001
	2	3.012*	2.231*	0.025
REMPSC→RGDP	1	2.214	-0.253	0.799
	2	0.264	-1.152	0.249
RGDP→ REMPSC	1	5.481*	2.066*	0.038
	2	4.795*	4.426*	0.000
MOBILE→ RGDP	1	2.978	0.288	0.772
	2	2.225	1.262	0.206
RGDP→MOBILE	1	8.659*	4.322*	0.000
	2	2.934*	2.135*	0.032
REM→INV	1	3.365	0.563	0.572
	2	2.350	1.141	0.156
INV→REM	1	3.087	0.366	0.713
	2	0.591	-0.749	0.453
PSC→INV	1	3.637	0.756	0.449
	2	2.154	1.174	0.240
INV→PSC	1	4.970	1.703	0.088
	2	2.780	1.945	0.052
REMPSC→INV	1	2.488	-0.058	0.953
	2	0.730	-0.577	0.563
INV→REMPSC	1	3.836	0.898	0.369
	2	2.315	1.373	0.169
MOBILE→INV	1	8.567*	4.257*	0.000
	2	3.475*	2.800*	0.005
INV→MOBILE	1	4.996	1.722	0.085
	2	2.034	1.027	0.304
PSC→REM	1	10.352*	5.524*	0.000
	2	5.348*	5.106*	0.000
REM→PSC	1	9.142*	4.665*	0.000
	2	4.513*	4.078*	0.000
REMPSC→REM	1	5.461*	2.052	0.041
	2	6.374*	6.369*	0.000
REM→ REMPSC	1	9.046*	4.597*	0.000
	2	4.803*	4.436*	0.000
MOBILE→REM	1	13.191*	7.540*	0.000
	2	9.046*	9.658*	0.000
REM→MOBILE	1	5.453*	2.046*	0.041
	2	4.594*	4.178*	0.00
REMPSC→PSC	1	8.049*	3.889*	0.000
	2	9.723*	10.491*	0.000
PSC→ REMPSC	1	10.344*	5.519*	0.000
	2	11.383*	2.453*	0.000
MOBILE→PSC	1	5.056	1.764	0.077
	2	1.977	0.956	0.338
PSC→ MOBILE	1	6.596*	2.857*	0.004
	2	12.818*	2.964*	0.000

MOBILE→REM	1	8.154*	3.964*	0.000
	2	11.164*	2.374*	0.000
REM→MOBILE	1	13.792*	7.967*	0.000
	2	10.067*	1.984*	0.041

Notes: Null hypothesis is no causality. Estimations are based on the pooled data for 2000-2015 and 6Indian subcontinent (N=6, T=16). Asterisk (*) shows significance at 5 percent level.

Figure 1 Summary of causal direction relationships



Note: RGDPC→REMPSC imply one-way causality while RGDP↔REM indicates bi-directional causality relationship.

CONCLUSIONS WITH POLICY IMPLICATIONS

This paper undertook a panel study of the nexus between inward remittances (REM) and growth in GDP per capita (RGDPC) in the six countries in the Indian sub-continent. Two of the six countries figures are amongst the prominent recipients of remittances in recent years. In 2016, while India has been the first among the ten top most receivers of remittances in absolute terms in 2016 with $62.7 billion, Nepal is the second top most recipient of remittances in terms of percentage of GDP at 29.7 %. The objective of the study is to assess the role of financial sector development supported by information communication technology (ICT) for promoting financial inclusion.

The study findings confirm that remittances have been a positive and significant contributor to growth in RGDPC. The financial sector, represented by the variable bank credit to private sector (PSC) and ICT which are proxied by the variable, namely the number of mobile phones per 100 people, have also been observed to be directly associated with RGDPC. However, the negative sign of the interaction term (REMPSC), suggests that REM and PSC act as substitutes, rather than complements. The policy implications are that the efforts undertaken by the six countries have to step up development of financial sector further more by promoting the spread of branchless banking through ICT.

Notes and Sources

[1]According to World Bank's latest update (World Bank, 2017) the decline by 2 percent is the first drop in global remittances since 2009, which witnessed the onset of American financial crisis, soon deteriorating into global recession. The decline in remittances in 2015 was attributed to lay-offs by the oil companies in the Gulf countries due to the continuing fall in oil prices since 2013. However, World Bank (2016a) reports that with the advanced economies recovering from recession and shortages of labour developing in skilled areas as well as unskilled farm labour, the rising trend in global migration is not likely to be reversed.

[2] These six countries, being members of a formal regional organization, known as South Asian Association of Regional Cooperation (SAARC) are also collectively referred to SAARC countries.

[3] The World Bank (2016a) introduced a new definition of remittances in April 2016. Remittances are categorized into three: (i) personal transfers; (ii) employees' compensation less taxes, social contributions, transports and travel; and (iii) capital transfers between households.

[4] Mashayeki (2014) notes that financial inclusion is an important element of the UN post-2015 Sustainable Development Goals: (i) contribution to poverty reduction and economic development (target 1.4); (ii) recognition of role of agriculture (target 2.3); (ii) general support to economic growth and job creation and innovation(target 8.3); (iii) stepping up infrastructure (9.3); (iv) promotion of inclusiveness of the poor and vulnerable (target 1.4); (vi) encompassing women(target 5a); (vii) formalization and growth of micro and small and medium enterprises (8.3); and (viii) enhancement of importance of financial institutions (target 8.10)

[5] Baltagi and Kao (2000) and Chiang and Kao (2001) provide excellent and comprehensive survey for studying nonstationary panel data.

[6] Dumitrescu and Hurlin (2012) allow for two subgroups of cross-section units: the first one is characterized by causal relationships from x to y, but it does not necessarily rely on the same regression model, whereas there is no causal relationships from x to y in the case of the second subgroup. Further, they consider a heterogenous panel data model with fixed coeffcients (in time). The dynamics of the variables may be thus heterogeneous across the cross-section units, regardless of the existence (or not) of causal relationships.

[7] For example, x= INV and y= RGDPC following the empirical model of Equation 1. In this scenario, if the null of HNC is rejected then INV Granger causes RGDPC at least in one country of the PICs.

REFERENCES

Adleman, I. and Taylor, J.E. (1990). "Is Structural adjustment with a human face possible? The Case of Mexico", Journal *of Development Studies*, 26: 387-407

Asteriou, D. and Hall, S.G. (2016) *Applied Econometrics*, Third Edition, Palgrave.

Aggarwall, R, Demirguv-Kant, A, MartinezPeria, M.S. (2011). "Do Remittances Promote Financial Development", *Journal of Development Studies*, 96(2) : 255-264.

Baltagi, B.H. (2013) *Econometric Analysis of Panel Data*, 5th Edition, John Wiley & Sons Ltd.

Baltagi, B.H. and C. Kao (2000) 'Nonstationary Panels, Cointegration in Panels and Dynamic Panels: A Survey', in Baltagi, B.H., T B. Fomby and R.C. Hill, (ed.) *Advances in Econometrics volume 15: Nonstationary Panels, Cointegration in Panels and Dynamic Panels*:7 – 51. Greenwich, CT: JAI Press.

Barajas, A. Gapen, M.T. Chami, R., Montiel,P. and Fullenkamp, C.(2009). "Do workers' Remittances Promote Economic Growth?", *IMF Working Paper, 09/153,* Washington, D.C.: International Monetary Fund.

Bettin, G. and Zazzaro.A (2012). "Remittances and Financial Development: Substitutes or Complements in Economic Growth?", *Bulletin of Economic Research,* 64(4): 509-536

Calderon, C., Fajnzylber, P. and Lopez, J.H. (2008). "Remittances and Growth: The Role of Complemenatary Policies" in Fajnzylber, P. and Lopez, J.H. (eds). *Remittances and Development: Lessons from Latin America,* Washington, D.C.: World Bank.

Chami, R. and C. Fullenkamp, C. (2013). "Beyond the Household", *Finance and Development,* September 2013: 48-51.

Chiang, M.H. and Kao. C. (2001) *Nonstationary panel time series using NPT 1.2* – A user guide (Center for Policy Research, Syracuse University).

Dumitrescu, E-I., Hurlin, C. (2012) 'Testing for Granger non-causality in heterogeneous panels'*Economic Modellin*g, 29(4): 1450-1460.

Edwards, A.C. and Ureta, M. (2003). "International Migration, Remittances and Schooling: Evidence from Salvadore', *Journal of Development Economics",* 51: 387-411

Freund, C. and Sapatfora**, N. (**2008). "Remittances, Transaction Cost, and Informality", *Journal of Development Economic*s, 86(2):356-366

Giuliano. P. and Ruiz-Arranz. M. (2009). "Remittances, Financial Development and Growth", *Journal of Development Economics, 90 (1):144-52.*

Granger, C. W. J. (1969) 'Investigating causal relations by econometric models and crossspectral methods' *Econometrica*, 37(3): 424-438.

Government of India (2009). " A Hundred Small Steps: Report of the Committee on Financial Sector Reforms", New Dehi: Planning Commission.

Hadri, K. (2000) 'Testing for stationarity in heterogeneous panel data' *Econometrics Journal,* 3(2): 148-161. DOI: 10.1111.1368-423X.00043

Hildebrandt, N. and McKenzie, D.J. (2005). "The Effects of Migration on Child Health in Mexico", *Policy Research Working Paper Series 3573*, Washington, D.C.: World Bank.

Holtz-Eakin, D., Newey, W., Rosen, H. S. (1988) 'Estimating vector autoregressions with panel data' *Econometrica*, 56(6): 1371 – 1395.

Holtz-Eakin, D., Newey, W., Rosen, H. S. (1989) 'The revenues-expenditure nexus: evidence from local government data'*International Economic Review*, 30(2), 415 – 429. DOI: 10.2307/2526655

Im, K. S., Pesaran, M. H., Shin, Y. (2003) 'Testing for unit roots in heterogeneous panels' *Journal of Econometrics*, 115(1): 53-74.

Jayaraman, T.K., Choong, C.K. and Chand, P. (2016). "Do Remittances and aid affect export competitiveness of Fiji?" Journal of Economic Development, 41(2): 111 – 125.

Kao, C. (1999) 'Spurious regression and residual-based tests for cointegration in panel data' *Journal of Econometrics*, 90(1): 1-44.

Leon-Ledesma, M.andPiracha, M. (2001), "International Migration and the role of Remittances in Eastern Europe", *Studies in Economics 0113*, Department of Economics, University of Kent.

Levin, A., Lin C-F., Chu, J. C-S. (2002) 'Unit root tests in panel data: asymptotic and finite sample properties' *Journal of Econometrics,* 108(1): 1-24.

Maddala, G. S., Wu, S. (1999) 'A comparative study of unit root tests with panel data and a new simple test' *Oxford Bulletin of Economics and Statistics,* 61: 631-652.

Mashayekhi, M. (2014). "Remittances and Financial Inclusion", *Paper presented at the 13th Coordination Meeting on International Migration, New York 12-13 February 2015*, Geneva: UNCTAD

Nyamongo, N., Misati, R. N., L. Kipyegon, L. and Ndirangu, L. (2012). "Remittances, Financial Development, and Economic Growth in Africa", *Journal of Economics and Business*, 64:24-260

Page J. and Adams, R.H. Jr. (2003). "International Migration, Remittances and Poverty in Developing Countries", *World Bank Policy Research Working Paper No.3179,* Washington, D.C: World Bank

Paulson A. and Townsend, R. (2000). "Entrepreneurship and Financial Constraints in Thailand", *Working Paper*, (Evanston/Chicago, Illinois: Northwestern University).

Pedroni, P. (1999) 'Critical values for cointegration tests in heterogeneous panels with multiple regressors' *Oxford Bulletin of Economics and Statistics*, 61(1): 653-670.

Pedroni, P. (2000) 'Fully modified OLS for heterogeneous cointegrated panels' *Advances in Econometrics,* 15: 93-130.

Pedroni, P. (2001) 'Purchasing power parity tests in cointegrated panels' *The Review of Economics and Statistics,* 83(4): 727 – 731.

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(3): 597 – 625. DOI: http://dx.doi.org/10.1017/S0266466604203073

Ramirez, M.D. and Sharma, H. (2008). "Remittances and Growth in Latin America: A panel Unit Root and Panel Cointegration Analysis", Working *Papers, No. 51,* New Haven: Yale University Press.

Stahl, C. W. and Habib**,** A (1989). "The impact of Overseas Workers 'remittances on indigenous industries: Evidence from Bangladesh", *The Developing Economies*, 27:269-85

United Nations (2015) *Millennium Development Goals and post-2015 Development Agenda***,** http://www.un.org/en/ecosoc/about/mdg.shtml/post2015developmentframework.shtml, Accessed on August 25, 2016.

World Bank (2006). *At Home and Away: Expanding Job Opportunities for Pacific Islanders through Labor Mobility, Sydney* and Washington, D.C.: World Bank.

World Bank (2011). *Migration and Remittances*: Fact Book 2010, Washington, D.C.: World Bank

World Bank (2016a). *Word Development Indicators*, Washington, D.C: World Bank.

http://databank.worldbank.org/data/views/variableselection/selectvariables.aspx?source=world-development-indicators , Accessed on June 23, 2016.

World Bank (2016b). "Migration and Remittances: Recent Developments and Outlook, April 2016", *Migration Development Brief 26*, Washington, D.C.: World Bank

World Bank (2016c). *Pacific Possible: the billion dollar prize,* Washington D.C.: The World Bank.

World Bank (2017). Migration and Remittances: recent Developments and Outlook, http://www.worldbank.org/en/topic/migrationremittancesdiasporaissues, accessed on June 20 2017.

Yang, D. (2008). "International Migration, Remittances and Household Investment: Evidence from Philippines", *Economic Journal*, 118 (528): 591-630

Zouhheir, A. and Sghaier, I. (2014). " Remittances, Financail Development and Econmic Frowth: The Case of North African Countries", The Romanian Economic Journal, XVII, No.51: 137-170

Appendix

Table A1. Variables Employed in the Study: Bangladesh

Year	RGDP per cap (Const US$)	Investment (% of GDP)	REM (% of GDP)	Bank Credit to Pvt Sector (% of GDP)	Mobile per 100 People
	RGDPC	INV	REM	PSC	Mobile
2000	510.46	23.81	3.69	21.49	0.21
2001	526.37	24.17	3.90	23.86	0.39
2002	536.71	24.34	5.22	25.86	0.78
2003	552.53	24.68	5.31	25.69	0.98
2004	572.21	24.99	5.50	27.56	1.97
2005	600.72	25.83	6.69	29.03	6.29
2006	632.35	26.14	7.56	30.88	13.21
2007	668.89	26.18	8.24	31.79	23.47
2008	701.17	26.20	9.76	33.82	30.17
2009	728.42	26.21	10.27	35.99	34.35
2010	760.33	26.25	9.41	40.77	44.95
2011	800.04	27.42	9.38	42.26	55.19
2012	842.05	28.26	10.59	42.78	62.82
2013	881.90	28.39	9.25	41.58	74.43
2014	924.06	28.58	8.67	43.26	80.04
2015	972.88	28.89	7.89	43.73	81.90

Table A2. Variables Employed in the Study: Bhutan

Year	RGDP per cap (Const US$)	Inv (% of GDP)	REM (% of GDP)	Bank Credit to Pvt Sector (% of GDP)	Mobile per 100 People
	RGDPC	INV	REM	PSC	Mobile
2000	1220.75	49.99	0.00	8.85	0.00
2001	1283.15	59.46	0.00	9.77	0.00
2002	1378.93	60.54	0.00	11.10	0.00
2003	1441.14	58.35	0.00	12.98	0.37
2004	1483.38	63.05	0.00	15.81	3.02
2005	1547.73	49.93	0.00	18.07	5.53
2006	1614.67	46.16	0.25	21.39	12.33
2007	1863.45	39.50	0.25	23.40	22.00
2008	1914.33	41.79	0.28	29.93	36.61
2009	2004.73	46.18	0.38	32.39	48.11
2010	2201.29	61.19	0.52	41.42	55.00
2011	2336.07	68.02	0.57	46.79	66.38
2012	2416.71	67.98	0.99	45.70	75.61
2013	2432.75	46.44	0.66	45.62	72.20
2014	2537.65	53.54	0.73	43.80	81.58
2015	2668.12	54.26	0.96	45.18	87.03

Table A3. Variables Employed in the Study: India

Year	RGDP per capita (Const US$)	Investment (% of GDP)	REM (% of GDP)	Bank Credit to Pvt Sector (% of GDP)	Mobile per 100 People
	RGDPC	INV	REM	PSC	Mobile
2000	770.35	22.74	2.70	27.85	0.34
2001	793.64	25.05	2.89	28.13	0.62
2002	810.00	23.70	3.00	31.75	1.21
2003	859.34	24.55	3.40	31.08	3.08
2004	912.56	28.72	2.60	35.57	4.70
2005	981.69	30.33	2.65	39.40	8.00
2006	1056.24	31.29	2.99	43.22	14.52
2007	1130.05	35.57	3.10	46.22	20.16
2008	1156.97	34.95	4.21	50.06	29.53
2009	1237.39	34.29	3.72	48.78	44.12
2010	1345.72	33.41	3.23	51.14	62.39
2011	1416.12	34.31	3.43	51.29	73.20
2012	1474.69	33.38	3.76	51.87	69.92
2013	1551.61	31.25	3.77	52.37	70.78
2014	1642.73	30.26	3.46	52.02	74.48
2015	1751.75	29.17	3.30	52.23	78.06

Table A4. Variables Employed in the Study: Nepal

Year	RGDP per capita (Const US$)	Investment (% of GDP)	REM (% of GDP)	Bank Credit to Pvt Sector (% of GDP)	Mobile per 100 People
	RGDPC	INV	REM	PSC	Mobile
2000	459.13	19.32	2.03	30.28	0.04
2001	473.18	19.20	2.45	29.08	0.07
2002	466.48	19.56	11.21	22.51	0.09
2003	478.02	19.92	12.18	25.81	0.33
2004	493.87	20.34	11.31	26.55	0.47
2005	504.87	19.94	14.91	28.21	0.90
2006	516.04	20.72	16.07	32.61	4.51
2007	528.13	21.07	16.79	36.77	12.60
2008	554.80	21.88	21.74	51.20	16.00
2009	574.12	21.35	23.21	58.77	21.09
2010	595.43	22.21	21.65	54.21	34.25
2011	608.93	21.41	22.37	52.50	49.18
2012	630.59	20.77	24.96	55.71	60.45
2013	648.74	22.59	28.82	57.71	76.85
2014	679.30	23.52	29.72	61.62	81.87
2015	689.51	27.75	31.75	64.79	96.75

Table A5. Variables Employed in the Study: Pakistan

Year	RGDP per capita (Const US$)	Investment (% of GDP)	REM (% of GDP)	Bank Credit to Pvt Sector (% of GDP)	Mobile per 100 People
	RGDPC	INV	REM	PSC	Mobile
2000	850.31	15.88	1.45	22.34	0.21
2001	848.56	15.66	2.02	21.78	0.51
2002	857.77	15.28	4.92	21.67	1.13
2003	881.14	15.10	4.76	24.60	1.58
2004	927.07	14.98	4.03	28.74	3.24
2005	978.05	17.46	3.91	28.65	8.08
2006	1017.46	17.73	3.73	26.76	21.45
2007	1044.97	17.19	3.94	27.74	38.34
2008	1041.06	17.61	4.14	28.60	52.70

2009	1048.53	15.95	5.18	22.62	55.46
2010	1043.30	14.20	5.46	21.29	57.28
2011	1049.59	12.52	5.74	18.03	61.81
2012	1063.61	13.48	6.24	16.84	67.06
2013	1087.08	13.36	6.33	16.37	70.13
2014	1114.21	13.04	7.06	15.80	73.33
2015	1142.75	13.88	7.12	15.30	66.92

Table A6. Variables Employed in the Study: Sri Lanka

Year	RGDP per capita (Const US$)	Investment (% of GDP)	REM (% of GDP)	Bank Credit to Pvt Sector (% of GDP)	Mobile per 100 people
	RGDPC	INV	REM	PSC	Mobile
2000	1837.14	28.04	7.07	28.82	2.28
2001	1795.08	22.00	7.43	30.71	3.51
2002	1852.26	20.07	7.84	31.00	4.84
2003	1947.48	20.04	7.54	30.71	7.14
2004	2038.04	22.64	7.62	32.35	11.20
2005	2149.04	23.37	8.09	33.05	16.85
2006	2296.41	24.87	7.66	34.64	26.88
2007	2434.04	24.72	7.75	34.23	39.32
2008	2559.47	25.29	7.18	29.53	54.19
2009	2630.01	23.73	7.93	25.71	79.15
2010	2819.51	24.46	7.27	25.44	83.62
2011	3033.56	28.24	7.89	34.91	87.55
2012	3286.01	29.89	8.77	34.92	91.63
2013	3371.18	30.07	8.64	34.64	95.50
2014	3503.99	27.31	8.79	35.45	103.16
2015	3637.54	26.52	8.50	40.62	110.59