

Drivers of International Remittance Flows: Role of Risk and Age Dependency Variables¹

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Abstract:

This paper aims to analyze the impact of macroeconomic determinants of remittance inflows using cross-country panel data for 40 countries from 1990-2016. The analysis is further extended by studying macroeconomic determinants of bilateral remittance inflows for South Asian countries namely, India, Bangladesh, Pakistan and Sri Lanka from 27 host countries over 2010 to 2016. The macroeconomic determinants are extended through the inclusion of demographic (age structure) and risk variables. Employing Two Staged Least Squares (TSLS) technique, the results emphasize on the role of altruistic motive for sending remittances as income levels in host and home country have significant impact on remittance inflows. Age structure impact captured through the inclusion of young and old dependency ratios highlight that presence of young dependent population in home country increases remittances, providing strong empirical support for the role of age structure transition. Supplementary analysis focusing on select South Asian countries (Bangladesh, India, Pakistan and Sri Lanka) using gravity model framework further underline the role of altruism by providing empirical evidence that remittances rise in the aftermath of natural calamities and disasters. Further, remittances reduce upon migration to high skilled countries experiencing lower age dependency ratios and during greater political stability in host country.

JEL classification: F24, J11, J61

Keywords: Remittance inflows; Macroeconomic determinants; Cross-country panel; South Asia

¹ This paper is based on the author's doctoral dissertation, under ISCCR Research Fellowship Scheme, at the Institute for Social and Economic Change (Bengaluru, India). The author is grateful to her PhD supervisor, Prof M R Narayana, for his guidance throughout the preparation of this paper. Thanks are due to members of the Doctoral Committee and Bi-Annual Panel members at ISEC for their suggestions on earlier versions of this paper. However, the usual disclaimers apply.

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Macroeconomic Determinants of Remittances: A Cross-Country Analysis

1. Introduction

High volatility observed in foreign private capital flows, exacerbated by GFC of 2008-09 have led to the emergence of remittances as a stable source of external financial inflows for many developing economies. Studies on remittances have garnered importance due to the sheer volume of funds transferred from source to destination countries. Much of this flows from developed and industrialized nations to developing and emerging ones. The total remittance inflows during 2015 were estimated at US\$ 601 billion, of which US\$ 440 billion (73 per cent of total remittance inflows) was directed towards developing countries. Remittance inflows were three times more than official aid, higher than foreign direct investment inflows (not considering China) and almost on par with other debt and equity investments (foreign portfolio investments) (World Bank, 2016). As of 2017, remittances to developing countries reached a staggering US\$ 466 billion from US\$ 426 billion in 2016. The highest remittance receiving country was India (US\$ 69 billion), followed by China (US\$ 64 billion), Philippines (US\$ 33 billion) and Mexico (US\$ 31 billion), (World Bank, 2018). The top three regions include East Asia & Pacific (EAP) which received highest remittance inflows (US\$ 130 billion), followed by South Asia region (SAR) (US\$ 117 billion) and Latin America & Caribbean (LAC) (US\$ 80 billion) for 2017. It is interesting to note that while both EAP and LAC regions have 24 developing countries each, SAR has 8 countries characterized by high density of population experiencing a transition in its age structure.

Other reasons for its growing importance include the nature of remittances, as they are observed to be a stable source of external funds (Ratha, 2003). Unlike other external flows which are influenced by interest rates, growth prospects and financial stability in the recipient country, remittances have increased steadily resilient to global economic disturbances. Given this nature, remittances positively contribute to output (IMF, 2005; Chami et al., 2008), reduce poverty (Yoshino, et al. 2017), improve financial sector and reduce credit constraints on domestic investments (Aggarwal et al., 2011; Guiliano & Ruiz-Arranz, 2009). Apart from contributing to domestic sector, remittances influence external sector through impact on exchange rates by appreciation of real exchange rate and the subsequent impact on cost competitiveness detrimental to the trade balance of developing countries (Dutch-disease) (Amuedo-Dorantes & Pozo, 2004, Acosta et al., 2009, Ratha, 2013; Guha, 2013). Remittances also contribute positively towards current account under the Balance of Payments by reducing the probability of current account reversals (Buch & Kuckulenz, 2010) and by ensuring long run sustainability of current account (Hassan & Holmes, 2016).

Given the macroeconomic impact of remittances, understanding the drivers of remittances may provide key insights to design appropriate policies and strategies to better mobilize and utilize these unrequited flows into the economy. This paper examines the macroeconomic determinants including demographic and risk factors of remittances, and the analysis is divided into two parts. First part estimates the determinants of remittance inflows which includes economic, demographic and risk-related variables, in a cross-country panel framework. In the second part macroeconomic determinants (inclusive of demographic and risk-related variables) are estimated for South Asian countries (Bangladesh, India, Pakistan and Sri Lanka) using gravity model framework. Following which, a comparison between the nature and impact of determinants that stimulate remittances across cross-country panel model and South Asia region model is undertaken. The paper contributes to the existing literature on two fronts. First, by extending the determinants to include demographic factors such as skill and age structure variables, and risk related variables on natural disasters and political risk for remittances in a cross-country panel framework and second, by analyzing these aforementioned determinants on remittance inflows to South Asian region by using bilateral remittances data and employing gravity model approach.

The policy changes in the developed world with respect to increasing anti-immigration sentiments leading to tightening of immigration policies by US, and European countries is seen as a major challenge for migrants. Also labour market adjustment and preference for local labour in Gulf Cooperation Council (GCC) countries is seen as new threat for aspiring South Asian emigrants to these countries. Given the fact that nearly 50 per cent of the migrants from South Asia migrate towards GCC countries and 25 per cent towards North America and Europe, the rising risk in these countries may pose significant impact on remittances. The analysis in the paper is an extension of the work by McCracken et al. (2017) in the context of Latin American and Caribbean countries by the inclusion of political risk in the host/source country and cost to remit variable. Apart from capturing the risk in the home country under cross-country analysis, this paper attempts to analyse the impact of growing political risk in the host countries under gravity model analysis for South Asian countries.

Thus, the main research questions which this paper attempts to answer are one, what are the key macroeconomic determinants that influence the flow of remittances on a global scale; two, whether age structure variables and risk related variables have significant impact especially for South Asian countries; three, do the macroeconomic determinants have similar impact across cross-country analysis and South Asia region analysis. Rest of the paper is structured as follows. Section 2 presents some basic data followed by review of related literature in Section 3. Section 4 discusses the methodology, variables and data sources. Empirical results are analysed in section 5 and Section 6 concludes the paper.

2. Trends in Remittance Flows

This section explores the magnitude and growth of remittance flows across the developing world. Table 1 presents total remittance flows grouped by region and income from 2010 to 2017. Among developing regions, East Asia and Pacific (EAP) had the highest share of remittance flows. About 28 per cent of total flows to developing countries were routed to EAP, with China, Philippines and Vietnam being the highest beneficiaries. South Asia Region (SAR) accounted for 25 per cent of total remittances to the developing world with India receiving highest remittances, Pakistan and Bangladesh also rank among top ten recipient countries in the world. India, Pakistan, Bangladesh and Sri Lanka together received 94 per cent of remittances directed towards South Asia (or US\$ 109 billion) in 2017. Most of the regions showed a decline during 2015-2016 due to sluggish economic activity in the developed world. The upswing in 2017 in remittances for all regions across the board is due to economic recovery and higher investments in North America and Europe. Simultaneous increase in oil prices which increased demand for labour and subsequently wages in Gulf nations is considered as another factor for reversing the decline of -0.9 per cent in 2015 and -2.5 per cent in 2016 to a considerable growth of 8.6 per cent for the developing countries.

Table 1. Remittances Inflows to Developing Countries, 2010-2017

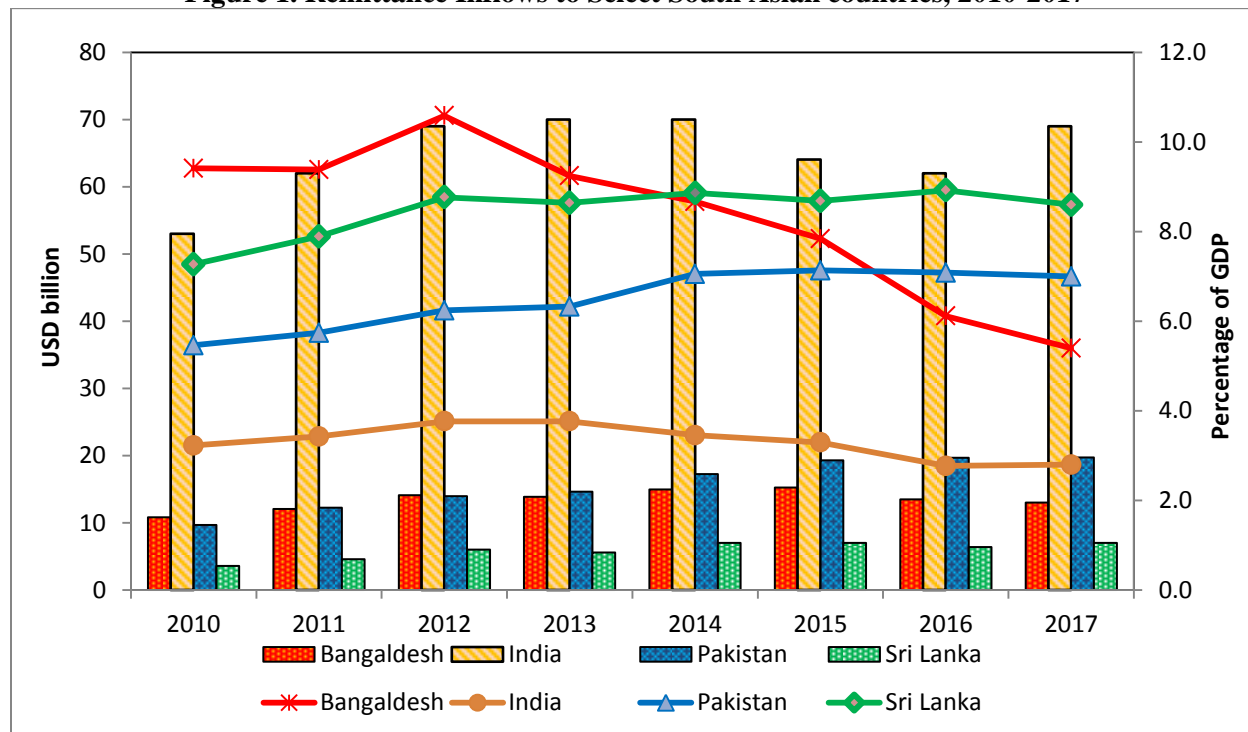
	(In USD billion)							
Regions	2010	2011	2012	2013	2014	2015	2016	2017
Developing countries	333	373	392	404	444	440	429	466
East Asia and Pacific	95	107	107	112	121	126	123	130
Europe and Central Asia	32	38	39	43	52	41	40	48
Latin America and Caribbean	56	59	60	61	65	68	74	80
Middle East and North Africa	40	42	47	46	54	51	49	53
Sub-Saharan Africa	29	31	31	32	37	36	34	38
South Asia	82	96	108	111	116	118	110	117
	Growth Rate							
Developing countries	10.3	12.0	5.1	3.1	9.9	-0.9	-2.5	8.6
East Asia and Pacific	20.2	12.6	0.0	4.7	8.0	4.1	-2.4	5.7
Europe and Central Asia	-0.8	18.8	2.6	10.3	20.9	-21.2	-2.4	20.0
Latin America and Caribbean	1.1	5.4	1.7	1.7	6.6	4.6	8.8	8.1
Middle East and North Africa	18	5.0	11.9	-2.1	17.4	-5.6	-3.9	8.2
Sub-Saharan Africa	7	6.9	0.0	3.2	15.6	-2.7	-5.6	11.8
South Asia	9.4	17.1	12.5	2.8	4.5	1.7	-6.8	6.4

Source: *Migration and Remittances Factbook, World Bank (Various Issues)*.

Focusing on SAR, Figure 1 shows a stark difference between remittances received by India and other South Asian countries (Bangladesh, Pakistan and Sri Lanka). The second highest recipient was Pakistan which overtook Bangladesh in 2014, and as of 2017, Pakistan received about USD 20 billion as

remittance inflows. The remittances to Bangladesh were USD 15 billion during 2014 and 2015 and reduced to USD 13 billion for 2017, whereas Sri Lanka has maintained stable remittances of USD 6 to 7 billion since 2014. Comparing remittances as a share of GDP presents an interesting picture. Among the four select SAR countries, Sri Lanka had the highest share of remittances to GDP (9 per cent since 2014), followed by Pakistan with 7 per cent. The share of remittances against GDP for Bangladesh fell from a peak of 10 per cent in 2012 to 5.4 per cent in 2017. India also witnessed a decline after 2013, from 3.8 per cent it declined to 2.8 per cent in 2017. Though, India received highest amount of remittances in absolute terms since 2010, yet when compared as share of GDP, it stands last among select South Asian countries.

Figure 1. Remittance Inflows to Select South Asian countries, 2010-2017



Source: World Bank (2018).

Apart from having second highest share in remittance flows, SAR also has India, Pakistan and Bangladesh among top ten migrant origin countries. As of 2017, it is estimated that India has nearly 16.4 million migrants, followed by Bangladesh with 7.8 million and Pakistan with 6.1 million. Thus, study of determinants of remittances for SAR countries aims to light on the specific factors that could affect flow of remittances to these select countries which have the highest inflow of remittances and highest outflow of migrants in the world.

3. Review of Related Literature

The literature identifies two main motives to remit altruism (Lucas & Stark, 1985) and self-interest (Poirine, 1997; Ilahi & Jafarey, 1999). However, the understanding of various factor that determine

remittances has widened to include other determinants such as tempered altruism or enlightened self-interest (a mix of altruism and self-exchange); investment & risk factors and need for inheritance & informal contracts (based on the need to hedge against income and job losses, and consumption smoothing behaviour).

Other studies on remittances are extensions of the aforementioned studies. Hoddinott (1994) analyses the intended use of remittances which could be for risk-sharing (insurance) or smoothing inter-temporal path of consumption, saving and investment or to pay for overhead costs (payment in lieu of services offered by family in home country on behalf of remitter) in line with the implicit loan framework of Poirine (1997). Stark (1991), Agarwal & Horowitz (2002), Gubert (2002) and Yang & Choi (2007) find that family reduce their risk from income shocks by depending on remittances from migrant family members providing support to the risk-sharing motive propounded by Lucas & Stark (1985). Remittances can be directed for final consumption of goods and services, purchase of financial assets or real assets (including expenditure on human capital, e.g. education, health care etc.), see Brown (1994); Adams (1998); Cox-Edwards & Ureta (2003); Taylor et al. (2003) intensifying the argument of increasing assets be it fixed, financial, human or social proposed by Lucas & Stark (1985) for improved social and/or political standing of the migrants.

The remittances are determined by numerous motives, altruism, self-interest, investment and risk factors, need for inheritance and informal contracts, but identifying and discriminating between them is difficult in the absence of “detailed data on migrants and receiving households' characteristics and on the timing of remittances” (Docquier & Rapoport, 2006).

The motives to remit have been indirectly analysed under macroeconomic studies as well. Swamy (1981) found that altruism was a stronger motive to remit as GDP of host country, number of migrants and their incomes abroad had significant positive impact on remittance inflows into home country. Whereas, the self-interest motive captured by differences in interest rates, foreign currency exchange rates and real rate of return were insignificant. Chami, et al. (2003) supported the conclusions of Swamy (1981) highlighting the importance of the altruistic behaviour of remittances as they found that remittances increase upon increase in migrants' income and/or decrease in families' income in the home country. Vargas-Silva & Huang (2006) while analysing Mexico's remittance inflows from US found that decrease in unemployment rate; increase in money supply and low inflation for US economy positively impacted Mexican remittances, whereas inflation and economic growth of Mexico had no impact, assigning more support to host country factors. Whereas, El-Sakka & McNabb (1999) contradict Swamy (1981) and give importance to domestic policies by laying more emphasis to the black market premium and the domestic

and foreign interest rate differentials which could deter the flow of remittances. Unrealistic pegging of interest rates and exchange rates at home country led to either diversion of remittances to other investments abroad or made their way into home country through un-official channels. Thus, fluctuations in exchange rate impacted remittances, Chami et al. (2008) found that workers' remittances decrease in response to currency depreciations. This could depict compensatory behaviour of remitters as they smooth the relative purchasing power of the remittance in domestic currency in response to changing nominal exchange rates. The empirical evidence for appreciation of home country adversely affecting remittances has also been found in the case of Tonga by Lin (2011).

Interest rates have also been an important determinant of remittances in macroeconomic studies, Higgins, et al. (2004) and Lin (2011) suggested that interest rate uncertainty depicted increased risk in the home country, whereas Lianos (1997) found that while domestic interest rate had strong positive association with remittances (depicting opportunistic motive), foreign interest rate had no relation with remittances. While some studies mentioned above found evidence for interest rates having significant but small impact on remittances, larger body of literature remains in favour of limited role of rate of returns on remittances, thereby reinforcing the importance of altruism in macroeconomic studies (Swamy, 1981; Elbadawi & Rocha, 1992; Straubhaar, 1986; IMF, 2005; Lueth & Ruiz-Arranz, 2006).

Remittances are considered as counter-cyclical and do not respond to the economic fluctuations (Ratha, 2003; Ratha & Shaw, 2007; Chami, et al., 2008), whereas Sayan (2006) argues that counter-cyclicity or pro-cyclicity of remittances is not observed for the panel of 12 developing countries during 1973-2003. Lueth & Ruiz-Arranz (2006) find support for the importance of home country economic conditions in their gravity estimations based on 11 countries from Asia and Europe over the period 1980–2004. The empirical results state that one per cent increase in per capita GDP growth rate led to 2.8 per cent increase in remittances, yielding support towards the investment motive. Whereas, Coulibaly (2009) states that home country economic fluctuations do not influence the flow of remittances. Thus, the literature presents mixed evidence on the impact of home country economic conditions on remittances. However, a larger consensus is observed within the literature on the importance of host country factors.

Pegging the skill level of migrants to their level of remittances Schiopu & Siegfried (2006) state that higher skilled migrants tend to send higher remittances and support altruism for remitting in their study. Whereas, Adams (2008) and McCracken et al. (2017) contradict by stating that countries which export a larger share of high-skilled (educated) migrants receive less remittances than countries which export a larger proportion of low-skilled migrants, as high skill migrants often choose to bring their family to the host country or come from economically well-off families, and are not obliged to remit. Underscoring the

importance of home country factors, general risks in the home country such as political instability or low levels of law and order may deter remittances, since such an environment is not conducive for investment purposes (IMF, 2005), whereas political risk in host country did not deter the flow of remittances (McCracken et al. 2017). Lueth & Ruiz-Arranz (2006) find that political risk in both home and host countries seem to impact the flow of remittances. Less political risk in home or/and higher political risk in host country led to larger remittances. The study states that with increased political risk and unfavourable economic environment in host country, the opportunity cost of the migrant is adversely impacted leading to increased remittances.

The inclusion of demographic factors like the share of female employment or a high age-dependency ratio in the host country has adverse impact on remittances, while illiteracy rates affect them positively (Buch & Kuckulenz, 2010). They reason by stating that higher share of dependents meant that there were fewer persons in the working age category who typically migrate. Thus, the reduction in the share of people who migrate could be a possible explanation to decline in remittances. The dependency rate among the gravity estimations of Lueth & Ruiz-Arranz (2006) yielded significant positive coefficients indicating the influence of altruistic tendencies. The study found that with every one per cent increase in share of dependent population in the home country, remittances increased by 8.5 per cent. McCracken et al. (2017) also state that dependency differentials between home country (characterized by high share of dependent population) and host country (low share of dependent population) led to increased remittance flows. While Adams (2008) uses the population under the age of 14 years to capture the increase in remittance inflows due to increase in young dependent population. The empirical analysis fits in with the predictions of World Bank's Global Monitoring Report (2015) that regions facing high dependent population may witness surge in remittances due to migration of the working age population to countries experiencing low shares of dependent population. This might see a reversal with increased ageing in the developed world as migrants may move to ageing world from countries experiencing a boom in their working age population to provide personalized services like health care.

4. Methodology

This section describes the methodology used to estimate coefficients of macroeconomic determinants of remittance inflows for panel data comprising 40 countries³ over 1990 to 2016 (Appendix Table A.1 for sample countries). Using bilateral panel data for four South Asian countries (Bangladesh, India, Pakistan and Sri Lanka), macroeconomic determinants are estimated in a gravity model framework to provide region based analysis for the macroeconomic determinants of remittance inflows.

³ The entire panel consists of 70 countries, but reduced to 40 due to data limitations.

Following Baltagi (2005), TSLS estimation technique is presented as:

$$Rem_{it} = Y_{it}\gamma + X_{it}\beta + \mu_{it} \dots \dots \dots (1)$$

Where Y_{it} is the set of endogenous variables ($it \times k_1$ matrix; k_1 is the number of endogenous variables) and X_{it} is the set of exogenous variables ($it \times k_2$ matrix; k_2 is the number of exogenous variables). The analysis considers all variables as endogenous and hence, X_{it} variables are presented only for econometric understanding and γ, β are vectors of regressor parameters.

$$Y_{it} = X_{it}\lambda + Z_{it}\delta + \varepsilon_{it} \dots \dots \dots (2)$$

Where Z_{it} is the set of instrumental variables ($it \times k_3$ matrix; k_3 is the number of endogenous variables plus one additional instrument which is $k_3=k_1+1$) and δ is a vector of parameters. The analysis includes all explanatory variables as endogenous and their lagged values are used as instruments along with share of merchandise trade to GDP as an additional instrument. Thus, Z_{it} is Y_{it-1} and an additional IV. The inclusion of at least one additional instrument makes it possible to conduct Sargan-Hansen test of instrument validity. The estimated values of instrumented variables obtained from Equation (4.4) are substituted in Equation (4.3) to estimate the coefficients of the endogenous variables.

4.1. Model

4.1.1. Cross-Country Panel Model

The estimation is divided into two parts; the first part estimates the panel model for 70 countries (later reduced to 40) from 1990-2016.

$$\begin{aligned} LogRem_{it} = & \alpha + \beta_1 LogGDP_{it} + \beta_2 LogGDP_{oecd,t} + \beta_3 LogDGDP_{PC_{oecd,it}} + \beta_4 LogRER_{it} + \\ & \beta_5 Log Trade_{opn_{it}} + \beta_6 LogCredit_{it} + \beta_7 LogUnemp_{it} + \beta_8 LogGER_{it} + \beta_9 LogD_{Int_{oecd,it}} + \\ & \delta_1 LogYoung_{it} + \delta_2 LogOld_{it} + \gamma_1 Log Disaster_{it} + \gamma_2 Log Pol_{stability_{it}} + u_{it} \dots \dots \dots (3) \end{aligned}$$

Can also be re-written as:

$$Rem_{it} = X'_{it}\beta + Y'_{it}\delta + Z'_{it}\gamma + \alpha + \varepsilon_{it} \dots \dots \dots (4)$$

Where X represents all the macroeconomic variables, Y represents demographic variables and Z includes risk-related variables.

i: countries (1 to 70), *oecd*: is average for OECD nations and *t*: year (2000 to 2016)

Equation (3) builds on the microeconomic motives of altruism (compensatory) and self-exchange (opportunistic) and estimates macroeconomic determinants of remittance inflows. *Rem* stands for remittance inflows expressed as percentage of GDP. The independent variables include GDP of home and host country on the premise that it captures the income levels of family and migrant (Swamy, 1981; El-Sakka & McNabb, 1999; McCracken et al., 2017). The average GDP of OECD nations is used as a proxy for host country income, as migration is primarily directed towards high income and European countries included in OECD group. Difference between per capita incomes of OECD countries and home country (*DGDP_PC*) is included to examine whether increasing gap between incomes leads to larger remittances inflows (McCracken et al., 2017) supporting altruism motive. Following El-Sakka & McNabb (1999), Chami et al. (2008) and Lin (2011), real effective exchange rate (*RER*) is included as remittances are influenced by currency fluctuations. Lower inflows in response to depreciation in home country currency depicts compensatory motive, as lesser funds need to be remitted to maintain the same level of income.

Trade openness (*Trade_opn*) is used as a proxy for stronger international networks that can be exploited by migrants to shift to host countries. Inclusion of private credit (as a percentage of GDP) depicted by *Credit* explains the motives of remittance inflows. Decline in remittances upon increase in private credit indicates that remittances emanate from compensatory tendencies, as increased access to credit in home country reduces dependence on foreign funds for consumption and investments. Whereas, a rise in remittances indicate opportunistic motive, as increase in credit availability would suggest financial deepening in the home country accompanied with increased returns (Lueth & Ruiz-Arranz, 2008). Unemployment (*Unemp*) in the home country can trigger large emigration in search of better job prospects abroad. Gross enrolment ratio (*GER*) is included as a proxy of level of education and skill in the home country. There are two ways through which skill may affect remittances. One, if higher skill leads to increased remittances, this suggests increased incentive to shift to an economically better location, whereas if there is a decline, it indicates that countries that have higher skill and higher education levels are remittance sending countries. The difference in interest rates (Home country and LIBOR) captures the opportunistic motive, suggesting that increased inflows of remittances with increasing gap between the interest rates is triggered by the profit motive to increase returns through investments in home country.

Demographic variables include dependency ratios. One could look at the impact of these from inheritance motive as well as compensatory motive. A positive impact on remittances due to high young dependency ratio implies compensatory motive; to provide for the younger ones in the family, whereas a negative impact implies dampening of inheritance motive due to presence of many dependents (McCracken et al., 2017). In same vein, the analysis includes elderly dependency ratio (*Old*) to estimate whether remittances

increase in the presence of elderly dependent population. Dependency ratios of young and old have usually been combined, whereas the analysis in this paper segregates the two dependent populations to understand whether elderly population also promotes larger remittances. A priori, the expected sign for elderly dependent population is assumed to be negative as ageing societies are developed nations which are remittance sending and also the elderly fall back on their savings rather than remittances in most cases.

Among the risk variables, *Disaster* variable depicts the number of people affected by natural calamities. A positive association suggests altruism as remittances react in order to compensate for the income loss (insurance motive), whereas a negative impact would suggest the contrary. The analysis includes impact of political stability in home country, *Pol_stability* is a composite index of 6 indicators of political risk⁴. A more stable political environment would encourage remittance inflows if borne of opportunistic motives, as financial stability follows political stability, whereas in case of political unrest, one would expect more remittances supporting insurance motive.

4.1.2. Gravity Model for South Asian Countries

Using the bilateral data of remittance inflows for four South Asian countries, Bangladesh, India, Pakistan and Sri Lanka from 27 source countries which accounted for nearly 90 per cent of the remittance inflow (Appendix Table A.2 for list of source countries) for the period 2010-2016, a gravity model is estimated to capture the impact of macroeconomic determinants. The analysis provides a deeper understanding of the determinants at play for remittances into South Asia, which is the second highest recipient region for remittances. The model is as follows.

$$\begin{aligned}
 \text{LogRem}_{ij}^t = & \alpha + \beta_1 \text{Log GDP}_i^t + \beta_2 \text{Log GDP}_j^t + \beta_3 \text{LogDGGDP_PC}_{ji}^t + \beta_4 \text{LogDistance}_{ij} + \\
 & \beta_5 \text{Language}_{ij} + \beta_6 \text{LogCredit}_j^t + \beta_7 \text{LogCredit}_i^t + \beta_8 \text{Log RER}_j^t + \beta_9 \text{Log RER}_i^t + \\
 & \beta_9 \text{LogD_Int}_{ij}^t + \beta_{10} \text{LogCost_Remit}_i^t + \beta_{11} \text{LogD_Skill}_{ji}^t + \delta_1 D_Dependency_{ij}^t + \\
 & \delta_2 \{ \text{LogD_Skill}_{ji}^t * D_Dependency_{ij}^t \} + \gamma_1 \text{LogPol_Stability}_j^t + \gamma_2 \text{LogPol_Stability}_i^t + \\
 & \gamma_3 \text{LogDisaster}_i^t + \mu_{ij} \dots\dots\dots(5)
 \end{aligned}$$

Where *i*: home countries (Bangladesh, India, Pakistan and Sri Lanka), *j*: 27 host nations and *t*: year (2010 to 2016).

The analysis uses remittance inflows which includes private transfers and compensation of employees for panel data analysis. Apart from the variables included in Equation (3), the model includes *Distance*

⁴ The Political stability variable includes Voice and Accountability, Political Stability in the absence of violence, Government Effectiveness, Regulatory Quality, Rule of Law and Control of Corruption.

variable to analyse whether staying close to home country increases remittances due to proximity and continued interactions as compared to staying farther away, which could inhibit migrants in maintaining connections with family due to infrequent visits and dampening of inheritance motive. Studies (Leuth & Ruiz-Arranz, 2008; McCracken, 2017) have used distance as a proxy for cost to remit which may not be appropriate, as cost to remit are unaffected by distances with the use of technology enabled formats. The model overcomes it by including the cost to remit variable (*cost_remit*) which measures the average cost to remit to the home country. The other core gravity variable is *Language* which is a dummy variable and attempts to capture the impact of commonality of language. The difference in interest rate, skill and dependency between home and host is calculated as:

$$\text{Log } D_Int_{it}^t = \text{Log } Int_i^t - \text{Log } Int_j^t \dots \dots \dots (6)$$

$$\text{Log } D_Skill_{ji}^t = \text{Log } Skill_j^t - \text{Log } Skill_i^t \dots \dots \dots (7)$$

$$D_Dependency_{ij}^t = Dependency_i^t - Dependency_j^t \dots \dots \dots (8)$$

An interaction term $\{ \text{Log } D_Skill_{ji}^t * D_Dependency_{ij}^t \}$ is included following McCracken et al. (2017) which captures the possibility that more remittances are sent from countries that have higher skill base and lower dependency ratios.

The risk variables are expanded to include the political stability in host country which accounts for the possibility that remittances will decline if originating out of opportunistic motive as stability in host country provides better investment opportunities.

4.2. Variables and Data Sources

Table 2 gives the variable description, measurement of the variable and the expected sign.

Table 2. Variable Description and Expected Sign

Variable	Measurement	Expected sign
Host country GDP	USD constant 2010	(+)
Home country GDP	USD constant 2010	(-)
Difference per capita income	USD constant 2010	Altruism (+) Self-interest (-)
Home country exchange rate	Real exchange rate (per US\$)	Atruism (-) Self-interest (+)
Home country trade openness	KOF index of Globalisation	(+)
Home country private sector credit	Domestic credit to private sector (% of GDP)	Atruism (-) Self-interest (+)
Home country Unemployment Rate	Percentage of total Labour force	(+)
Home country gross enrolment ratio, tertiary	Gross enrolment in tertiary education	(+)/(-)

Difference interest rate (home-host)	Real deposit interest rate	Self-interest (+)
Home country young age dependency ratio (0-15)	Percentage of 15-64 population	Altruism (+) Self-interest (-)
Home country old age dependency ratio (65 and above)	Percentage of 15-64 population	(-)
Disaster in home country	Number of people affected natural and man-made calamities	Altruism (+) Self-interest (-)
Political risk in home country	Composite index comprising of 6 indicators (0 to 6 with 6 having least risk)	Altruism (+) Self-interest (-)
Additional variables included in Gravity model		
Host country private sector credit	Domestic credit to private sector (% of GDP)	Altruism (+) Self-interest (-)
Difference skill (Host-Home)	Gross enrolment in tertiary education	Altruism (+) Self-interest (-)
Difference in age (young + old) dependency ratio (Home-Host)	Percentage of 15-64 population	Altruism (+) Self-interest (-)
Interaction difference skill and difference dependency ratio		Altruism (-)
Cost to remit to home country	Average transaction cost of sending remittances (%)	Altruism (+) Self-interest (-)
Political risk in host country	Composite index comprising of 6 indicators (0 to 6 with 6 having least risk)	Self-interest (-)

Source: Author.

Table 3 provides the summary statistics for the cross-country panel model variables used in Equation (3) and Table 4 presents the summary statistics for gravity model variables in Equation (5).

Table 3. Summary Statistics for Variables in Cross-Country Model

Variable	Observations	Mean	Std. Dev.	Min	Max
Remit home	1,806	20.53	1.84	13.16	24.98
GDP home	1,850	24.98	2.15	19.59	30.46
GDP OCED	1,890	31.30	0.16	31.01	31.53
DGDP_PC	1,850	1.79	1.52	-1.11	4.51
RER home	1,754	3.30	2.69	-1.09	10.25
Trade_opn home	1,869	3.89	0.58	0.43	4.58
Credit home	1,635	3.64	0.95	0.48	11.55
Unemployment home	1,794	2.00	0.68	-2.30	3.42
GER home	1,395	3.22	1.01	-0.45	4.84
D_Interest	1,118	1.42	0.94	-1.20	4.04
Young dependency home	1,890	3.80	0.47	2.93	4.73
Old dependency home	1,890	2.41	0.57	1.46	3.78
Disaster home	1,238	9.80	3.83	0.00	19.66
Pol_Sability home	1,095	1.32	0.27	0.35	1.78

Note: All variables are measured in log values.

Source: Author's computations.

Table 4. Summary Statistics for Variables in Gravity Model

Variable	Observations	Mean	Std. Dev.	Min	Max
Remit home	740	18.60	2.04	13.97	23.36
GDP host	776	27.15	1.39	23.97	30.46
GDP home	777	26.22	1.26	24.76	28.53
DGDP_PC	762	3.18	0.86	0.26	4.75
RER host	777	0.85	1.60	-1.29	4.88
RER home	777	4.45	0.31	3.82	4.98
Credit host	717	4.58	0.46	3.53	5.27
Credit home	777	3.52	0.43	2.73	3.96
D_Skill	417	1.33	0.57	-0.79	2.39
D_Dependency	777	9.85	13.26	-13.82	51.90
D_Skill*D_Dependency	412	9.28	15.97	-29.81	64.15
D_Interest	649	1.63	1.17	-0.40	6.19
Cost_Remit home	449	3.71	0.48	1.64	4.96
Pol_Stability host	777	1.43	0.28	0.78	1.75
Pol_Stability home	777	0.79	0.43	0.39	2.60
Disaster home	666	14.66	1.50	10.21	16.83

Note: All variables are measured in log values except D_Dependency.

Source: Author's computations.

Tables 5 and 6 present the correlation matrix for the variables used in cross-country panel and South-Asia specific gravity model respectively.

Table 5. Correlation Matrix for Cross-Country Model

	Remit home	GDP home	GDP OCE D	DGD P_PC	RER home	Trade_ opn home	Credit home	Unem p home	GER home	D_Int	Young dep home	Old dep home	Disaste r home	Pol _Sabilit y home
Remit home	1													
GDP home	0.62	1												
GDP OCE D	0.33	0.12	1											
DGD P_PC	-0.09	-0.55	-0.04	1										
RER home	-0.04	-0.18	-0.13	0.52	1									
Trade_ opn home	0.35	0.49	0.32	-0.59	-0.35	1								
Credit home	0.14	0.44	0.29	-0.69	-0.50	0.44	1							
Unemp home	0.02	-0.06	-0.02	-0.07	-0.19	0.05	-0.13	1						
GER home	0.28	0.61	0.32	-0.74	-0.44	0.67	0.62	0.19	1					
D_Int	0.09	-0.20	0.43	0.41	0.23	-0.11	-0.25	0.10	-0.10	1				
Young dep home	-0.20	-0.53	-0.24	0.84	0.39	-0.63	-0.72	-0.01	-0.78	0.25	1			
Old dep home	0.12	0.49	0.11	-0.87	-0.46	0.62	0.64	0.06	0.69	-0.35	-0.90	1		
Disaster home	0.18	0.01	0.05	0.43	0.30	-0.31	-0.17	-0.22	-0.29	0.22	0.32	-0.42	1	
Pol _Sability home	-0.01	0.43	-0.06	-0.85	-0.51	0.68	0.71	-0.11	0.63	-0.49	-0.75	0.80	-0.38	1

Note: All variables are measured in log values.

Source: Author's computations.

Table 6. Correlation Matrix Gravity Model

	Remit home	GDP host	GDP home	DGD P_PC	RER host	RER home	Credit host	Credit home	D_Sk ill	D_Dep	D_Skil l*D_D ep	D_Int	Cost_R emit home	Pol_Sta bility host	Pol_Sta bility home	Lang	Disas ter
Remit home	1.00																
GDP host	0.10	1.00															
GDP home	0.36	-0.01	1.00														
DGDP_PC	-0.17	0.09	0.14	1.00													
RER host	-0.22	0.11	-0.03	-0.17	1.00												
RER home	-0.24	0.02	-0.82	-0.31	0.03	1.00											
Credit host	-0.36	0.44	0.03	0.19	0.10	-0.01	1.00										
Credit home	0.09	-0.01	0.37	-0.07	-0.02	-0.46	0.02	1.00									
D_Skill	-0.37	0.32	-0.33	0.29	-0.04	0.23	0.42	-0.52	1.00								
D_Dep	0.37	-0.48	0.02	0.09	-0.17	-0.04	-0.35	-0.37	-0.23	1.00							
D_Skill*D _Dep	-0.06	-0.07	-0.08	0.14	-0.10	0.05	0.10	-0.67	0.57	0.54	1.00						
D_Int	-0.06	0.06	0.08	0.24	-0.07	-0.04	0.24	0.10	-0.16	0.05	0.00	1.00					
Cost_Rem it home	-0.28	0.28	0.26	0.16	0.04	-0.18	0.43	0.05	0.15	-0.45	-0.14	0.13	1.00				
Pol_Stabili ty host	-0.43	0.33	0.03	0.58	-0.06	-0.02	0.60	0.02	0.37	-0.42	-0.16	0.30	0.56	1.00			
Pol_Stabili ty home	0.15	0.00	0.28	-0.30	0.00	0.02	0.02	0.41	-0.42	-0.27	-0.49	0.05	0.16	0.02	1.00		
Lang	0.18	0.16	0.17	0.16	0.07	-0.22	0.11	-0.04	0.25	-0.08	0.13	-0.07	0.02	0.23	-0.14	1.00	
Disaster	0.16	-0.01	0.54	0.26	-0.02	-0.56	0.00	0.07	0.04	0.16	0.22	0.02	0.04	0.00	-0.02	0.19	1.00

Note: All variables are measured in log values except D_Dep.

Source: Author's computations.

The database for macroeconomic variables is World Development Indicators (WDI) of the World Bank (2017). The bilateral data on remittance inflows is sourced from Migration and Remittances data of the World Bank (2017). The KOF Globalisation Index on Trade Globalisation (de jure) by Gygli et al. (2018) is used as a measure of trade openness for the panel countries. Political risk variables are sourced from International Country Risk Guide (ICRG) published by Political Risk Services (2018) and data on natural disasters is made available by EM-DAT published by Centre for Research on the Epidemiology of Disasters- CRED (2018).

5. Empirical results

The empirical results are presented in following three sub-sections. The first section discusses estimation results obtained from cross-country panel presented in Equation (3), followed by estimates the gravity model (Equation (5)) for South Asian countries (Bangladesh, India, Pakistan and Sri Lanka) which incorporates additional home and host country determinants and to draw comparisons with the estimated coefficients of cross country panel model.

5.1. Cross-Country Analysis

Table 7 presents the estimated coefficients for macroeconomic determinants of remittance inflows for a cross section of 70 countries from 1990-2016. The first column (1) estimates pooled OLS regression model. Country and time fixed effects are added to control for country specific idiosyncrasies and differences. The log-log model depicts elasticity of remittances with respect to changes in explanatory variables. The home country GDP as expected has a negative impact on remittances, whereas host country GDP (proxied by average of OECD Countries) has a positive coefficient though insignificant. Rising difference between per capita incomes between host and home countries has a positive impact suggested by the significant positive coefficient of DGDP_PC variable. The increasing financial credit access at home was negatively associated with remittances. The model is tested for functional form misspecification and omitted variables bias through Ramsay RESET test which suggests that the model did suffer from misspecification and omission of relevant variables. The model is re-estimated by incorporating the demographic variables and risk variables using fixed effects (FE) technique after employing Hausman test and F test for poolability of the dataset.

The FE model presented in column (2) of Table 7 shows that GDP of home country continues to have a significant negative sign suggesting rising income at home leads to reduced remittance inflows in support of altruism. Positive sign for GDP of host country indicates that rising incomes for migrants leads to increased remittances back home concurring the idea of altruism, while difference in per capita incomes between host and home has no significant impact on remittance inflows.

Depreciation of home country's real exchange rate leads to higher remittances in support of investment motive (opportunistic), as currency depreciation makes it economical for migrants to purchase assets and invest in their home country. The trade openness variable turns significant in FE model highlighting the positive impact of an integrated economy for migration and flow of remittances. Financial credit to private sector a proxy for financial deepening in the home country has a significant negative impact as expected. This implies that increased financial access in the home country reduces the dependence of family members on remittances, again supporting altruism motive. The skill level of home country and unemployment rate are accompanied by insignificant coefficients. Whereas, interest rate differential between home and host country (deposit interest rates) is significant and positive indicating self-interest motive, as higher interest rate at home country leads to increased remittance inflows.

Table 5.7. Determinants of Remittance Inflows; Estimates of Cross-Country Panel Model
Dependent Variable: Remittance inflows (percentage of GDP)

Independent variables	Pooled		Fixed Effects		TSLS (FE)	
	(1)	(2)	(3)	(4)	(5)	(6)
Log GDP home	-0.30***	(-3.06)	-1.16*	(-1.63)	-2.69***	(-3.57)
Log GDP host	0.69	(0.91)	6.41***	(4.97)	10.31***	(4.89)
Log DGDP_PC	0.75***	(4.47)	-1.16	(-1.54)	-2.70***	(-3.44)
Log RER	-0.09*	(-1.76)	1.05***	(5.32)	0.80**	(2.51)
Log Trade_opn	0.45	(1.36)	0.59***	(3.31)	0.69**	(2.56)
Log Credit	-0.35*	(-1.70)	-0.1**	(-2.54)	-0.40***	(-2.97)
Log Unemp	0.22	(1.50)	-0.16	(-1.08)	-0.35	(-1.52)
Log GER	0.34	(1.52)	-0.12	(-0.72)	-0.03	(-0.15)
Log D_int			0.24**	(2.04)	0.12**	(2.25)
Log Young			2.39***	(4.51)	2.32***	(3.28)
Log Old			-1.22**	(-2.53)	-1.74**	(-2.54)
Log Disaster			0.01	(1.58)		
Log Pol_stability			0.46*	(1.78)	0.22	(0.53)
Constant	-16.59	(-0.74)	-181.1***	(-6.60)	-257.39***	(-5.07)
No of obs.	1056		358		328	
Countries	70		43		40	
Avg. no of obs. per country			8.3		8.2	
Time fixed effects	Yes		Yes		No	
Country fixed effects	Yes		Yes		Yes	
RESET ^a	5.08***					
F test for fixed effects ^b			56.75***		62.58***	
Hausmantest ^c			121.85***		143.03***	
Anderson-Rubin Wald F test ^c					14.03***	
Kleibergen-Paap LM test ^d					13.95***	
Sargan-Hansen test ^e					2.23	

Note: ***, **, * Denotes significance at the 1, 5 and 10 per cent level respectively.

Source: Author's estimation based on equation (5.1).

Values in parentheses are *t*-statistic.

Heteroscedasticity robust standard errors are used to calculate *t*-statistic.

^aRamsey RESET test for functional form misspecification and omitted non-linear variables. H_0 : model is correctly specified and there are no omitted non-linear variables.

^bF test for poolability. Jointly tests the null, H_0 : none of the country dummies are significantly different than 0.

^cHausman tests fixed effects against random effects model. H_0 : difference in coefficients not systematic, random effects is favoured.

^cAnderson-Rubin Wald Tests joint significance of endogenous regressors, relevant instruments test. H_0 : $B_1=0$ and orthogonality conditions are valid.

^dKleibergen-Paap LM, under-identification test. H_0 : matrix of reduced form equations is under-identified.

^eSargan-Hansen test of over-identifying restrictions. H_0 : instruments are exogenous.

For demographic variables, young age dependency ratio is accompanied by a positive sign suggesting that countries that have large young dependent population attract larger remittances, whereas it is the opposite for old dependency ratio. Old population may not attract remittances, as the countries that are recipients are in their early demographic dividend phase and countries that have relatively larger elderly population are remittance sending countries. Another factor could be that elderly population usually use their savings rather than depend on remittances. Among the risk variables, it is observed that disaster variable which measures the number of people affected by natural and man-made disasters supports a positive sign but is insignificant. Whereas, higher political stability in home country increases remittance inflows, which is suggestive of investment motive as stability ensures higher profits and returns in home country.

The estimated coefficients may be biased due to endogeneity problem by simultaneous determination of remittance inflows and macroeconomic determinants. Following Baltagi (2005), TSLS technique is used to correct for the endogeneity bias. The TSLS results are presented in column (3) of Table 7. A comparison between columns (2) and (3) shows that estimated coefficients of all variables maintain their sign and significance except per capita income differential which turn significant, and political stability variable which turns insignificant in column (3). The disaster variable was removed from TSLS estimation as the first-stage F-statistic was less than 10 (Staiger and Stock, 1997). The Anderson-Rubin Wald test, Kleibergen-Paap test and Sargan-Hansen test indicate that the model does not suffer from invalidity of instruments, under-identification and endogeneity bias.

The signs of estimated coefficients do not change between columns (2) and (3) indicating robustness of the included variables. The coefficients for GDP variables, credit to private sector and young dependent population reinforce the altruism motive, whereas per capita income differential, RER and interest rate differential support investment motive.

The results show that one percentage increase in GDP of home country reduces remittance inflows by 2.69 per cent (Table 5.7, column (3)), whereas in the case of GDP of host country, it increases remittance inflows by 10.31 per cent. Apart from GDP variables, demographic variables also have significant coefficients of considerable magnitude. A percentage change in young dependency ratio increases remittances by 2.32 per cent, whereas for old dependency ratio it is -1.74 per cent.

5.2. Gravity model for South Asian countries

This section presents the estimated coefficients for Equation (5) and presented in Table 8 of the panel gravity model for Bangladesh, India, Pakistan and Sri Lanka from 27 source countries. Pooled model highlights the significance of all core gravity variables used, GDP home and host country, language and distance. Due to misspecification of the equation and omitted variables bias (RESET test), random effects (RE) technique of estimation is used after testing for favourability of RE (Hasuaman test and Breusch-Pagan LM test) and incorporation of relevant macroeconomic variables.

The results of RE model are presented in column (2) of Table 8 without risk variables and column (3) with the inclusion of risk variables. The macroeconomic determinants maintain their sign and significance across both the RE specifications except RER host which turns positive and significant. With the controlling of risk factors in column (3), depreciation of host country currency does not inhibit migrants from sending remittances home, suggesting altruism motive. Estimated coefficients from columns (2) and (3) highlight the importance of host country income as compared to home country. The widening gap between host and home country per capita income continues with a negative sign, also observed in Table 5.7 which reinforces the fact the migrants in high income countries tend to remit less. This is for two reasons, (a) they have weakened intentions of returning home and (b) moving to a high income country suggests that the migrants have higher skill base which reflective of the economic condition of their family which may be less dependent on remittances.

Among the gravity variables, language supports a strong positive association with bilateral inflows. Migrants to countries that have large English speaking population tend to remit more. India, Bangladesh and Pakistan have large English speaking population and sharing common language (English) with host countries may assist the migrants in better employment and acceptance in the host countries. The inclusion of average cost of remitting home does not yield any significant impact.

Table 8. Determinants of Remittance Inflows, Gravity Model, 2010-2016

Dependent Variable: Log Remittances (in USD)

Independent variables	Pooled (1)	Random Effects (2)	Random Effects (3)	TSLs (RE) (4)
Log GDP host	0.43*** (9.01)	0.60*** (3.39)	0.74*** (3.61)	0.51*** (5.32)
Log GDP home	0.51*** (10.65)	0.25* (1.92)	0.15 (0.95)	0.47*** (2.68)
Log GDP PC	-0.19*** (-2.11)	-0.55* (-1.81)	-0.81** (-1.99)	-0.16 (-0.68)
Log Distance	-1.61*** (-9.87)	-0.43 (-0.58)	-1.65 (-1.41)	
Language	1.01*** (7.10)	2.26*** (5.44)	2.15*** (4.45)	1.36*** (4.38)
Log Credit host		-0.08 (-0.35)	-0.01 (-0.05)	0.21 (0.65)
Log Credit home		-0.25 (-0.84)	-0.33 (-1.00)	-0.38 (-0.78)
Log RER host		-0.09 (-0.88)	0.34* (1.75)	-0.37*** (-6.16)
Log RER home		-0.51 (-1.21)	-0.76 (-1.57)	0.04 (0.04)
Log D_int		0.06 (1.00)	0.09 (1.34)	-0.07 (-0.60)
Log cost_remit		0.03 (0.33)	0.08 (0.70)	
Log D_skill		-0.16 (-0.47)	-0.46 (-1.30)	-0.49 (-1.30)
D_dependency		0.08*** (6.10)	0.075*** (4.41)	0.07*** (3.39)
Log D_skill *		-0.03*** (-3.70)	-0.02*** (-2.88)	-0.03*** (-3.16)
D_dependency				
Log Pol_ stability host			-1.58 (-1.45)	-1.20* (-1.77)
Log Pol_ stability home			-0.1*** (-3.02)	0.005 (0.14)
Log Disaster			0.03** (2.07)	0.03** (2.74)
Constant	7.67*** (3.85)	3.36 (0.56)	18.05 (1.33)	-5.801 (-0.54)
No of observations	724	175	175	255
No. of pairs		52	52	80
Avg. no of observations per country		3.4	3.4	3.2
Time fixed effects	Yes	No	Yes	Yes
RESET ^a	4.64***			
Breusch-Pagan LM test ^b		128.47***	136.12***	
Hausmantest ^c		18.82*	17.2*	
Anderson-Rubin Wald F test ^c				17.30***
Kleibergen-Paap LM test ^d				30.52***

Note: ***, **, * Denotes significance at the 1, 5 and 10 per cent level.

Source: Author's estimation based on equation (5.3).

Values in parentheses are t-statistic.

Heteroscedasticity robust standard errors are used to calculate t-statistic.

^aRamsey RESET test for functional form misspecification and omitted non-linear variables. H_0 : model is correctly specified and there are no omitted non-linear variables.

^bF test for poolability. Jointly tests the null, H_0 : none of the country dummies are significantly different than 0.

^cHausman tests fixed effects against random effects model. H_0 : difference in coefficients not systematic, random effects is favoured.

^cAnderson-Rubin Wald Tests joint significance of endogenous regressors, relevant instruments test. H_0 : $B_1=0$ and orthogonality conditions are valid.

^dKleibergen-Paap LM, under-identification test. H_0 : matrix of reduced form equations is under-identified.

The difference in age dependency (both young and old) between home and host countries is positive and significant in all the specifications implying that migrants tend to remit out of altruism due the presence of dependents back home. The skill differential remains insignificant, but its interaction with difference in dependency is accompanied by significant negative sign, which states that migrants remit less from countries that are relatively more skilled and have lower age dependency ratio. This further supports negative sign accompanying coefficient of income differential, as countries that have higher incomes also have a higher skill base and thus, migrants remit less from countries that are economically advanced. Political stability at home reduces flow of remittances. This supports altruism motive as greater stability at home increases the opportunities for family members for employment, credit access and income, thus reducing their dependence on remittances. The estimation finds strong support for increased remittances during calamities as disaster variable is significant and positive at 5 per cent level. The disaster variable was insignificant in the cross country panel model whereas it turns significant for gravity model, one reason could be that the home countries included are afflicted by large scale natural disasters frequently.

In order to overcome the endogeneity problem associated with macroeconomic analysis, gravity equation is estimated using TSLS technique. Except for RER host and Pol_stability at home variables all other significant variables maintain the sign and significance, supporting robustness of the estimations. Distance and cost to remit were dropped on the grounds of first-stage F-statistic being less than 10 (Staiger and Stock, 1997) and large missing data respectively. Furthermore, both variables had insignificant coefficients to being with and their removal did not alter results for majority of the variables in column (4). The estimations tested for relevance of instruments used and whether it suffered from under-identification (Anderson-Rubin Wald Test and Kleibergen-Paap LM). The TSLS equation was exactly identified with as many instruments as endogenous variables.

A change in sign for RER host variable shows that host country currency may not have an immediate impact on remittances but inclusion of the lagged instrument reduced remittances, implying that migrants reduce their remittance in the event of prolonged currency depreciation of host country. Another interesting result is the negative coefficient associated with political stability in host country. Stable political conditions in host country reduce remittances to home

country suggesting self-interest motive, as better investment opportunities are associated with political stability in host country. The same result may be interpreted as, decline in stability or rise in political risk in host country may result in remittance inflows. The disaster variable is positive and significant in TSLS specification, reinforcing altruism motive directing the flow of remittances.

Estimated results highlight the role of host country income which has the highest impact on remittance inflows, followed by presence of dependent population and occurrence of natural calamity, largely adhering to altruism motive. These results indicate that remittance inflows are higher from host countries that have relatively lower skill base compared to advanced, high skilled countries. Further, policy variables such as trade openness, credit to private sector and RER have limited impact on changes in remittance inflows, thus, reducing the policy space for improving remittance inflows.

6. Conclusion and Policy Implications

The analysis highlighted the contribution of various macroeconomic variables towards remittance inflows. The comparison between cross country panel estimations and gravity model estimations highlight the importance of host country income. Rising incomes in host country leads to increased remittances whereas in both the models larger gap between per capita incomes reduces remittances. While the increase in remittances associated with increase in host country GDP supports altruism, at the same time rising gap between incomes of host and home country point towards self-interest motive. One way to reconcile would be to state that migrants relocating to highly advanced countries with high incomes remit less as compared to migrants who shift to countries which are only slightly advanced when compared to home countries. Considering the skill differential which even though, insignificant has a negative sign pointing to the same idea that migrants to highly skilled countries tend to remit less. Remittances rise with larger young dependent population and decrease with elderly population. This could be due to the fact that younger dependents require more financial support than elderly. Increased financial access in home country reduced remittance inflows as access to domestic credit reduced the dependence of family members on remittances for economic activities.

The common language between home and host countries contributed to better employment prospects and easy transition and absorption of migrants into host country, thereby improving

remittances back home. Inclusion of risk variables examining the impact of political stability in home and host country and prevalence of natural calamities bring out interesting results. While political stability in home country under cross country panel model yielded negative impact implying reduced remittances in the presence of political stability in home country, the gravity model showed that political stability in host country reduced remittances. The reduction in remittances to home country in the presence of stable political environment suggests altruism as, stability ensure better economic prospects for the family members decreasing the dependence on financial support in the form of remittances. On the other hand, the reduction in remittances due to political stability in the host country supports self-interest motive as migrants can improve their returns by investing in host country. The remittances were also sensitive towards natural calamities and disasters, a larger response was observed from migrants when larger people were affected by disasters, in support of the altruistic motive.

The study has some important policy implications especially for South Asian countries. First, it is observed that less skilled migrants remit more home, thus, training and developing the youth in vocational and mid-skill level jobs will provide opportunities for aspiring emigrants for temporary migration. Secondly, newer avenues need to be discovered for aspiring emigrants given the rise in antagonism and anti-migrant sentiments in the traditional destinations for migration (such as Gulf region, US and UK). Thirdly, during natural disasters increase remittance inflows as migrants wish to compensate their family, and also during political instability in host country remittances increase, as migrants may presume a loss of income in future and safeguard it by sending it home. Improving the channels and making it convenient to remit during such events can further increase inflows. Lastly, negotiating for a larger access to foreign markets through easier movement of labour could be focused upon to give a boost to remittance inflows as countries delve into multiple regional trade agreements.

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Appendix

Table A.1. Sample Countries, Cross-Country Panel Model

1	Albania	19	Dominican Rep.	37	Kenya	55	Senegal
2	Antigua & Barbuda	20	Egypt, Arab Rep.	38	Korea, Rep.	56	Spain
3	Argentina	21	El Salvador	39	Luxembourg	57	Sri Lanka
4	Armenia	22	Fiji	40	Mali	58	Sudan
5	Austria	23	Finland	41	Malta	59	Sweden
6	Bangladesh	24	France	42	Mauritius	60	Syrian Arab Republic
7	Barbados	25	Greece	43	Mexico	61	Tajikistan
8	Belgium	26	Honduras	44	Morocco	62	Thailand
9	Bolivia	27	Hungary	45	Nepal	63	Togo
10	Brazil	28	India	46	New Zealand	64	Tunisia
11	Burkina Faso	29	Indonesia	47	Nicaragua	65	Turkey
12	Cabo Verde	30	Iran, Islamic Rep.	48	Nigeria	66	Uganda
13	Cambodia	31	Ireland	49	Norway	67	United Kingdom
14	Colombia	32	Israel	50	Pakistan	68	United States
15	Costa Rica	33	Italy	51	Panama	69	West Bank and Gaza
16	Croatia	34	Jamaica	52	Philippines	70	Yemen, Rep.
17	Cyprus	35	Japan	53	Poland		
18	Denmark	36	Jordan	54	Portugal		

Note: Countries in bold indicate the final sample included in the TSLS estimation in Table 5.7, column (3)

Source: Author.

Table A.2. Sample Countries, Gravity Model

1	Australia	8	Ireland	15	New Zealand	22	Sweden
2	Bahrain	9	Israel	16	Norway	23	Switzerland
3	Belgium	10	Italy	17	Oman	24	Thailand
4	Canada	11	Japan	18	Qatar	25	United Arab Emirates
5	Denmark	12	Kuwait	19	Saudi Arabia	26	United Kingdom
6	France	13	Malaysia	20	Singapore	27	United States
7	Germany	14	Netherlands	21	Spain		

Source: Author.