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Impact of Remittances on Economic Growth in Developing Countries: The Role of Openness

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Abstract:
The paper examines the empirical relationship between remittances and economic growth for a sample of 62 developing countries over the time period 1990–2014. Remittances seem to promote growth only in the 'more open' countries. That is because remittances are in themselves not sufficient for growth. The extent of the benefit depends on domestic institutions and macroeconomic environment in the receiving country. Unlike the 'less open' countries, 'more open' countries have better institutions and better financial markets to take advantage of the remittances income and channelise them into profitable investments which, in turn, accelerates the rate of economic growth in these countries.

Keywords: remittances, economic growth, openness, developing countries, panel data

JEL classification: F24, F41, F43, F63

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1 Introduction

Workers' remittances are transfers of income from international migrants to family members in the workers' country of origin. According to estimates by World Bank (2015), remittances received by developing countries have grown by around 29 % between 2010 and 2014 from $291.9 billion to $377.8 billion. Remittances represent a substantial flow of financial resources from developed to developing countries, second only to foreign direct investment (Figure 1). Relatively speaking, the volume of foreign aid (Official Development Assistance or ODA) was a meager $237.6 million in 2014 (Figure 2).

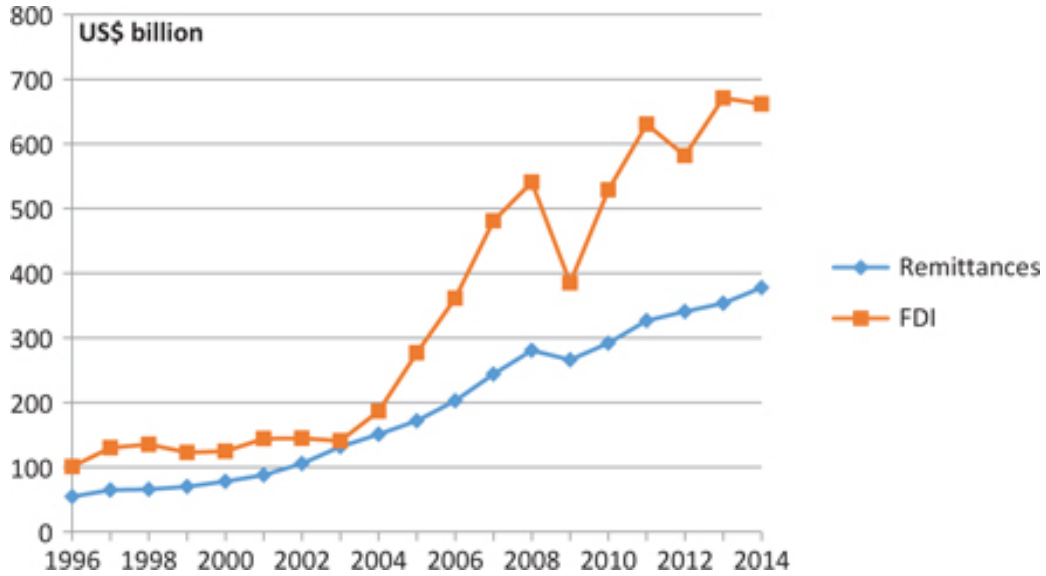

Figure 1: Remittances and FDI received by developing countries, 1996–2014.

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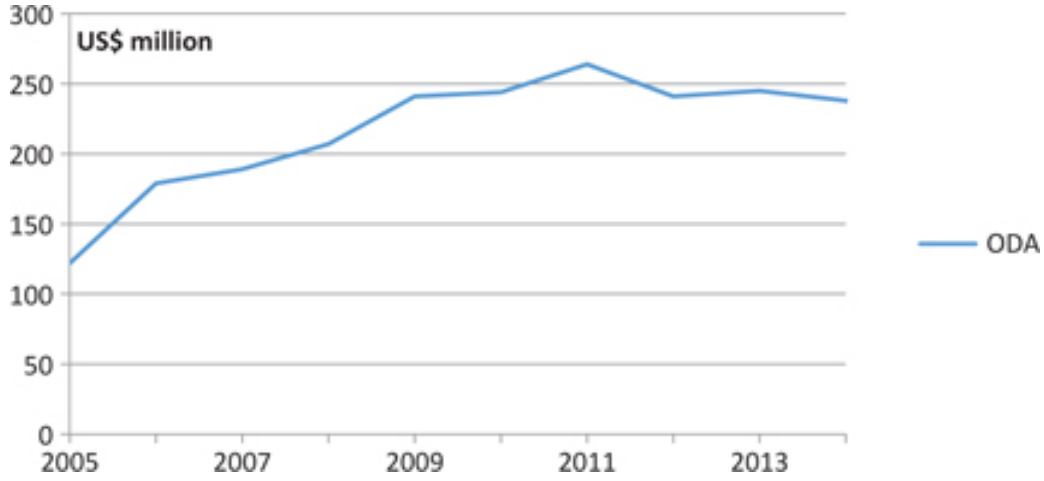

Figure 2: Foreign aid received by developing countries, 2005–2014.

Moreover, remittances seem to be less volatile than other sources of external finance such as FDI and ODA because of the former's countercyclical nature. As can be seen in the Figure 2, the growth in the volume of aid seems to have stagnated in 2009 and has stayed approximately at the same level over the last five years. Even FDI inflows experienced a sharper decline after the 2008 crisis and showed greater volatility in the post-crisis period. Contrary to that, remittances experienced a much smaller decline after 2008. For instance, during the time period 2010–2014, the annual average growth rate in remittances received by developing countries was 6.72 % whereas that of FDI and ODA were 6.36 % and −0.4 % respectively. Many studies have found evidence in support of the countercyclical nature of remittances (Chami et al. 2008; Frankel 2011). Such countercyclical behavior of remittances can probably be attributed to the fact that a large proportion of these transfers are intended for altruistic purposes (Agarwal and Horowitz 2002). Workers may try to remit more money back home during the times of economic distress to help their families financially (Ratha 2013). This, in turn, may act as a counterbalance against the negative effects of a recession, ensure stability in consumption level and thus aid in economic growth.

Hypothetically speaking, there are multiple channels through which remittances exert a positive impact at the household as well as country level. It acts as a major vehicle for reducing the scale of poverty in developing countries. Besides monetary gains, remittances enable families in poorer countries to invest in health and education. There are positive spill-over effects associated with remittances. For instance, the increased expenditure on consumption and investment by remittance-receiving households benefits others in the community. Finally, remittances add to the foreign reserves of the receiver countries and increase their creditworthiness.

Quite a few studies have examined the remittances-growth relationship (see Section 3) however the empirical literature on the effects of remittances on growth still appears to be inconclusive (Barajas et al. 2009; Nwaogu and Ryan 2015). It is true that use of different model specifications, estimation techniques and mix of countries in the sample by different studies drives this inconsistency in findings to a large extent. However, this is not the sole reason behind the discrepancy in the empirical literature and 'openness' seems to play a significant role in this context. The econometric findings obtained in this study show that the level of openness, which varies from country to country, is a deciding factor behind the effectiveness of the remittances in promoting growth (see Section 4.2 also). To the best of my knowledge, there exists virtually no study which tries to assess whether openness influences the growth effects of the remittance flows. This paper attempts to extend the literature in this direction by assessing the relationship between remittances and economic growth for a sample of 62 developing countries during the time period 1990–2014.

The rest of the paper is structured as follows. The next section discusses the hypothetical channels through which remittances may affect growth. A review of the relevant literature has been presented in Section 3. Section 4 discusses the methodology and data used in this study. Section 5 presents and interprets the econometric findings. Finally, Section 6 concludes.

2 Remittances and Economic Growth: Theory

Within a "growth accounting framework", there are three channels through which remittances can affect growth (Barajas et al. 2009).

i) **Physical and human capital accumulation**: Remittances can act as an alternative source of finance for funding investment in capital goods, besides the domestic financial sector. If there are significant credit con-

straints in the remitter's home country which may not be too uncommon in many developing countries, then remittances can significantly increase the ability of the remittance-receiving households to finance investments and thus aid in physical capital accumulation. Access to remittance inflows may also increase the creditworthiness of the recipient households and make access to domestic credit easier for them which will also increase the capital accumulation rate through increased investments. Another mechanism through which remittances can increase capital accumulation is through their effects on macroeconomic stability. If remittances make the domestic economy less volatile against external shocks then that will improve the investment climate leading to more domestic investments by firms. Using a sample of 70 remittance-receiving countries, Chami, Hakura, and Montiel (2009)show that remittances do reduce output volatility.

As mentioned previously, remittances also enable recipient households to invest in education. This should have positive spillover effects. For instance, a rise in the education level of the population increases the human capital stock of the country which, in turn, influences innovation and technological advancement and positively affects growth.

ii) **Total Factor Productivity (TFP) growth**: The effect of remittances on TFP growth is slightly ambiguous. Remittances may lead to an increase in the volume of funds flowing through the domestic banking system. In that case, the capability of the banking sector to allocate capital can go up resulting in more efficient investments. However, inflow of remittances can also lead to an appreciation of the real exchange rate which will hurt exports. This implies a potential for Dutch disease effects. Such effects would materialise if exchange rate appreciation results in the contraction of sectors of production that generate dynamic production externalities (Barajas et al. 2009). Thus, the effect of remittances on economic growth through this channel can be both positive or negative.

iii) **Labour force growth**: Another channel through which remittances may impact growth is through labour force participation. Remittance receipts could be expected to have a negative impact on participation rates because it may induce household members to treat the remittance money as a substitute for labour income. There is a significant chance of moral hazard problem in this regard as the recipient may divert the remittance income towards consumption of leisure without the knowledge of the remitter because of the distance between the two. Sindhu (2007) and Balasubramanyam and Balasubramanyam (2015)talk about the problem of backward-bending supply curve in the Indian state of Kerala where the tendency to substitute work for leisure is higher in households receiving remittances than households without remittances. Kozel and Alderman (1990)studied labour force participation and labour supply in Pakistan and found a significant negative impact of remittances on the labour force participation of males.

The discussion above gives a notion that the theoretical effect of remittances on growth is ambiguous. It can be either positive or negative, depending on which channel is dominant.

3 Review of the Literature

There exists a considerably large literature which tries to investigate the growth effects of remittances. The literature can be broadly classified into two groups: (a) time series studies exploring the aforementioned relationship for a specific country and (b) panel studies doing the same for a group of developing countries. Given the scope of the paper, we only focus on studies belonging to the latter category.

Overall, the empirical evidence on the relationship between remittances and economic growth is mixed. Using a panel dataset on 114 countries for the time period 1991–2003, Catrinescu et al. (2006)find a positive remittance-growth nexus. However, they report that the relationship is not very robust. Pradhan, Upadhyay, and Upadhyaya (2008)examine the same in a sample of 39 developing countries using panel data from 1980–2004. The study estimates a standard growth model and finds that remittances affect growth positively. Using panel data from 1980 to 2005, Fayissa and Nsiah (2010)examine the aggregate impact of remittances on the economic growth of 17 Latin American countries within the conventional neoclassical growth model. They find that remittances have a positive and statistically significant impact on both the current level of gross domestic product and the economic growth rate of Latin American countries. Using panel data on 31 developing countries from Latin America, Caribbean and Sub-Saharan Africa from 1996–2006, Ahortor and Adenutsi (2009)report that the overall effect of remittances on economic growth is positive.

However, these findings have been challenged by another set of studies who report a negative or a non-existent relationship between remittances and growth. For instance, Chami, Fullenkamp, and Jahjah (2003)estimate the growth effects of workers' remittances using panel data on 83 countries during the time period 1970–1998 and conclude that remittances have a negative effect on economic growth. They cite the moral hazard problem as a significant factor behind this negative impact. Using a cross-country growth regression framework, Spatafora (2005)shows that there is no statistically significant relation between real per capita out-

put growth and remittances. Barajas et al. (2009)examine the empirical relationship between remittances and growth using panel growth regressions on a sample of 84 recipient countries for the 1970–2004 period. They find that remittances have contributed little to economic growth and may have even retarded growth in some. Nwaogu and Ryan (2015)estimate how foreign direct investment (FDI), foreign aid and remittances impact the economic growth of 53 African and 34 Latin American and Caribbean countries using a dynamic special framework. They find that remittances do not affect growth in the African countries and that, in case of the Latin American and Caribbean countries, the relationship between remittances and growth is positive but fragile and sensitive to model specifications.

4 Methodology and Data

4.1 Estimation of the full sample

The remittances-economic growth relationship has been initially estimated by an augmented version of the Balasubramanyam, Salisu, and Sapsford (1996)model. It is a conventional growth equation which, after the inclusion of a remittance variable, looks as follows:

$$GDP_{it} = \beta_0 + \beta_1 Remittance_{it} + \beta_2 I/GDP_{it} + \beta_3 Export_{it} + \beta_4 Labour_{it} + e_{it} \quad (1)$$

where, in country 'i' and at time 't', 'GDP' is growth rate of GDP (constant 2005 US$), 'Remittance' denotes total remittances expressed as % of GDP, 'I/GDP' is gross domestic investments expressed as % of GDP, 'Export' is growth rate of exports (constant 2005 US$), 'Labour' represents growth rate of the labour force and 'e' is the error term. A time trend has also been included in all the estimating regressions. All variables are expressed in their natural logarithms. I take exports and labour in their first differences (growth rate) and not in levels to eliminate any potential bias emerging from non-stationarity. Remittances and investment has been taken in levels because the value of these variables always lie between 0 and 1 as they are expressed as percentage of GDP. Therefore, it can be argued that these variables are potentially I(0). Data on all the variables used in this study have been obtained from the World Bank (2015) World Development Indicators database.

I initially estimate eq. 1for a panel consisting of all the 62 countries in the sample (see Table 10 for a full list of the countries) and find that remittances have no effect on growth (results are presented in the succeeding section). Next, the variable, 'Remittances' is dropped from the model and an interaction term of the Remittances and trade openness (Rtrade) has been introduced.

$$GDP_{it} = \beta_0 + \beta_1 Rtrade_{it} + \beta_2 I/GDP_{it} + \beta_3 exports_{it} + \beta_4 labour_{it} + e_{it} \quad (2)$$

The hypothesis that I test here is that growth effects of remittances increase in more open economies.

Remittances do not necessarily lead to long term business investments because remittance-receiving households generally spend the received money on consumption or 'consumptive' investments, such as, food and health (Lubambu 2014). In other words, the households have two choices: either they spend on consumption goods or on capital goods. Needless to say, the higher the percentage of remittances spent on the latter, the more pronounced would be the growth-enhancing impact of the remittances. The factors which dictate the pattern of allocation of the remittances income are the following:

i) **Level of poverty**: If the country has a high level of poverty, naturally the households who receive remittances will end up using most of the received money on basic goods such as food, clothing and medicine and will rarely allocate anything for investment purposes.

ii) **Development of financial markets**: In those countries where access to industrial credit is limited because the financial market is underdeveloped, the growth-effects of remittances will be much less pronounced. If the financial market is well-developed, then people tend to save more with financial institutions which, in turn, will transform these savings into profitable investments. Eventually, this will boost the economic growth of the country. If the remittances recipient is not willing to undertake any entrepreneurial activity, but rather save, even then a well-functioning financial market can mobilise those savings into investments. Thus, remittances can be expected to increase investments in a country with efficient financial markets (Fajnzylber and Lopez 2008)

iii) **Quality of institutions**: Inefficient domestic institutions may lead to a variety of problems like widespread corruption, "red-tape" and lack of transparency of rule of law. All these factors adversely affect the business climate in the economy and therefore discourage investments. For instance, if institutions are weak, government officials might engage in rent-seeking activities which can prove to be damaging for economic development (Shleifer and Vishny 1993; Tanzi 1998). In such cases, even if remittances receivers have the will and the resources to invest they will not do so because of the aforementioned factors.

There is a large literature which says that openness plays a significant role in mitigating the problems of inefficient financial and political institutions. In other words, the more open the economies, the more developed the financial markets and domestic institutions are (see, for instance, Demetriades and Law 2006; Baltagi, Demetriades, and Law 2007; David, Mlachila, and Moheeput 2014, among others). If that is the case, then the coefficient on 'Rtrade' in eq. 2can be expected to be positive and statistically significant.

4.2 Classification of Countries on the Basis of 'Openness'

Next, I classify the countries in my sample into 'more open' and 'less open' economies and estimate eq. 1for each of the groups. If openness does lead to the development of efficient institutions and financial markets, then the growth-enhancing effects of remittances should be larger in the sample of 'more open' countries.

However, prior to this exercise, we need to define 'openness'. There is no clear consensus on how to define openness because of its multi-dimensional nature. Consequently, to capture different aspects of 'openness', multiple proxies for the same have been used so that it can be ensured that the findings of this paper are robust and not sensitive to how we define 'openness'.

Countries have been assigned to 'less open' or 'more open' group using the following 4 criteria:

1) **Trade volume**: One of the most common measures of openness of a country is the volume of trade that the country does with the rest of the world. Therefore, I use export openness (Export/GDP, where exports as percentage of GDP), import penetration ratio (Import/GDP, imports as percentage of GDP) and total trade as percentage of GDP (Trade/GDP) as the three criteria under 'trade volume'. The higher the value of any of these measures, the more open the country is.

There is a no clearly defined threshold of trade openness which helps in identifying open or closed economies. Hence, I work here with the concept of relative openness. For each measure, those countries which are above the mean openness of all the countries in my sample in 2014 have been classified as 'more open' and those below the mean are defined as 'less-open'.[1] Out of the 62 countries in my sample, number of 'more open' countries are 25, 27 and 26 as per the export, import and trade criteria respectively. Overall, the three lists are almost identical with only 4 countries switching groups when we move from the trade/GDP to export/GDP criteria (Azerbaijan, Costa Rica, Ghana and Tajikistan) and only 3 countries when we do the same from total trade to import penetration ratio (Bolivia, Haiti and Senegal).

2) **Trade barrier**: An open country should encourage more trade and, subsequently, should have lower tariffs on its imports compared to comparatively less open or more protected economies. Hence, if the tariff rate (applied, weighted mean, all products, %) in a particular country is less than the mean tariff rate of the sample then it has been classified as an open country and vice versa. According to this criterion, 34 countries have been categorised as 'more open'.

3) **Foreign Direct Investment (FDI)**: Next, I use the volume of FDI (as percentage of GDP) as a condition for openness. The reason being more open countries are less protective of their domestic industries and encourage foreign investors and multinational corporations to come into the domestic economy and invest. Like in the case of trade volume, a country with FDI/GDP ratio higher than the mean FDI/GDP ratio of the sample has been classified as 'more open'. According to FDI/GDP, only 23 countries come out to be 'open'.

4) **Exchange rate distortions**: The final criteria used to define 'openness' is exchange rate distortion, defined as, price level ratio of purchasing power parity (PPP) conversion factor (GDP) to market exchange rate. In absence of any distortion the ratio will be 1. The closer the value of this ratio to 1, the less the distortion is. For none of the developing countries in the sample, the ratio is 1 or even close to 1 suggesting that there are some exchange rate distortions in all those economies resulting from government intervention. As per this criterion (mean ratio was 0.45 in 2014), it is found that 38 countries can be classified to be as 'more open' economies.

Not surprisingly, the number of countries, classified as 'more open' or 'less open', varies significantly across different indicators of openness. Table 1presents the top receivers of remittances among developing countries in 2014. India tops the chart with an annual receipt of 70.4 billion current US dollars in 2014 followed by China and Philippines. Most of the South Asian countries (India, Pakistan, Bangladesh and Sri Lanka) feature amongst the top receivers.

Table 1: Top remittance receiving developing countries, 2014.

Country	Personal remittances, received (current US$)
India	70.4
China	29.9
Philippines	28.4
Mexico	24.5

Nigeria	20.8
Egypt	19.6
Pakistan	17.1
Bangladesh	15.0
Indonesia	8.6
Lebanon	7.4
Sri Lanka	7.0

* Source: World Bank (2015).

Out of the top 11 receivers, 6 countries namely India, Nigeria, Egypt, Pakistan, Bangladesh and Sri Lanka fall into the category of 'less open' regardless of which criterion we select. China, Mexico, Philippines and Indonesia fall in, what I call, the 'grey' area. In other words, these four countries can be classified as both 'more open' or 'less open' depending on which criterion we choose to consider. For instance, China falls in the group of 'more open' if we define 'openness' by tariff barrier or exchange rate distortions but gets classified as 'less open' if we look at FDI or trade volume. Among the rest of the countries in the sample, some of the African countries such as Rwanda, Madagascar, Cameroon, Ethiopia, Mali, Kenya, Guinea-Bissau almost always came out to be 'less open'. On the other hand, countries such as Albania, Georgia, Jordan, Macedonia, Malaysia and Moldova always came out to be 'more open'.

In the next section, the econometric findings are presented. The model has been initially estimated by employing Pooled OLS and Fixed effects model techniques (Hausman test ruled in favour of Fixed effects estimation). In case there is the problem of autocorrelation, Feasible Generalized Least Squares (FGLS) method has been applied. Furthermore, endogeneity can potentially be a serious issue in the estimation of such growth models. There is ample empirical evidence of reverse causality from GDP towards trade and investment (see, for example, Anwer and Sampath 1999; Tsen 2006; Chatterji, Mohan, and Ghosh Dastidar 2014). Hypothetically speaking, there can be reverse causality from GDP towards remittances too. For instance, as the economy of the home country grows, its financial sector develops and thus it becomes easier to remit money back home. On the other hand, slower economic growth can lead to higher outward migration and higher remittances consequently. Slower growth can also make altruistic migrants remit more money back home to help family members cope with economic hardship. (Barajas et al. 2009). If endogeneity is detected, Instrumental Variable (IV) GMM approach has been applied to rectify the problem.

5 Results

Table 2presents the estimation results of eqs 1and 2for all the countries in the sample for the time period 1990–2014.

Table 2: Regression results, 1990–2014.

Independ ent variable	**1) Pooled OLS (I)**	**Equation (1) FEM (II)**	**Equation (1) GMM (III)**	**2) GMM (IV)**
Remittance	0.001	0.005	0.000	
Rtrade				0.002*
I/GDP	0.023*	0.025*	0.019*	0.011*
Export	0.164*	0.153*	0.240*	0.171*
Labour	0.203*	0.157	0.290*	0.181*
Constant	−0.051*	−0.055*	−0.017	−0.015
R^2	0.26	0.24	0.28	0.24
No. of countries	62	62	62	62
Hausman Test		P-value = 0.00	P-value = 0.34	P-value = 0.36
Wooldridge Test		P-value = 0.25		
Hansen J statistic				

* Note: The dependent variable is GDP growth (GDP_{it}). *,** and *** denote statistical significance at 10 %,5 % and 1 % respectively. Heteroskedasticity-robust standard errors have been used. All regressions include a time trend. The mean variance inflation factor (vif) value is considerably lower than 10 (1.05) in each of the regressions which confirms absence of any serious multicollinearity.

When estimated for the full sample, remittances (expressed as percentage of GDP) have no impact on GDP growth. This finding is robust across all the estimation methods- Pooled OLS, FEM and IV GMM. However, the interaction term of remittances and trade in eq. 2(Column IV) comes out to be positive and statistically

significant which implies that as the openness of the countries go up the growth effects of remittances start to increase. As discussed in Section 4.1, this finding is expected since as a country becomes more open, the domestic institutions and financial markets start to develop and this, in turn, will enhance the growth-enhancing impact of remittances in two ways: firstly, as domestic institutions improve with increasing openness, incidence of rent seeking activities and corruption starts to decline which creates a business-friendly environment and boosts investor confidence in the local economy. As a result, higher proportion of remittances are invested in capital goods and consequently economic growth rate rises. Secondly, as financial market develops, access to banks go up and, as a result, remitters' family can deposit the remittances money as savings which then gets channelised into profitable investments.

Other variables such as exports growth and investments (I/GDP) come out to be significant determinants of growth and these findings are robust across different model specifications. In fact, the magnitude of the effect of these conventional sources of growth outweighs that of remittances considerably. The Wooldridge test for autocorrelation confirms that our FEM estimates do not suffer from any autocorrelation bias. However, both Wu-Hausman F test and Durbin-Wu-Hausman chi-square test reject the null of exogeneity (p-value = 0.00, where the null hypothesis is that the concerned regressor is exogenous) for investments. Therefore, I use first and second year lagged values of I/GDP as instruments and re-estimate eq. 1using IV GMM approach. The new findings (presented in Columns III) are largely unchanged except the coefficient on the labour force growth becomes significant.

Next, I categorise the countries into 'more open' and 'less open' groups based on the level of openness and re-estimate eq. (1).[2] Table 3–Table 5below present the regression results for the 3 trade volume measures.

Table 3: Regression results based on Export/GDP criterion, 1990–2014.

Independent variable	LO_FEM	LO_GMM	MO_FEM	MO_GMM
Remittance	−0.009*	−0.001	0.011*	0.003*
I/GDP	0.019*	0.004	0.027*	0.024*
Export	0.137*	0.163*	0.175*	0.197*
Labour	0.199	−0.021	0.085	0.274*
Constant	−0.039	0.011	−0.059*	−0.060*
R^2	0.15	0.20	0.28	0.34
No. of countries	37	37	25	25
Hansen J Test Wooldridge Test	P-value = 0.22	P-value = 0.38	P-value = 0.79	P-value = 0.33

* Note: The dependent variable is GDP growth (GDP_{it}).*,** and *** denote statistical significance at 10 %, 5 % and 1 % respectively. Heteroskedasticity-robust standard errors have been used. All regressions include a time trend. 'LO' and 'MO' stand for less open and more open country groups respectively. The mean variance inflation factor (vif) value is considerably lower than 10 (1.07 and 1.11 for the LO and MO regressions respectively). First and second year lagged values of I/GDP have been used to instrument I/GDP in the GMM estimation.

Table 4: Regression results based on Import/GDP criterion, 1990–2014.

Independent variable	LO_FEM	LO_GMM	MO_FEM	MO_GMM
Remittance	−0.003	−0.000	0.011*	0.004*
I/GDP	0.023*	0.012*	0.025*	0.017*
Export	0.162*	0.170*	0.160*	0.154*
Labour	0.309	0.117	−0.054	0.112
Constant	−0.058	−0.021	−0.051*	−0.030
R^2	0.26	0.28	0.20	0.24
No. of countries	35	35	27	27
Hansen J Test Wooldridge Test	P-value = 0.22	P-value = 0.81	P-value = 0.76	P-value = 0.13

* Note: The dependent variable is GDP growth (GDP_{it}).*,** and *** denote statistical significance at 10 %,5 % and 1 % respectively. Heteroskedasticity-robust standard errors have been used. All regressions include a time trend. First and second year lagged values of I/GDP of remittances have been used to instrument I/GDP and remittances respectively in the GMM estimation.

Table 5: Regression results based on Trade/GDP criterion, 1990–2014.

Independent variable	LO_FEM	LO_GMM	MO_FEM	MO_GMM
Remittance	−0.004	−0.001	0.010*	0.004*
I/GDP	0.022*	0.011	0.026*	0.017*
Export	0.151*	0.170*	0.158*	0.169*
Labour	0.203	0.038	0.074	0.243*
Constant	−0.049	−0.010	−0.056*	−0.039
R^2	0.22	0.24	0.29	0.30
No. of countries	36	36	26	26
Hansen J Test	P-value = 0.19	P-value = 0.81	P-value = 0.87	P-value = 0.17
Wooldridge Test				

* Note: The dependent variable is GDP growth (GDP_{it}). *, ** and *** denote statistical significance at 10 %, 5 % and 1 % respectively. Heteroskedasticity-robust standard errors have been used. All regressions include a time trend. First and second year lagged values of I/GDP have been used to instrument I/GDP in the GMM estimation.

In each case, investment came out to be endogenous whereas remittances came out to be endogenous for the 'less open' country group in the case of Import/GDP (P-value = 0.00, Wu-Hausman F test and Durbin-Wu-Hausman chi-square test). Hansen J test signifies that the instruments used in the GMM estimation are valid and none of the models seem to suffer from autocorrelation bias. As far as the impact of remittances is concerned, results are pretty similar across the three estimations. Remittances seem to affect growth positively in the 'more open' countries and this result is robust across different estimation methods and different trade volume indicators. Conversely, the effect of remittances is statistically insignificant and fragile for the 'less open' groups; sometimes the coefficient on this variable even takes a negative value. Table 6–Table 8present the econometric findings when we use FDI, trade barrier and exchange rate distortions as the openness indicator respectively.

Table 6: Regression results based on FDI/GDP criterion, 1990–2014.

Independent variable	LO_FEM	LO_GMM	MO_FEM
Remittance	0.000	0.003*	0.010*
I/GDP	0.021*	0.009	0.016
Export	0.154*	0.171	0.144*
Labour	0.162	0.408	0.150
Constant	−0.049	0.002	−0.029
R^2	0.20	0.14	0.34
No. of countries	39	39	23
Hansen J Test	P-value = 0.22	P-value = 0.25	P-value = 0.79
Wooldridge Test			

* Note: The dependent variable is GDP growth (GDP_{it}). *, ** and *** denote statistical significance at 10 %, 5 % and 1 % respectively. Heteroskedasticity-robust standard errors have been used. All regressions include a time trend. First and second year lagged values of I/GDP have been used to instrument I/GDP in the GMM estimation.

Table 7: Regression results based on trade barrier criterion, 1990–2014.

Independent variable	LO_FEM	MO_FEM	MO_FGLS
Remittance	**0.001**	**0.007***	**0.002***
I/GDP	0.017*	0.034*	0.036*
Export	0.135*	0.174*	0.189*
Labour	0.493	−0.029	0.154*
Constant	−0.043*	0.076*	−0.09*
R^2	0.23	0.29	
No. of countries	28	34	34
Wooldridge Test	P-value = 0.64	P-value = 0.15	

* Note: The dependent variable is GDP growth (GDP_{it}). *, ** and *** denote statistical significance at 10 %, 5 % and 1 % respectively. Heteroskedasticity-robust standard errors have been used. All regressions include a time trend.

Table 8: Regression results based on exchange rate distortions criterion, 1990–2014.

Independent variable	LO_FEM	MO_FEM
Remittance	0.003	0.005*
I/GDP	0.020*	0.028*
Export	0.165*	0.134*
Labour	0.645*	−0.235*
Constant	−0.06*	−0.056
R^2	0.32	0.15
No. of countries	24	38
Wooldridge Test	P-value = 0.82	P-value = 0.62

* Note: The dependent variable is GDP growth (GDP_{it}). *, ** and *** denote statistical significance at 10 %, 5 % and 1 % respectively. Heteroskedasticity-robust standard errors have been used. All regressions include a time trend.

In the regression results based on FDI criterion, a joint endogeneity test for export, remittances and investment denotes that the model with 'more open' countries do not suffer from any endogeneity (P-value = 0.38). However, investment is endogenous in the equation with the 'less open' countries. The final two models (see Table 7and Table 8) do not suffer from any endogeneity bias.[2] When we take FDI/GDP as the openness proxy, remittances received by the 'less-open' countries display some statistically significant growth effects but it should be noted that the magnitude of the effect (0.003) is still smaller compared to that in the case of the 'more open' countries (0.010). The effect, however, disappears again when we switch to other openness indicators such as trade barrier and exchange rate distortions. The results again strongly support the hypothesis that growth effects of remittances are more pronounced in the case of 'more open' countries.

It can also probably be asserted that quantity or amount of remittances does not matter-as far as economic growth is concerned. The results indicate that the growth effects of remittances are likely to be most pronounced in the small open economies. Most of the highest remittance receivers, such as India, Egypt, Pakistan, Nigeria, Bangladesh and Sri Lanka, predominantly feature in the 'less open' groups. Philippines and Indonesia, also amongst the top 10 remittance receivers, also came out to be 'less open', apart from when we use trade barrier as the criterion for openness. Even, China appears in the 'less open' group when we consider trade volumes as an indicator of openness. Lebanon is the only country (among the top 10 receivers) to be always classified as 'more open'.

As discussed earlier, for remittances to lead to economic growth, the following channels are necessary: developed financial markets, efficient domestic institutions, low poverty level and high Human Development Index (HDI). Table 9below compares a variety of financial, institutional and poverty/HDI indicators across 3 groups of countries. The first group of countries (more open) are those countries in my sample which have always come out to be 'more open' regardless of the way we define 'openness'. The second category of countries (those in the 'grey' area) are those which came out to be both 'more open' and 'less open' depending on the way we define 'openness'. Finally, the third category includes those countries who are some of the highest recipients of remittances in the developing world and have always featured in the 'less open' list.

Table 9: Financial, Institutional and Poverty/HDI: 'More open' vs 'Less open' countries.

Country	Financial indicators				Institutional quality				Poverty/HDI	
	CII*	Domestic credit by financial sector (% of GDP)	Domestic credit to private sector (% of GDP)	Borrowers from commercial banks (per 1,000 adults)	Corruption Perception Index*	Government Effectiveness	Regulatory Quality	Rule of law	Poverty gap at $1.90 a day (2011 PPP) (%)	Human development Index
More open countries										
Albania	6	68.1	37.6	155.4	33	−0.7	0.23	−0.37	0.22	0.73
Georgia	8	48.5	45.2	590.3	52	0.48	0.93	0.2	3.36	0.75
Jordan	0	–	70.2	–	49	0.13	0.08	0.48	0.03	0.75
Lebanon	6	–	103.3	294.3	27	−0.38	−0.22	−0.76	–	0.77

Macedonia, FYR	7	49.9	49.6	319.4	45	0.15	0.47	−0.03	0.3	0.75
Malaysia	7	140.5	120.6	392	52	1.14	0.84	0.64	0.04	0.78
Moldova	6	38.9	37.1	52.1	35	−0.38	0.02	−0.27	0.01	0.69
Nicaragua	8	47.2	34.1	–	28	−0.83	−0.38	−0.67	3.62	0.63
Average	**6**	**65.5**	**62.2**	**300.6**	**40.1**	**−0.05**	**0.25**	**−0.1**	**1.1**	**0.73**
Countries in the "grey" area										
China	6	169.2	141.8	317.9	36	0.34	−0.27	−0.33	2.66	0.73
Mexico	8	50.3	31.1	228.6	35	0.19	0.43	−0.45	0.67	0.76
Indonesia	6	43.5	36.5	397.3	34	−0.01	−0.1	−0.35	2.89	0.68
Philippines	5	55.8	39.2	–	38	0.19	−0.01	−0.33	2.74	0.67
Average	**6.25**	**79.7**	**62.1**	**314.6**	**35.8**	**0.1**	**0.01**	**−0.37**	**2.24**	**0.71**
Less open countries										
India	7	74.7	51.1	200	38	−0.2	−0.45	−0.09	4.2	0.61
Pakistan	3	47.5	15.6	23.3	29	−0.75	−0.69	−0.78	1.1	0.54
Bangladesh	0	58.6	42.4	81.3	25	−0.77	−0.94	−0.72	11	0.57
Egypt, Arab Rep.	8	92.8	27.3	105.1	37	−0.82	−0.75	−0.6	–	0.69
Nigeria	6	21.6	14.6	30.8	27	−1.19	−0.82	−1.08	21	0.51
Sri Lanka	6	45.3	28.2	–	38	0.09	−0.08	−0.15	0.26	0.76
Average	**5**	**56.75**	**29.9**	**88.1**	**32.3**	**−0.61**	**−0.66**	**−0.57**	**7.5**	**0.61**

* Source: Data on corruption has been obtained from Transparency International. Data on the rest of the variables are from WDI, 2015. '–' denotes missing data.
Note: CII=credit information index measures rules affecting the scope, accessibility, and quality of credit information available through public or private credit registries. The index ranges from 0 to 8, with higher values indicating the availability of more credit information, from either a public registry or a private bureau, to facilitate lending decisions. **Corruption Perception index by Transparency International-100 (very clean) to 0 (highly corrupt).

Table 10: Countries in the sample.

Less open	More open
Argentina	Albania
Armenia	Azerbaijan
Bangladesh	Belarus
Benin	Belize
Brazil	Bolivia
Cameroon	Botswana
China	Bulgaria
Colombia	Cambodia
Dominican Republic	Costa Rica
Ecuador	Georgia
Egypt, Arab Rep.	Honduras
El Salvador	Jordan
Ethiopia	Kyrgyz Republic
Ghana	Lebanon
Guatemala	Macedonia, FYR
Guinea-Bissau	Malaysia
Haiti	Moldova
India	Nicaragua
Indonesia	Paraguay
Kenya	Romania
Madagascar	Sierra Leone

Mali	Thailand
Mexico	Togo
Morocco	Tunisia
Mozambique	Ukraine
Niger	
Nigeria	
Pakistan	
Peru	
Philippines	
Rwanda	
Senegal	
South Africa	
Sri Lanka	
Tajikistan	
Tanzania	
Uganda	

[1] Note: Classification of the countries in the sample into "more-open" and "less-open" categories according to the export openness criterion.

'More open' countries score better in each and every indicator than the 'less-open' economies. The former has much more developed financial markets, more efficient institutions, lower incidence of corruption and better legal systems. For instance, domestic credit given to the private sector and borrowers from commercial banks per 1000 adults in the 'more open' economies are 62.2 % of GDP and 300.6 compared to an abysmal 29.9 % of GDP and 88.1 in less open economies hinting towards the presence of a larger financial sector in the former countries. Similarly, 'more open' economies score higher in government effectiveness (−0.5 vs −0.61), have better regulatory qualities (0.25 vs −0.66) and subsequently experience less corruption (40.1 vs 32.3). Even, the countries in the middle or 'grey' area perform better in all aspects as compared to the 'less open' countries. The picture is slightly mixed when we compare the 'more open' countries with those in the middle. For instance, the latter group (China, Mexico, Indonesia and Philippines) probably have more developed financial markets than the 'more open' developing countries. But the more open economies have better institutions, lower poverty level and better human development.

Finally, countries such as China and India, the largest remittance receivers in the world, started adopting liberalisation measures since the 1980s and 1990s respectively but probably they are still relatively less open than the small open economies. Same argument can be applied for the other big remittance receiving countries such as Philippines. One future area of investigation could be to check whether the growth effects of remittances differ in these large remittance receiving countries across the pre and post liberalisation periods. There is another possibility that remittances lead to economic development (such as, improvement in education and health indicators) in the short run and the effect on economic growth is only felt in the long run in these large economies. This can be another topic for future research.

6 Conclusion

The paper examines the empirical relationship between remittances and economic growth for a sample of 62 countries over the time period 1990–2014. The econometric findings indicate that, when estimated for all the countries in the sample, there is no evidence of a significant relationship between remittances and growth. Remittances only seem to promote growth in the 'more open' economies. The study uses a variety of indicators of 'openness' and tests the proposition that openness of a country increases the growth effects of remittances. The finding, that remittances lead to higher growth in open economies, is robust regardless of how 'openness' is defined. Conversely, no significant effect of remittances on growth could be detected in the case of 'less open' countries. That is because remittances are in themselves not sufficient for growth. The extent of the benefit depends on domestic institutions and macroeconomic environment. Unlike the 'less open' countries, 'more open' countries have better institutions and better financial markets to take advantage of the remittances income and channelise them into profitable investments which, in turn, accelerates the rate of economic growth in these countries.

However, the results obtained in this study also indicate that conventional sources of growth, like investments and international trade, have much larger growth effects as compared to the remittances. So, the policymakers in the developing countries should not treat remittances as an alternative to these factors and pursue appropriate policies to increase investments and trade in their countries to promote faster growth.

Notes

[1]The lists of 'more open' and 'less open' countries according to each openness criterion have not been included in the paper. They will be available upon request.

[2]I re-estimate the model for 'more open' countries with FGLS method in case of trade barrier criterion because I fail to reject the null of 'no autocorrelation' marginally. Overall the results do not change much; only the magnitude of the coefficient on remittances goes down.

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