# Do Workers' Remittances Cause Growth in Developing Countries?

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## Abstract

The dominant view in the empirical literature is that workers' remittances decrease growth in developing countries. However, anecdotal evidence seems to contradict this perspective. This paper therefore re-investigates the effect of workers' remittances on real per capita output growth in developing countries. By addressing important shortcomings that render the current literature inconclusive, and utilizing static and dynamic panel data techniques, it provides a broader and more conclusive empirical treatment of the remittance-growth relationship. Two main results are contributed. First, remittances cause significant positive growth in developing countries. Second, controlling for weather was necessary to uncover this positive relationship and provide consensus between the two empirical approaches adopted. Apart from challenging the currently held view, these results suggest that policymakers should actively encourage remittance inflows.

## 1. Introduction

In the empirical macroeconomics literature investigating the effect of remittances on growth across groups of developing countries, the prevailing view is that remittances decrease growth. However, potentially significant methodological shortcomings in the dominant paper reduce the credibility of these conclusions. The nature and size of this remittance-growth relationship therefore remain open questions. This paper seeks to address this gap in the literature. As our primary objective, we empirically re-assess the effect of workers' remittances on output growth in a panel of developing countries using what we regard as a more thorough and appropriate empirical framework, in addition to utilizing a longer and more recent dataset. As a brief preview of our results, we find a robust positive remittance-growth relationship in contrast to the currently accepted view.

Among the international capital flows to developing countries, workers' remittances have emerged over the last two decades as a prominent and unique source of external finance. From a global perspective, official remittance inflows in 2007 to developing countries (US$214 billion) were second only to foreign direct investment (US$400 billion) and much larger than official development assistance and official aid combined (US$79 billion). This point is echoed more generally in Figure 1 which shows that this pattern has been consistent since the mid-nineties. Figure 2 makes the point that the same ordinal ranking exists even when looking at the annual growth rates of all three inflows since the mid-nineties. Collectively, these pictures reinforce that the sheer magnitude and persistence of remittances make them an important global capital flow to developing countries. From an individual country perspective for 2007, the top twenty recipient developing countries had remittance-to-GDP ratios ranging from 10% to 45%, with the average across all developing countries being 6%. Additionally, remittance inflows have also established themselves as a more resilient source of external finance for developing countries. Figure 2 and Figure 3 both provide evidence that compared to foreign direct investment (FDI) and combined official development assistance and official aid (ODAOA), remittances were much less volatile over the period 1989-2007.

The primary questions of the nature and size of the remittance-growth relationship addressed by this paper are therefore important given the facts above. Remittances have the

potential to significantly influence developing economies, and perhaps in very different ways as compared to other major international capital inflows previously studied in detail. Accurate answers to both these questions are of immediate relevance to policymakers in developing countries since they dictate the type and magnitude of policy response needed. If remittances are positively influencing growth, the task of policymakers becomes finding ways to promote this inflow and magnify its effect on growth both in the short and long term. However, if remittances are in fact decreasing output growth, their immediate task would be to stabilize their negative effects and then determine how to re-channel them in the medium to long term such that they become less welfare-reducing.

What makes an empirical approach to these primary questions particularly important is that the related theoretical literature cannot provide a definitive answer on the overall nature of the existing remittance-growth relationship. Theoretically, remittances can have positive or negative effects on output growth in developing countries. On the positive side, one dominant theory asserts that remittances may finance greater private physical or human capital investment by reducing credit constraints of households traditionally excluded from credit markets. Another suggests that remittances may increase the supply of funds to the domestic banking system by increasing spending and transactions demand for money among households, and consequently lead to financial sector development through a reduction in intermediation costs. On the negative side, remittances may have Dutch Disease effects in economies with pre-existing distortions between the tradeable and non-tradeable sectors, leading to diminished growth. Hence, the theoretical literature by itself cannot provide consensus on the effect of remittances on growth in developing countries. As such, the responsibility of delineating among the many remittance-growth theories to provide definitive answers on the dominant nature and size of this relationship lies entirely on appropriate empirical investigations.

This paper contributes to the existing literature in two main ways: it first identifies and then empirically addresses critical shortcomings that render the current empirical literature inconclusive (specifically, inadequate treatment of possible revere causality and omitted variable bias). It also employs a more diverse range of empirical panel techniques to provide a robust empirical framework. Two main results are obtained: first, remittances increase output growth in

developing countries; second, controlling for weather was necessary to uncover this positive relationship and provide consensus among the two empirical approaches adopted.

The paper proceeds as follows. Section 2 discusses the difficulties associated with estimation of the exogenous remittance-growth relationship. Section 3 provides a critical analysis of the most important related literature, Section 4 offers a description of the data and its sources, Section 5 outlines the empirical strategies employed, Section 6 discusses the results obtained and Section 7 adds concluding remarks.

**2. Remittances Theory and Empirical Challenges**

2.1 Definition of remittances: Misspecification

One of the challenges faced in studying the remittance-growth relationship is the lack of consensus on what constitutes a remittance. Consequently, different data sources define and measure the 'remittances' variable in one of two different ways. The first is the one used by the International Monetary Fund (IMF) which reports the variable 'workers' remittances' and defines it as "the current private transfers from migrant workers who are considered residents of the host country to recipients in the workers' country of origin" (Balance of Payments Manual, 6th Edition - BPM6). Migrants are considered as individuals who "live in the host country for one year or longer" (BPM6). The second definition comes from the World Bank which reports 'migrants' remittances' and defines it as the sum of 'workers' remittances' (as defined earlier), 'compensation of employees' ("private transfers from non-residents to recipients in the country of origin," BPM6) and 'migrant transfers' ("changes in the financial items that arise from migration of individuals from one economy to another," BPM6).

As highlighted by Chami et al (2008), the Reinke report (2007) indicates that the G8, United Nations, IMF and World Bank view the first measure as a more accurate representation of remittances over the second and as such, the IMF will continue to include it in their Balance of Payments compilation methodology. However, the component 'migrant transfers' will no longer

be reported while 'compensation of employees' will assume a supplementary role. Hence, 'workers' remittances' should be used as the measure of remittances in empirical studies, including the OLS estimation equation above, to avoid an inclusion of irrelevant variables problem that would result in biased estimates and misleading conclusions.

2.2 Reverse causality

Assumptions about the direction of causality between remittances and growth are another potential source of error in estimating the effect of remittances on growth, and these assumptions are directly related to the determinants of remittances. However, just as the theoretical literature is unable to decide upon the dominant remittance-growth relationship among developing countries, so too is it unable to determine the prevailing determinants driving remittance flows.

On one hand, consider remittances that are altruistically motivated and used for consumption purposes. These remittances may positively affect growth through financial sector development, as described in the introduction, but remain independent of growth in the recipient country because their altruistic nature. In such a case, and assuming the other classical linear regression (CLR) criteria are satisfied, the OLS specification above would be able to provide an unbiased and efficient estimate of the effect of remittances on growth due to the fact that the causal effect works only in one direction.

On the other hand, if remittances are intended as investments, but still used for consumption purposes as before, it's possible that remittances may still cause growth as described previously. However, it may also be the case here that the opposite casual relationship is exists - if the recipient economy is doing well then more remittances are 'invested' to access the higher returns. Simply put, a reverse causality relationship is probable between remittances and growth. In the presence of this simultaneous relationship, our basic OLS equation would provide biased estimates of the effect of remittances on growth. Methods such as IV estimation or System Generalized Methods of Moments (SGMM) that are able to separate the causal links become necessary to obtain unbiased and efficient estimates of the causal effect of interest.

Additionally, it must be noted that the answer to this complexity cannot simply be resolved by assuming that a simultaneous relationship exists and applying the corresponding appropriate empirical method – if the true dominant relationship does not reflect this reverse causality, the IV or SGMM estimator, while unbiased, would not be the most efficient estimator. As such, we would have to question the precision of the estimates found. Under this scenario, the OLS estimator would have been both unbiased and efficient and therefore would have provided a more conclusive answer. The takeaway here then is that both methods are necessary given the ambiguities that exist.

2.3 Omitted variable bias (OVB)

The possibility of a third unknown omitted variable being correlated with the two variables at the center of this study is yet another challenge that needs to be considered in order to correctly determine the effect of remittances on growth. Two techniques are often employed in an attempt to deal with such potential issues. The first is to include in the control set of the OLS specification above, the variables deemed important to both remittances and growth within the literature. If this is done and all the variables included actually do exhaust the true list of correlated variables in reality, then the estimates of this OLS equation will be unbiased and efficient. However, given that it may not be possible to know with absolute certainty if this is the case, the second technique of inclusion of country fixed effects in this OLS specification is simultaneously undertaken. Country fixed effects account for any remaining time-invariant, unknown variables unwittingly omitted from the control set. To the extent that both time-invariant variables and the control set now exhaust the true list of all variables possibly correlated with both remittances and growth in reality, estimates will here again be unbiased and efficient. This analysis also holds when methods of addressing simultaneity are also used – fixed effects are also included in IV specifications while SGMM techniques implicitly account for them.

However, if a variable that is not time-invariant is omitted from the control set in the OLS specification above, country fixed effects would be unable to remedy this difficulty and the

resulting estimates of the OLS specification will be biased. Consequently, careful attention must be paid to include as controls variables that do vary over time and potentially bear any theoretical correlation to both remittances and growth, even if the growth literature has previously overlooked them.

### 3. Related literature: critique

This paper falls under the segment of the remittances literature that empirically investigates whether remittances are causing growth in developing countries as a group[1] through the use of panel data. As mentioned earlier, work in this area is inconclusive primarily because none of these studies simultaneously address the following two major issues: (1) the use of the correct variable representing remittances, and, (2) adequate treatment of possible endogeneity between remittances and growth. The discussion below examines the literature along these lines.

Chami, et al (2008) utilize a static empirical approach encompassing OLS, fixed-effects and instrumental variable techniques on a sample of 108 countries over the period 1970-2004 to investigate the effect of remittances on growth. Growth in real per capita GDP was regressed on the ratio of workers' remittances to GDP (expressed in logs) and a standard set of controls indigenous to the empirical growth literature. To address the issue of endogeneity the instrument 'workers' remittances to the rest of the world' was conceived[2]. This study found a significant positive effect in only one OLS regression but could not find any significant effects in any of the fixed-effects regressions. In the case of the IV regressions, significant negative effects were obtained. The overall conclusion here was that remittances seemed to be having a negative effect on growth.

Chami et al (2009) followed-up the 2008 paper by re-examining the IV regressions through the addition of another control variable – the average growth rate of the top twenty

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[1] As opposed to country and regional studies of developing countries.

[2] Finding an instrument for remittances that exhibits both cross-country and time variation has been a major challenge for the remittances literature employing a 2SLS framework.

trading partners. The argument for the inclusion of this new variable was that it would control the indirect growth effect of any country on its calculated instrument via trading channels thereby making the instrument even better. The results of this study reinforced their previous conclusions – significant negative effects were detected and no significant positive effects could be obtained. Consequently, this paper concluded that workers' remittances were more likely having a negative effect on growth.

The shortcomings of these two studies center on the adequate treatment of possible endogeneity. The first problem arises because of the use of the instrument 'workers' remittances to the rest of the world'. While in theory it is certainly plausible as a good instrument, data limitations prevent it from being appropriately constructed. The presence of missing data for many countries (both remittances and real gdp) means that the variation in the constructed instrument reflects both changes in the level of remittances of reporting countries (which represents the main idea behind the conceived instrument), as well as, changes in the number of countries used each time period (which should be held fixed). Consequently, the predicted remittances obtained from the first stage of the 2SLS regression would be misleading measure of exogenous remittances. The second problem arises from the way in which the IV regressions were conducted. The first stage regression specified in both these papers omitted the conditioning set used in the second stage and would therefore lead to biased coefficients estimates. Additionally, given that these two regressions were not simultaneously conducted, the standard errors obtained would also be biased. Given that the main conclusion (of the negative relationship between remittances and growth) of both these papers hinge on the IV regression analysis, there is certainly serious concern about the validity of these studies.

The problems of weak instruments and lack of appropriate instruments to control for possible endogeneity (within the IV framework) is a theme shared throughout the growth literature and has resulted in the adoption of many alternative econometric techniques that address the same problem. One of the more popular is the use of a dynamic empirical approach, system generalized method of moments (SGMM). Catrinescu, et al (2006), World Bank (2006) and Giuliano and Ruiz-Arranz (2006) all employ different specifications of the SGMM framework to investigate the remittance-growth relationship and all find significant positive

relationships. The major shortcoming common to these studies is the use of the aggregate measure of remittances. As such, their findings cannot be accepted as conclusive on this topic even though their methodologies may have adequately addressed endogeneity concerns.

Additionally, none of the current studies on this topic have considered the possibility that weather may be an influential source of cross-country heterogeneity in the observed remittance-growth relationships, and are consequently more prone to omitted variable bias in estimations performed. There exists a large body of literature examining the effect of natural disasters on output growth with several of them showing that a significant negative relationship exists (see Cavallo and Noy (2009) for a survey description). On the link between remittances and natural disasters, Combes and Embeke (2010) show that remittances dampen output volatility following natural disasters while Yang (2008) finds that remittances are highly responsive to hurricane exposure among poor countries. Dell and Olken (2009) provide evidence that higher temperatures reduce economic growth, particularly in poor countries. Collectively, these papers provide evidence that 'weather' is an important driver of both remittances and output growth. Consequently, empirical methodologies investigating the remittance-growth connection must take this into consideration in order to provide conclusive results.

This paper challenges the dominant empirical view put forward by Chami et al (2008 and 2009) that remittances are causing negative growth in developing countries. It contributes to this strand of the literature by addressing the shortcomings identified above and by using both static and dynamic panel data analyses. It therefore fills an important gap in the literature by addressing an open question, and by providing a more conclusive and broader framework from which conclusions may be drawn.

**4. Data**

The dataset consists of a sample of 107 countries with annual observations over the period 1970–2009. Countries were chosen on the basis of having workers' remittances data and being classified by the World Bank as 'developing.'

The two variables, the ICRG political index and the average growth rate of the top twenty trading partners, were both obtained from the authors of Chami, et al (2008). Monthly rainfall and temperature data were obtained from the National Climatic Data Center[3]. All other variables in this study were obtained from the 2011 World Development Indicators database.

All final variables used in regressions were smoothed using overlapping five-year averages with windows centered on the original observation with the aim of reducing autocorrelation bias arising from cyclical fluctuations. Further details about the specific countries included are provided in the appendix.

## 5. Empirical Methodology

The primary question being investigated is whether remittances are causing growth in developing countries. To that end, both static and dynamic panel data analyses are undertaken. This has the advantage of offering a broad view of the subject and also, by incorporating the different empirical methodologies used in this literature, ensures results are not subjective to differences in these empirical approaches (as is the case in previous studies). For additional ease of comparability, this paper also utilizes a similar construction of final variables, where applicable, and a set of controls common to the previous studies.

### 5.1 Methodology I – OLS with fixed effects

The purpose of this paper is to determine the exogenous effect of remittances on growth in developing countries. However, the remittance-growth relationship may be characterized by several different causal channels, as discussed in Section II, which bias the estimation of the specific causal relationship of interest. The empirical approach in this section aims at minimizing the size of this bias. To that end, I employ an Ordinary Least Squares (OLS) framework to

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[3] Monthly data was averaged across multiple reporting stations within each country, then imputed by country to fill in missing monthly observations and finally averaged across all months to give average monthly measures of temperature and rainfall.

estimate the causal effect of remittances on growth and I control for the influence of channels that may theoretically contaminate this estimate by including them in my regressions. Given that there is a tradeoff between reducing bias and reducing inefficiency of my estimator as more controls are included, I restrict my attention to standard controls that are regarded as important in the growth literature. In effect, the approach in this section addresses probable endogeneity issues arising from omitted variables and reverse causality.

Building on the empirical specification of Chami et al (2008), I estimate the following OLS equation:

$$Growth_{it} = \beta_0 + \beta_1 Rem_{it} + \beta_2 X_{it} + \eta_i + \mu_t + \varepsilon_{it} \tag{1}$$

where $Growth_{it}$ is the real per capita GDP growth of country i at time t; $Rem_{it}$ represents workers' remittances of country i at time t; $X_{it}$ is a conditioning set of variables for country i at time t; $\eta_i$ is a set of country-specific effects; $\mu_t$ is a set of time-specific effects; and, $\varepsilon_{it}$ is the error term for country i at time t. My primary interest is the coefficient $\beta_1$ which represents the effect of remittances on growth, assuming that endogeneity issues have been adequately mitigated. Under this framework, I test the hypothesis that $\beta_1$ is statistically different from zero.

The controls included in $X_{it}$ are intended to account for the major observable sources of endogeneity that may confound my estimate of the relationship of interest. They were selected because of their association with the dominant theories in the growth literature concerning the determinants of growth. Transitional convergence theory asserts that the initial starting position of an economy and the population growth rate both affect the transitional dynamics of that economy and consequently impact output growth rates. As such, I control for cross-country differences in these factors by including the initial level of income and population growth rate in regressions. Sound structural policies and institutions have been credited with enabling higher levels of output growth within economies. Consequently, I include measures of financial depth, trade openness and the quality of governance to account for differences in these factors among countries. Countries with better stabilization policies have been associated with larger income growth rates. Accordingly, I use inflation to control for cross-country variation. External

conditions have also been recognized as influential on income growth rates. Hence, I include measures of foreign direct investment (FDI), official aid and official development assistance (OAODA) and output growth of trading partners to control for differences in the external environment of each country.

The fixed effects included in the my specification further reduce the size of any possible remaining bias in $\beta_1$ resulting from the omission of relevant observable and non-observable variables from $X_{it}$. More specifically, $\eta_i$ controls for variation across countries due to omitted variables that are time invariant. Likewise, $\mu_t$ accounts for difference across time periods that are not influenced by which group of countries re examined.

A major innovation of this paper, and source of departure from previous studies, is the inclusion of the weather variables 'average monthly rainfall' (in 100mm) and 'average monthly temperature' (in degrees Celsius) in all specifications. The intuition behind these added controls is that weather may be a third exogenous factor driving both remittances and growth and is therefore an important source of cross-country heterogeneity that may confound observations of the exogenous remittance-growth relationship. Countries that experience bad weather outcomes may receive more countercyclical remittances and result in smaller growth rates than countries that have good weather, thereby rendering the conclusion that remittances may be negatively associated with growth. Hence, by controlling for the effects of weather in all regressions, estimated coefficients become less biased and consequently offer a more accurate picture of the remittance-growth relationship.

5.2 Methodology II – System Generalized Method of Moments (SGMM)

There is the possibility of an endogenous relationship between remittances and growth, in which case the fixed effects strategy above would lead to biased estimates. Within this framework, addressing endogeneity concerns through exogenous instruments for remittances is problematic due to the unavailability of such instruments. The SGMM methodology of Arellano and Bover (1995) and Blundell and Bond (1998) overcomes this lack of appropriate exogenous

instruments by using internal ones – lags of potentially endogenous variables are used to instrument for corresponding current values. The following similar specification to equation (1) is utilized under this methodology (where $gdp_{i,t-1}$ is the log of real per capita GDP of country i at time t-1):

$$Growth_{it} = \beta_0 + \beta_1 wrem_{it} + \beta_2 gdp_{i,t-1} + \beta_3 X_{it} + \mu_t + \varepsilon_{it} \qquad (2)$$

SGMM entails two sets of moment conditions that address possible endogeneity: first differences of the variables in the dataset are instrumented with the level series of the corresponding potentially endogenous variables lagged between two and five periods; and, level series of the variables in the dataset are instrumented with the first difference of the corresponding potentially endogenous variables lagged between one and two periods[4]. Additionally, unobservable country-specific effects are removed due to estimation of the first set of moment conditions.

To ensure the validity of results, estimations must conform to the diagnostic test criteria outlined in Roodman (2006). The specific number of lags chosen was the one that gave the best diagnostic test statistics and therefore represented the best fit. Like before, results without weather variables being included are also shown such that the importance of weather may be ascertained. Results are reported in Table 1.

## 6. Results and discussion

Table 1 reflects the results of the primary investigation of this paper – whether remittances are causing growth in developing countries. In the case of the OLS with fixed effects analysis, a positive and highly significant coefficient (5% level) on remittances is obtained. The SGMM analysis, which corrects for possible additional sources of endogeneity between remittances and growth, yields a larger positive and significant (though at the 10% level)

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[4] The number of lags used was confined as mentioned to control the number of instruments used (see Roodman (2009)), and also reflect the number of lags used in previous studies

coefficient on remittances. Both empirical frameworks therefore provide corroborating evidence that remittances are having a positive effect on growth.

These results also highlight the importance of the weather variables, rainfall and temperature, to the empirical strategies employed. Table 1 shows that the consensus (between the two empirical approaches) on the central result of a positive and significant coefficient on remittances would not have been obtained had weather not been included as a control. In the case of the OLS with fixed effects specification, weather was required to obtain a significant coefficient on remittances. Inclusion of weather also enabled a better fit of the model, as reflected in the higher within-$R^2$ statistic. For the SGMM specification, inclusion of weather variables yielded both a significant coefficient and acceptable diagnostic test statistics (thereby indicating the validity of these results and an appropriate fit of the model specified). Although the alternative SGMM specification where weather was omitted produced a significant and positive remittance coefficient, the model did not fit as well. Consequently, weather allows us to obtain more convincing results.

An interesting observation from the results shown is that the estimates obtained under both methodologies were close in magnitude. This is important because it suggests that our estimates are more robust and consequently closer to the truth than those of the dominant studies. In those papers, the different methodologies used gave very different results.


**7. Conclusion**

This paper asserts that the current empirical literature on the effect of remittances on growth in developing countries is inconclusive and aims to fill this gap. It contributes to the existing literature by first identifying the major shortcomings rendering these studies inconclusive and then adopting an empirical framework that explicitly addresses these issues. Through the utilization of both static (OLS with fixed effects) and dynamic (SGMM) panel data analytical techniques, a broader and more conclusive framework from which conclusions can be drawn is provided.

The central aim of this paper was an empirical re-examination of the relationship between remittances and growth in developing countries. The results obtained provide robust evidence that remittances are indeed causing positive growth in these countries. This is a stark contrast to the existing view of the two dominant studies on this topic. These studies emphasize that no significant positive relationships between remittances and growth could be obtained in their empirical strategies and that the only significant relationships obtained were negative ones, leading to their overall conclusion of a negative remittance-growth relationship. In challenging this previously held belief, the policy prescriptions implied by this paper is that developing countries should actively encourage remittance inflows.

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Table 1 – Estimation results for static and dynamic equations ((1) and (2))

| | Static analysis: Fixed Effects | | Dynamic analysis: SGMM | |
|---|---|---|---|---|
| | Without Weather | With Weather | Without Weather | With Weather |
| Rem | 0.362 | 0.559** | 0.447* | 0.617* |
| | 0.192 | 0.038 | 0.099 | 0.054 |
| Initial GDP | 3.755 | 2.844 | -0.503 | 0.384 |
| | 0.144 | 0.242 | 0.314 | 0.406 |
| Trade | 0.662 | 1.308 | 0.492 | 3.391 |
| | 0.418 | 0.234 | 0.729 | 0.276 |
| M2 | -1.775 | -2.451* | -1.874 | -3.813 |
| | 0.168 | 0.060 | 0.468 | 0.239 |
| Inflation | -0.225 | -0.231 | 0.801 | -0.346 |
| | 0.367 | 0.364 | 0.193 | 0.632 |
| AGTP | 0.514 | 0.505 | 1.245 | 0.878 |
| | 0.185 | 0.289 | 0.120 | 0.432 |
| FDI | 0.449** | 0.514* | -0.256 | 0.920* |
| | 0.049 | 0.059 | 0.626 | 0.069 |
| OAODA | -0.082 | 0.022 | 0.949 | 0.367 |
| | 0.626 | 0.926 | 0.140 | 0.337 |
| Pop growth | -0.816 | -0.784 | -5.060*** | -0.885 |
| | 0.216 | 0.203 | 0.007 | 0.512 |
| ICRG | 4.125** | 5.287** | 14.878** | 6.230 |
| | 0.014 | 0.013 | 0.011 | 0.140 |
| NDC | -0.488 | 0.061 | 0.246 | 1.817 |
| | 0.509 | 0.923 | 0.900 | 0.434 |
| Rain | | -0.084 | | -0.062 |
| | | 0.498 | | 0.399 |
| Temp | | -0.002 | | -0.212 |
| | | 0.995 | | 0.318 |
| Constant | -45.915* | -43.610* | -54.191* | -31.642* |
| | 0.061 | 0.079 | 0.071 | 0.066 |
| Obs | 751 | 611 | 790 | 630 |
| No. countries | 49 | 45 | 57 | 51 |
| Within R-squared | 0.436 | 0.480 | | |
| No. instruments | | | 56 | 47 |
| Hansen p-val | | | 0.551 | 0.724 |
| AR1 | | | 0.007 | 0.043 |
| AR2 | | | 0.251 | 0.162 |

- Dependant variable is real per capita GDP
- * Significant at 10%; ** significant at 5%; *** significant at 1%
- P-values are provided below coefficients
- Robust, clustered standard errors were specified for OLS-FE regressions
- All specifications contain time-specific effects (not shown)

Figure 1: Total reported net inflows to Developing Countries over 1989-2009
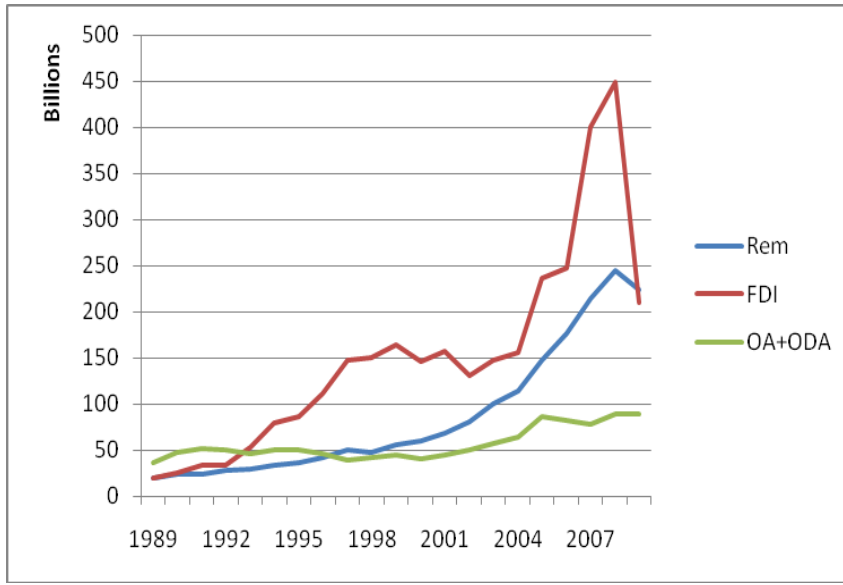


Figure 2: Annual growth (percent) of total reported net inflows to Developing Countries over 1989-2009
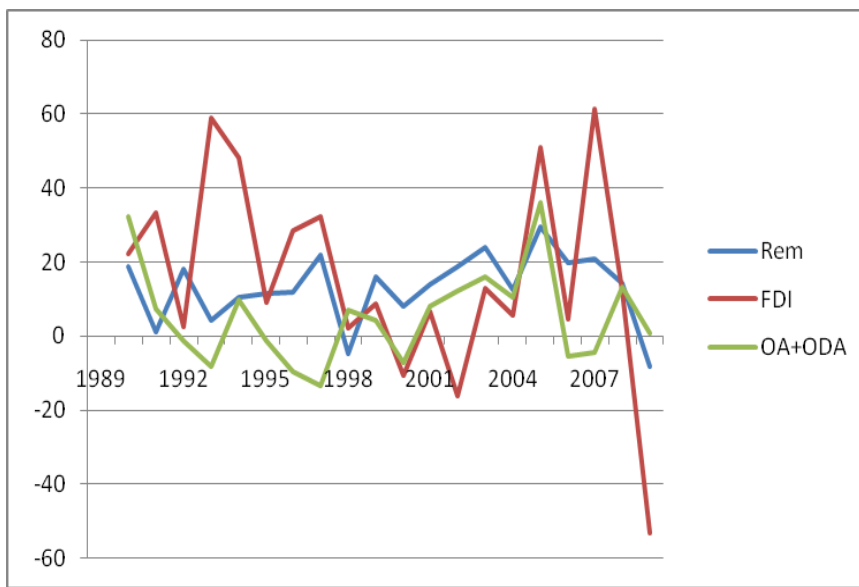
Figure 3: Standard deviation of total reported net inflows to Developing Countries over 1989-2009
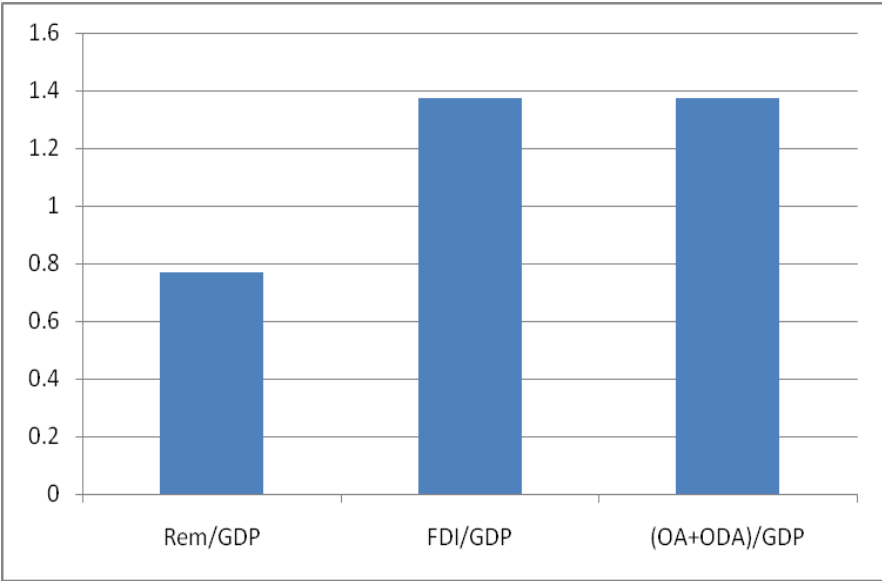
Table 2 – 107 developing countries included in sample

| | | |
|---|---|---|
| Albania | Gambia, The | Peru |
| Algeria | Georgia | Philippines |
| Argentina | Ghana | Poland |
| Armenia | Guatemala | Romania |
| Azerbaijan | Guyana | Russian Federation |
| Bangladesh | Honduras | Rwanda |
| Barbados | Hungary | Senegal |
| Belarus | India | Serbia |
| Belize | Jamaica | Seychelles |
| Benin | Jordan | Sierra Leone |
| Bolivia | Kazakhstan | Slovak Republic |
| Bosnia and Herzegovina | Kenya | Solomon Islands |
| Botswana | Kiribati | Somalia |
| Brazil | Korea, Rep. | Sri Lanka |
| Bulgaria | Kyrgyz Republic | St. Kitts and Nevis |
| Burkina Faso | Latvia | St. Lucia |
| Burundi | Lebanon | Sudan |
| Cameroon | Lesotho | Suriname |
| Chad | Lithuania | Swaziland |
| China | Macedonia, FYR | Syrian Arab Republic |
| Colombia | Madagascar | Tajikistan |
| Comoros | Malawi | Tanzania |
| Costa Rica | Maldives | Thailand |
| Cote d'Ivoire | Mali | Togo |
| Croatia | Malta | Tonga |
| Cyprus | Mexico | Trinidad and Tobago |
| Czech Republic | Morocco | Tunisia |
| Dominica | Nepal | Turkey |
| Dominican Republic | Nicaragua | Uganda |
| Ecuador | Niger | Ukraine |
| Egypt, Arab Rep. | Nigeria | Uruguay |
| El Salvador | Oman | Vanuatu |
| Estonia | Pakistan | Venezuela, RB |
| Ethiopia | Panama | Zambia |
| Fiji | Papua New Guinea | Zimbabwe |
| Gabon | Paraguay | |