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Remittance Stability, Cyclicality and Stabilizing Impact in Developing Countries

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Abstract

That remittances are a stable source of external finance seems to have become the received wisdom. In addition, many studies have found remittances to behave counter-cyclically, increasing during crises and times of hardship for the recipient countries. Are remittances reliable macroeconomic stabilizers? To answer this question, the present study examines the stability, cyclicality, and stabilizing impact of remittances in comparison with the same three features for other foreign-exchange inflows, namely foreign direct investment and official development aid. The analysis is performed at the country and regional levels rather than at the aggregate or global level (on which much of the received wisdom rests), because policymakers are concerned with the impact of remittances in their country rather than at the global level. The main findings for 1980-2007 are that in a majority of countries: i) official development aid is more stable than remittances, and remittances are more stable than foreign direct investment; ii) official development aid is counter-cyclical, while remittances are pro-cyclical, although less so than foreign direct investment; and iii) official development aid is stabilizing and remittances are destabilizing, although less so than foreign direct investment. The paper suggests that it is necessary to examine counter-cyclicality separately from the stabilizing impact, as the former does not seem to always imply the latter.

This paper—a product of the Trade and Integration Team, Development Research Group—is part of a larger effort in the department to research determinants and implications of migration. Policy Research Working Papers are also posted on the Web at http://econ.worldbank.org. The authors may be contacted at _mschiff@worldbank.org and ineagu@worldbank.org.

Remittance Stability, Cyclicality and Stabilizing Impact in Developing Countries

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1. Introduction

Global remittance flows to developing countries have experienced accelerated growth since the early 1990s, increasing from less than $50 billion around 1990 to a whopping $328 billion in 2008 (Ratha et al, 2009). Statistics by country indicate India, China, and Mexico as the largest recipients of money from migrants abroad. In contrast, Tajikistan, Tonga and Moldova, and other small states lead in terms of the share of remittances in GDP. Among factors considered to have triggered this rapid growth are the increase in international migration, the cost reductions as well as convenience of transferring money through formal channels, and the better measurement and reporting of remittances in the Balance of Payments statistics.

The evolution of remittances flows prompted researchers to evaluate their role as an external foreign exchange inflow and their ability to neutralize macroeconomic shocks and reduce output volatility. We add to this literature by examining the remittances' (REM's) stability, cyclicality and stabilizing impact, in comparison to the same three features of two other external inflows, namely foreign direct investment (FDI), and official development aid (ODA). Our methodology relies on coefficients of variation to assess the stability and stabilizing impact, whereas cyclicality is evaluated using correlations between GDP on the one hand and the original measures as well as the cyclical components of REM, FDI and ODA on the other.

The analysis covers 116 countries over the period 1980-2007 and reveals that ODA is more stable than REM in 73% of the countries examined and REM more stable than FDI in 72% of them. The coefficients of variation (CV) for 1980-2007 averaged over the sample countries confirm that ODA is the most stable (CV = .47), followed by REM (.75) and FDI (1.47). In terms of cyclicality, the results indicate that REM is pro-cyclical, FDI more pro-cyclical, and ODA counter-cyclical. Finally, ODA has a stabilizing impact in 56% of the countries examined, while REM and FDI are destabilizing or have no effect in most of the countries (around 80% and 90%, respectively).

Our strategy of comparing the behavior of remittances and other capital flows has been previously employed by other studies in the literature (Ratha, 2003, IMF 2005, Lueth and Ruiz-Arranz, 2007). The motivation for this approach relates to the fact that, as explained in Frankel (2009), capital flows are in theory expected to deliver the benefits of smoothing, diversification,

financing high-return investment opportunities, and disciplining policies. However, they have been shown to typically fail at fulfilling these expectations. It is, thus important to check the extent to which alternative sources of foreign exchange such as remittances and ODA are, in contrast to private flows, more reliable macroeconomic tool in the hands of policymakers. We aim to improve on previous comparisons of these capital inflows by providing a description of their behavior according to additional measures to those used in prior studies.

We contribute to the literature in several ways. First, we conduct the analysis at the country-level, for a large number of countries and a wide time-frame. This is because some of the conventional wisdom on the stability of remittances both absolute and relative to ODA and FDI is based on aggregate (global) data even though policymakers are typically concerned with the behavior of these flows at their own country level. Furthermore, most empirical work focusing on the macroeconomic impact of remittances typically constrains the estimated effects to be the same for all countries in the sample.[1] Second, we treat stability, cyclicality and stabilizing impact separately, while most previous literature has typically equated counter-cyclicality with stabilizing impact. As elaborated in Section 2.3 and shown in Section 4, the former measure implies the latter one for most countries, but not necessarily for all. Although some studies have examined the stabilizing impact distinctly from counter-cyclicality, by estimating the impact of remittances on the variability of GDP (or GDP growth),[2] they tended to do so by imposing an identical relationship between these variables for all countries. In contrast, our methodology allows us to identify the behavior of the various foreign capital inflows separately for each country.

The paper is organized as follows: Section 2 reviews prior literature, Section 3 describes the data, Section 4 presents the empirical results and Section 5 concludes.

2. Selected Literature Review

Section 2.1 describes studies that examine the behavior of stability of remittances and other external inflows. Section 2.2 reviews research that uses statistical methods to analyze cyclicality of remittances in relation to output volatility. Finally, Section 2.3 discusses how the issue of stabilization has been approached hitherto in the literature.

[1] One exception is Chami et al. (2005), who run regressions at country level.
[2] IMF (2005), Acosta et al (2008)

2.1. Stability

Ratha (2003) was the first to point out the recent remarkable ascending path of global remittances compared to the evolution of other sources of external financing, namely foreign direct investment (FDI), capital non-FDI flows and official development aid (ODA). Moreover, the study found remittances to be more stable than ODA and FDI and much more so than the pro-cyclical non-FDI capital inflows. This latter finding was confirmed by subsequent research including Buch and Kuckulenz (2004) and IMF (2005).

While previous analyses of stability typically focused on global external inflows, our paper examines the issue at the country-specific level, relying on as many individual countries as we could find data for.

2.2. Cyclicality

The claims of large size and relative stability of remittances flows elicited the interest of researchers and policy makers alike who became interested in examining remittances' potential to reduce output volatility and absorb macroeconomic shocks. To that goal, many studies attempted to determine the behavior of remittances in relation to macroeconomic indicators, more particularly whether the former move counter- or pro-cyclically with the latter.

The discussion about cyclicality found a theoretical justification in the literature studying the determinants of remittances. There are several theories explaining why migrants remit. The first gives prevalence to family ties, considered to favor the sending of remittances through various channels, of which an important one is the altruistic motive. The altruistic motive of remitting hypothesizes that migrants help relatives and friends back home out of care considerations, without envisioning a pecuniary or alternative material interest. In other words, the welfare of distant relatives and friends is a component of migrants' own utility function (Rapoport and Docquier, 2006, Niimi et al, 2008). Under this assumption, remittances are expected to behave counter-cyclically, with migrants remitting more during times of economic hardship in the origin countries. The second, more recent theory holds that migrants optimize placement of their savings between origin and destination countries. Hence, remitting money is a form of investment. This theory is broadly called "the portfolio" approach and its prediction is that remittances display a

pro-cyclical trend relative to macroeconomic indicators and private capital flows. Most empirical studies focusing on the causes of remittances have found prevalent evidence for the altruist motive as opposed to the portfolio one. See Elbadawi and Rocha (1992) for a detailed review, and Agarwal and Horowitz (2002) as a more recent contribution.

Support for the importance of the altruist motive in remitting is also widespread in the literature studying the response of remittances in the aftermath of disruptive events such as natural disasters, political conflicts or specific economic crises. Thus, Clarke and Wallsten (2004) find that remittance inflows increased following a natural disaster in Jamaica. Gupta (2004) obtains a positive impact of an Indian drought on the cyclical component of remittances received by the country. Ratha (2006) indicates that remittance inflows increased after natural disasters in Bangladesh, the Dominican Republic, Haiti and Honduras, as well as in response to conflicts in Albania and in Sierra Leone. They remained substantial during conflict in Ivory Coast (Black et al, 2004). Yang (2008) also finds an increase in remittances following natural disasters. A similar result is suggested by Joseph and Mohapatra (2009) in an ongoing work utilizing data for a large set of developing and high-income countries during 1970-2006. Hysenbegasi and Pozo (2002) find sharp increase in remittances after large macroeconomic shocks and currency crises in the Latin American and Caribbean countries. Yang and Choi (2007) employ household level data for the Philippines and find that in households with overseas migrants, exogenous changes in income lead to changes in remittances of the opposite sign. Halliday (2006) shows that adverse agricultural conditions increased remittances inflows in El Salvador.

On the other hand, Lueth & Ruiz-Arranz (2006) obtain that for the eleven countries in their analysis remittances do not seem to increase in the wake of natural disasters. In the same line, Ratha (2003) mentions that remittance receipts declined in Turkey and the Philippines after the financial crises that hit the countries in the late 1990s, although the decline was less than that of other capital inflows. This evidence prompted Ratha (2003) to assert that the response of remittances to dramatic changes in economic activity was unclear.

As for the empirical literature examining the cyclicality direction of remittances in relation to macroeconomic indicators, the conclusions are mixed. In support to the counter-cyclical response, Mishra (2005) finds for 13 Caribbean countries that a 1 percent decrease in real GDP leads to a 3 percent increase in remittances two years later. Similarly, Bouhga-Hagbe (2004) shows that remittances to Morocco are, over the long run, negatively correlated with real GDP in Morocco.

El Sakka and McNabb (1999) find that remittances to Egypt increase with country's inflation. In a panel specification including 113 countries and up to 29 years, Chami et al. (2005) obtain that remittances to GDP are negatively correlated with the GDP growth.

Examining the determinants of remittances using a panel of 101 countries during 1970-2003, IMF (2005) finds a significant negative impact of home country output on remittances. Nevertheless, the study's analysis of the correlations between aggregate remittances and other inflows on the one hand, and GDP on the other indicates that remittances are positively correlated with GDP, although they are not as sharply procyclical as the non-FDI capital inflows.

Acosta et al (2008) examine the correlation between the cyclical components of remittances and real output in recipient countries for 26 Latin American countries and find evidence of counter-cyclicality even after controlling for the endogeneity of output fluctuations. Extension of the analysis to other developing countries leads to the same result, but also reveals great heterogeneity by country group in the sensitivity of remittances to oscillations in the real output. The aggregated de-trended remittances sent to the 12 countries examined in Sayan (2006) are also negatively correlated with de-trended GDP. Nevertheless, both Acosta et al (2008) and Sayan (2006) find that the correlations at country-specific level weaken the verdict of counter-cyclicality obtained from the aggregate level analyses. Thus, several countries in the samples of each study exhibit pro- rather than counter-cyclical remittances in relation to output. This result prompts Sayan (2006) to conclude that "counter-cyclicality is hard to generalize to all countries."

Representing the literature which gives preference to the "portfolio" approach in remitting, Lueth and Ruiz-Arranz (2006) conclude that remittances are aligned with the business cycle in the recipient country. Their analysis is based on estimating a gravity model of the determinants of remittances in 11 countries. Lueth and Ruiz-Arranz (2007) employ time series data and a vector error correction model to find that remittances to Sri Lanka are pro-cyclical. In addition, the study compares remittances with other external flows and obtains a negative correlation between ODA and GDP, as well as positive correlations between remittances (private capital flows) and GDP. Finally, Giuliano and Ruiz-Arranz (2005) show that remittances are more pro-cyclical in countries with shallower financial systems.

Our study finds that at the country specific level counter-cyclicality of remittances is observed less often than pro-cyclicality, suggesting that, for the majority of the large number of countries examined, the portfolio motive of remitting is stronger than the altruist one.

2.3. Stabilization

The general perception arising from the literature that evaluates the cyclicality of remittances seems to be that counter-cyclicality automatically implies the ability to buffer macroeconomic shocks. Thus, Sayan (2006) states that the "countercyclicality enables remittances to serve as a stabilizer that helps smooth out large fluctuations," while "in the case of procyclicality, remittances may act as a destabilizing force since this would increase the capacity of swings in remittance flows to produce additional fluctuations in output or current account balances, with serious macroeconomic effects." In the same line, Lueth and Ruiz-Arranz (2006) conclude that remittances may not play a major role in limiting vulnerability to shocks, because they are found to be aligned with the business cycle in the home country.

One skeptical voice is that of Chami et al (2005) who despite finding remittances to be counter-cyclical question their role as a tool for economic development, because of what they consider the moral hazard accompanying the process of remitting money. This would be caused by the asymmetric altruism leading to free riding of remittance recipient on senders' good will. In other words, recipients tend to work less when relying on money from abroad.[3]

IMF (2005) and Acosta et al (2008) go one step further and examine empirically the direct impact of remittances on output growth volatility. The former study finds that "a 2.5 percentage point increase in the remittances/GDP ratio is on average associated with a one-sixth decline in aggregate output volatility." In turn, Acosta et al (2008) obtain that "countries with larger remittances flows (as a percentage of GDP) tend to have less volatile real output fluctuations," with one standard deviation increase in remittances reducing the standard deviation of growth in real output per capita by more than 10 percent.

[3] However, the fact that they work less in response to remittances need not indicate the presence of moral hazard. It may simply be an optimal response of recipients since the demand for leisure tends to rise with income. A problem would arise if recipients behaved strategically and worked less in order to obtain more remittances from those who migrated.

An interesting finding, by Bugamelli and Paternò (2005), is that remittances tend to help countries obtain access to foreign capital flows and therefore prevent them from having to implement drastic Current Account reversals. Such an impact might be more likely to be captured by econometric estimation than by our analysis.

Our study finds that remittances are not stabilizing for the majority of analyzed countries. Though the results should be of much interest to policymakers and analysts, it is clear that further work is needed and additional empirical analysis is on our research agenda. Our study also points out the necessity to consider the issues of cyclicality and stabilization separately. While the two features seem to indeed go together in most cases, the several instances when this is not true suggest that counter-cyclicality does not necessarily trigger stabilization.

We say that a capital inflow X (X = *ODA, FDI* or remittances R) is stabilizing (destabilizing) if the coefficient of variation of (GDP + X) is smaller (larger) than that of GDP, i.e., if $CV(GDP+X) \lessgtr CV(GDP)$. Since $Var(GDP+X) = Var(GDP) + Var(X) + 2cov(GDP,X)$, it follows that $Var(GDP+X) \gtrless Var(GDP) \leftrightarrow Var(X) + 2cov(GDP,X) \gtrless 0$.

Thus, the fact that X is counter-cyclical, i.e., that $cov(GDP,X) < 0$, does not ensure that $Var(GDP+X) < Var(GDP)$ or that $CV(GDP+X) < CV(GDP)$. Whether X is actually stabilizing or not will depend on the level of both $Var(X)$ and the average value of (X/GDP), denoted here by χ. If $Var(X)$ is large and χ is small, X might be counter-cyclical and destabilizing at the same time.

A possible though less likely scenario is for X to be pro-cyclical as well as stabilizing. In this case, $cov(GDP,X) > 0$, and since $Var(X) > 0$, it follows that $Var(GDP+X) > Var(GDP)$. Nevertheless, it is possible for X to be stabilizing, i.e., for $CV(GDP+X) = \frac{SD(GDP+X)}{\overline{GDP+X}}$ to be smaller than $CV(X) = \frac{SD(X)}{\overline{X}}$ (where "*SD*" stands for "standard deviation", and the upper bars above the denominators denote the mean values). A necessary condition for that to occur is for χ to be sufficiently large so that the ratio [$GDP+X)/GDP$] is larger than $SD(GDP+X)/SD(GDP)$. This

would only likely to be the case for countries that are small and poor and thus have low GDPs and are very open to migration and recipients of large amounts of remittances.

In summary, the cyclicality of remittances may indicate whether altruism or self-interest is the dominant motive in a particular country. It will also indicate whether remittances are stabilizing or not in most cases, though certainly not in all of them. Counter-cyclical remittances (or other sources of capital inflows) may be destabilizing, and vice versa, though the latter would seem to be less likely prevalent. As shown in Section 4.3, these types of results actually do occur for some countries.

3. Data

We employ the following indicators: Remittances, Foreign Direct Investment or FDI (net inflows), Official Development Aid (ODA), and GDP. Remittances are defined as the sum of three series from the IMF Balance of Payments: workers' remittances, migrants' transfers and compensation of employees. All the other data come from the World Bank's World Development Indicators (WDI). The FDI, originally reported by the IMF Balance of Payments Statistics as "Direct Investment in reporting country", is comprised of equity capital, reinvested earnings and other claims/liabilities on/to direct investors. Variables are expressed in US million dollars. Remittances, ODA and FDI are converted from current US dollars into constant 2000 US dollars by using the US GDP deflator.

Our sample includes 116 developing countries of which 36 are low income, 45 lower middle income and 35 upper middle income. By geographical criterion, 15 countries are from East Asia and Pacific (EAP), 20 from Europe and Central Asia (ECA), 28 from Latin America and the Caribbean (LAC), 10 from Middle East and North Africa (MENA), 6 from South Asia (SA), and 37 from Sub-Saharan Africa (SSA). Appendix Table A1 lists the names of the countries and the classifications by income group and by regions.

Remittance data for some individual countries are incomplete. Sixty-four of the 116 countries taken into consideration have values for 20 or more years (with an average of 910 million

constant US dollars), 39 report data for 10 to 19 years, while 13 for less than 9 data points. Remittances are available in all years for 34 countries[4].

Table 1 presents general statistics related to the shares of REM, FDI and ODA in GDP. Panel a includes means, medians, standard deviations, and the maximum values for all countries and years pooled together, while panel b lists the same for country averages (across years). Both panels reveal that ODA is more important than REM as a share of GDP. On the other hand REM represents a larger share of GDP compared to FDI. The series have a large dispersion as shown by the magnitude of standard deviations relative to that of the means. Furthermore, while the minimum values of all three series are close to zero and the means do not exceed 9.7%, the maximum values are much higher, ranging from 86.24% for FDI to 94.18% for REM in panel a, and from 14.57% for FDI to 79.43% for ODA in panel b. The differences between means and medians reveal that the distributions of the three shares are skewed to the left, with REM exhibiting the highest degree of skewedness.

4. Empirical Results: REM, FDI and ODA

4.1. Stability

In order to evaluate the stability of remittances, ODA and FDI, coefficients of variation covering the period 1980-2007 are calculated for each indicator by country.[5] Additionally, these coefficients of variation are averaged with and without weights across all countries in the sample as well as for separate geographic regions and income level groups.

The averages of the coefficients of variation for various aggregates are presented in Table 2. Panels a and b indicate that across the 116 developing countries and regardless of whether the averages are simple or GDP-weighted, ODA is the most stable of all the inflows (with CV of 0.47 in panel a, and 0.55 in panel b), followed by REM (0.75 in panel a, and 0.94 in panel b), and FDI (1.47 in panel a, and 1.12 in panel b). This pattern is robust to aggregations by region as well as income groups, with the exception of the Middle East and North Africa (MENA) for which REM is more stable than the ODA (CV of REM is 0.31 in both panels, while CV of ODA is 0.54 in

[4] Bangladesh, Bolivia, Botswana, Brazil, Cameroon, Cape Verde, Colombia, Costa Rica, Dominica, Dominican Republic, Egypt, Arab Rep., El Salvador, Ethiopia, Ghana, Guatemala, Honduras, Jamaica, Jordan, Lesotho, Mexico, Morocco, Mozambique, Pakistan, Panama, Paraguay, Philippines, South Africa, Sri Lanka, St. Kitts and Nevis, Sudan, Swaziland, Thailand, Tunisia, Turkey.

[5] Tables with coefficients of variation by country are available from the authors upon request.

both panels). The reverse in importance for MENA is not due to the ODA, the stability of which lies in the range reported for other geographical areas, but to REM instead, with its CV well below the average for any of the groups considered. Looking closer into this issue we find eight of the ten MENA countries in the analysis to experience more stable REM than ODA during the period analyzed (Egypt, Jordan, Lebanon, Libya, Morocco, Syria, Djibouti and Yemen). The exceptions are Tunisia and Algeria.

Panel b indicates East Asia and Pacific and the lower middle income countries as having the most volatile remittances (CV=1.36 and 1.12, respectively). This outcome is related to a member of both groups, namely China, which has a high REM volatility (CV=1.57), but also the highest income relative to the other EAP and lower middle income countries.

Finally, as revealed by both panels, FDI's stability increases with income. On the other hand, the stability of ODA decreases with countries' income in panel a. This pattern would be observed in panel b as well if it were not for Nigeria, the relative economic importance and high CV of which push up the weighted average of the low income group from 0.38 in panel a to 0.66 in panel b. Nigeria's CV for ODA amounts to 2.37.

Table 3 summarizes the country-level situation by presenting the percentage of countries for which a particular inflow (series A) is more stable– i.e. has a lower coefficient of variation - than another inflow (series B). REM is more stable than ODA in only 27% of the 116 developing countries, but is more stable than FDI in 72% of the countries. ODA is overwhelmingly more stable than FDI (in 91% of cases) and REM (in 73% of cases). Thus, the order suggested by Table 2 holds here as well: the ranking of stability from the most to the least stable is ODA-REM-FDI. The pattern is confirmed for all income-level groups as well as for all geographical regions except MENA. The most MENA countries considered in this study experienced more stable REM than ODA during the analyzed period.

4.2. Cyclicality

If remittances are predominantly driven by altruistic motives, it can be expected that migrants send more money during periods of economic slowdown characterized by declining GDP. To investigate the counter-cyclicality of remittances vis-à-vis GDP, correlations between GDP on the one hand, and REM, ODA and FDI on the other, are calculated for each country, and - as in the previous section - at aggregate level and for geographical and income-level groups. We present

results using both the original indicators (in conformity with the methodology employed in the sections about stability and stabilizing impact) and de-trended ones (which is the norm in the literature examining cyclicality). As an additional exercise, the tables also include correlations between GDP and the sum of all 3 indicators, REM+ODA+FDI. Correlations between GDP and the sum of two of the three indicators (REM+ODA, REM+FDI, ODA+FDI) are provided in Appendix Tables A2 through A5.

Table 4 is based on original (non de-trended) indicators and reports the coefficients of correlation for various country aggregations. ODA is negatively correlated with GDP for most groups in panel a, based on simple averages, but also for most groups of panel b where the economic size of countries is taken into account. The correlation between GDP and ODA across all developing countries is negative but quite small in both panels (a: -0.02; b: -0.20). South Asian countries have larger negative coefficients relative to the other groups: -0.28 in panel a, and -0.67 in panel b). The coefficient for Europe and Central Asia, although positive (0.14) in panel a, becomes -0.23 in panel b, indicating a stronger negative correlation between GDP and ODA for countries with higher GDP. In the case of Sub-Saharan Africa, the presence of many countries with positive correlation between ODA and GDP is mirrored by the positive correlation coefficient of 0.13 in panel a. The even higher value in panel b, namely 0.56, is due to high coefficients coupled with relative economic importance of countries such as South Africa (0.72) and Nigeria (0.58). Nigeria also contributes to the positive coefficient of the low income group in panel b (0.10).

Remittances are mostly positively correlated with GDP, and the coefficients vary widely in size not only by group but also by method of calculation. The unweighted figure for all the 116 developing countries is 0.50, but accounting for the economic size changes the average to 0.66, reflecting the higher correlation coefficients in the larger economies and suggesting that the portfolio or investment motive is stronger in larger than in smaller countries. Most groups have positive correlation coefficients that exceed 0.50 in both panels. For Europe and Central Asia the 0.67 coefficient in panel a declines to 0.12 after weighting because of countries with low or negative correlations and high GDP such as Russia, Belarus and Turkey. Similarly, the unweighted positive correlation coefficient for MENA (0.32 in panel a) becomes 0.12 in panel b due to Algeria (-0.85), Yemen (-0.42) or Egypt (-0.27). Presence of Algeria in the group also reduces correlation coefficients in panel b as opposed to panel a, for FDI, ODA and to the highest degree for REM+FDI+ODA. As indicated in Table A2, panel b, a similar pattern is observed for the correlations with GDP of REM+FDI, REM+ODA and FDI+ODA. Correlation between REM

and GDP is significantly higher in the weighted scenario than the unweighted one for Sub-Saharan Africa (because of Nigeria, with correlation coefficient of 0.71, and South Africa, with correlation coefficient of 0.97).

In general, Table 4 reveals that with few exceptions REM has smaller positive correlations with GDP compared to FDI. In conclusion, while ODA behaves consistently counter-cyclically, REM and FDI are pro-cyclical, with FDI more so than REM. The analysis to this point reveals that of the three inflows, ODA is the most susceptible to help buffer economic crises. While it is not surprising that FDI is positively related to GDP, the finding of pro-cyclicality for REM would seem to imply that the portfolio or investment motive for remitting dominates the altruistic motive.

The share of countries with the non-de-trended indicators of interest negatively correlated with GDP is provided in Table 5.[6] On the one hand, 54% of countries have countercyclical ODA (between 33 and 80% in the various groups). On the other, more than 50% of them display a pro-cyclical pattern for REM and FDI. Overall, FDI flows are pro-cyclical for a larger number of countries compared to REM and ODA. Thus, 11% of countries have negative correlations between FDI and GDP, compared to 21% for REM, and 54% for ODA. At group level, this order in magnitude is reversed only for FDI and REM in the case of East Asia and the Pacific.

Both Tables 4 and 5 indicate that REM and FDI are more pro (ODA is more counter) -cyclical in the lower and upper middle income groups than in the low income group.[7] Thus, the correlation coefficient between FDI and GDP is about 0.60 for both lower and upper middle group countries in panel a of Table 4, while the figure for low income countries is 0.40. The same ranking, although with different magnitudes, is apparent in panel b. Likewise, as shown in Table 5, 94% of the upper middle income countries have pro-cyclical FDI as opposed to 81% of the low income ones. The correlation coefficient between REM and GDP is 0.33 in panel a, and 0.43 in panel b for low income countries, but reaches 0.58 (0.77) for lower middle income countries in panels a (b). On the other hand, 67% (60%) of the lower (upper) middle income countries have counter-cyclical ODA, as opposed to 33% of the low income ones.

[6] Indices of correlation by country are available from the authors upon request.
[7] With respect to remittances, this finding is in contrast to Acosta et al (2008) who obtain that "at least among developing countries, the countercyclicality of remittances appears to increase with income, being highest among upper-middle-income countries."

Finally, comparison of the last columns in Table 4 to Appendix Table A2, as well as of the last column in table 5 to Appendix Table A3, reveals that adding ODA to REM+FDI reduces the pro-cyclicality of these inflows, while adding REM to FDI+ODA and adding FDI to REM+ODA increases pro-cyclicality in most cases.

Since the majority of studies focusing on the correlation between GDP and remittances examine only the relationship between the cyclical components of the indicators, we present equivalents of Tables 4 and 5 using variables de-trended based on Hodrick-Prescott's method. Table 6 (A4) is the counterpart of Table 4 (A2) in that it presents the coefficients of correlation aggregated by regions and groups, while Table 7 (A5) mirrors Table 5 (A3) by indicating the percentage of countries for which de-trended flow A is counter-cyclical.

The results in Tables 6 and 7 weaken, but do not invalidate the conclusions reached using the analysis of the non-detrended indicators. Thus, the coefficients of correlation presented in Table 6 are closer to zero than the ones in Table 4, suggesting a lack of strong link for all inflows and within most groups considered. While REM and FDI are pro-cyclical in the majority of cases (the percentages of countries with counter-cyclical REM or FDI are less than 50% in Table 7), ODA's counter-cyclicality is much less obvious in both Table 6, where most coefficients reported by panel b are positive, and in Table 7, where the percentage of countries with counter-cyclical ODA, although still higher than that of REM and FDI, is most often below 50%. FDI is pro-cyclical in still a greater number of countries than REM for most groups considered (exceptions as per Table 7: East Asia and Pacific, Europe and Central Asia and the lower middle income countries). As a general result, ODA is counter-cyclical in 43% of all developing countries, REM in 35% of them meaning it is pro-cyclical in 65%) - while FDI is counter(pro)-cyclical in 31%(69%).

Although in a weakened version, the conclusions according to which REM and FDI are more pro (ODA is more counter)-cyclical in the lower and upper middle income groups than in the low income group hold in the analysis based on de-trended indicators as well. Likewise, adding ODA to REM+FDI (REM to FDI+ODA and FDI to REM+ODA) is found to reduce (increase) pro-cyclicality of the flows (as shown in Tables A4/A5).

4.3. Stabilizing Impact

We examine now whether or not the various capital flows are stabilizing. This differs from cyclicality which looks at the relationship between annual changes in GDP and annual changes in these flows, while stabilization looks at the impact of these flows on stability over the entire period. Table 8 presents the shares of countries for which REM, FDI, ODA and REM+FDI+ODA help decrease the variability of GDP measured by the coefficient of variation. Appendix Table A6 provides the stabilizing impact of REM+FDI, REM+ODA and FDI+ODA.

The results depict ODA as the most stabilizing of the three inflows (stabilizing GDP in 56% of the countries), followed by REM (20%) and FDI (11%). The situation is similar for the various groups examined. With respect to the "marginal" stabilizing impact, we observe that adding ODA to REM+FDI increases the stabilizing impact of these inflows, i.e. ODA+REM+FDI is more stabilizing than REM+FDI, while adding REM to FDI+ODA and adding FDI to REM+ODA decreases it. In fact, ODA+REM+FDI is stabilizing in close to twice as many countries as REM+FDI (30% vs. 19%). Interestingly, the stabilizing impact of both REM and ODA decreases with income (ranging from 25% and 61% for the low income countries to 11% and 43% for the upper middle income ones).

Together with the findings in Tables 5 and 7, it appears that ODA is both counter-cyclical and stabilizing, REM is mostly pro-cyclical and destabilizing, while FDI is more pro-cyclical and more destabilizing than REM.

Note that it is possible for the CV(X+GDP) to be larger (smaller) than CV(GDP) even if the correlation coefficient between X and GDP is < (>) 0 (X=REM, ODA or FDI).[8] This is illustrated by the group of lower middle income countries, where pro-cyclicality of REM is more widespread than that of FDI (73% of countries for REM as opposed to 69% for FDI as shown by Table 7), although REM is more stabilizing than FDI (22% of the countries for REM as opposed to 7% for FDI in Table 8). As another example, ODA is counter-cyclical in one third of the low-income group countries, but stabilizing in 61% of these countries (i.e. in 85% more countries). This dramatic difference suggests the presence of a substantial number of countries where greater counter-cyclicality for ODA is not related to a stabilizing impact of ODA. Furthermore, of the 92 countries that have pro-cyclical REM (with cyclicality being assessed based on original

[8] For additional theoretical background, see discussion in section 2.3.

indicators), a stabilizing effect is still present in 9 of them (or 10%). Additionally, the analysis of the de-trended variables indicates no stabilizing effect in 11 of the 41 countries that have a counter-cyclical REM.

The stabilizing or destabilizing impact of the various capital inflows may depend not only on their stochastic behavior, but also on their share in GDP.[9] Examining the 37 countries with share of remittances in GDP higher than the mean value of 5.75 % (Table 1), we find REM and GDP to be positively correlated in 29 countries. Of these, REM is destabilizing in 19, has no impact in 6, and is stabilizing in 4. In other words, REM is not destabilizing in one third of the countries where REM is pro-cyclical. Based on the de-trended variables, the results indicate that among the 10 countries with counter-cyclical REM, for 5 there is stabilization, for 2 - no effect, and for 3 - a de-stabilizing impact. Thus, based on de-trended variables, REM is only stabilizing in 50% of the countries where it is counter-cyclical.

Our results about the stabilizing impact of remittances come at odds with the negative and significant coefficient of remittances found by IMF (2005) in the regression explaining output volatility. However, the volatility definition used in that study consists of the standard deviation of output growth, while we define it as the coefficient of variation over the period examined. Moreover, the IMF study measures remittances using the remittances/GDP ratio, hence the finding of a negative impact might be due to the fact that this ratio would be negatively correlated with GDP even in the case where remittances were constant and possibly even if remittances were pro-cyclical. On the other hand, we use for each individual country the actual level of remittances rather than its ratio to GDP.

5. Conclusions

That remittances are a stable and growing source of foreign exchange and are more stable than foreign direct investment (FDI) and official development aid (ODA) flows seems to have become the received wisdom. To check this and other findings in the previous literature, this study investigated the stability, cyclicality and stabilizing impact of remittances, FDI and ODA. Both at the country and aggregate levels, it was found that REM is less stable than ODA, but more stable than FDI. Second, while ODA is counter-cyclical in 54% of the countries (43% according to analysis based on de-trended indicators), remittances and FDI are pro-cyclical in between 80%

[9] Acosta et al (2008) show that the inequality-reducing effects of remittances are comparatively larger in countries where remittances represent a higher share of income.

and 90% of the countries examined (65% and 69% if variables are de-trended). Similarly, ODA is stabilizing in a majority of countries, while REM is destabilizing or has no effect in more than three-quarters of the countries and FDI in close to 90% of the countries. In addition, the stability of ODA (FDI) decreases (increases) with countries' income, REM and FDI are more pro (ODA is more counter)–cyclical in the lower and upper middle income groups than in the low income group, and the stabilizing impact of REM (ODA) increases (falls) with countries' income. Finally, adding ODA to REM+FDI (REM to FDI+ODA, and FDI to REM+ODA) reduces (raises) the pro-cyclicality and raises (reduces) the stabilizing impact of these flows.

Though, as documented in a large part of the literature, remittances increase at times of major upheavals such as natural disasters, armed conflicts or economic crises in migrants' source countries, we find them to be pro-cyclical as well as destabilizing for a majority of developing countries over large periods of times (1980 to 2007 in our analysis). Moreover, adding REM to FDI and ODA inflows raises the pro-cyclicality of these inflows as well as their destabilizing impact. Our results at this stage convey a cautiousness message, suggesting that the stabilizing virtues of remittances inflows be examined on a country-by-country basis. Explaining the patterns in the observed behavior of remittances and other inflows requires further empirical examination. The objective of this paper was to simply provide evidence on the behavior of remittances, as well as ODA and FDI. The examination of the motives underlying it, its determinants or its impact is on our research agenda.

It could be argued that there might be a problem with our conclusions being drawn solely based on the examination of formal remittance flows, while informal channels are estimated by the researchers to still attract about 50% of remittances (Ratha, 2006). However, all studies dealing with remittances only use official remittance data because of the lack of data on informal remittances. Consequently, the cyclical behavior of informal remittances cannot be ascertained, and neither is it possible to know the impact of including informal remittances on our findings. This lack of data obviously plagues the findings of all remittance studies.

As a final comment, whether REM flows are pro- or counter-cyclical and stabilizing or not, their impact might also depend on their importance relative to GDP and other sources of inflows. However, even though REM may be small as a share of GDP, it may amount to a large share of the income of recipient households and may therefore have a substantial impact on the stability of these households' income. This issue will also be studied in future work.

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TABLES

Table 1. Summary statistics

	a. statistics of indicators by country and year					b. statistics of country averages				
Variables (%)	Obs	Mean	Median	Std. Dev.	Max	Obs	Mean	Median	Std. Dev.	Max
REM/GDP	2304	5.58	2.13	12.43	94.18	116	5.76	2.67	9.70	79.43
FDI/GDP	2304	3.29	1.79	5.50	86.24	116	3.58	2.61	3.52	14.57
ODA/GDP	2304	8.78	4.57	11.48	93.83	116	9.61	5.61	11.81	76.95

Table 2. Stability of Capital Flows by Groups: Averages of Country Coefficients of Variation, 1980-2007

a. Simple average

	REM	FDI	ODA
ALL DEVELOPING COUNTRIES	0.75	1.47	0.47
East Asia and Pacific	0.78	1.49	0.44
Europe and Central Asia	0.82	1.04	0.39
Latin America and the Caribbean	0.90	0.86	0.56
Middle East and North Africa	0.31	1.67	0.54
South Asia	0.58	1.11	0.32
Sub-Saharan Africa	0.75	2.16	0.46
Low income	0.82	1.88	0.38
Lower middle income	0.73	1.35	0.42
Upper middle income	0.72	1.20	0.62

b. GDP-weighted average

	REM	FDI	ODA
ALL DEVELOPING COUNTRIES	0.94	1.12	0.55
East Asia and Pacific	1.36	0.98	0.53
Europe and Central Asia	0.64	1.13	0.55
Latin America and the Caribbean	0.93	0.95	0.60
Middle East and North Africa	0.31	1.67	0.54
South Asia	0.67	1.40	0.36
Sub-Saharan Africa	0.87	1.78	0.61
Low income	0.91	1.81	0.66
Lower middle income	1.12	1.16	0.45
Upper middle income	0.79	1.02	0.62

Table 3. Stability: Percentage of Countries with More Stable Inflow A than B*, 1980-2007

	Number of countries	series A		
		REM	REM	ODA
		series B		
		ODA	FDI	FDI
ALL DEVELOPING COUNTRIES	116	27%	72%	91%
East Asia and Pacific	15	13%	67%	87%
Europe and Central Asia	20	20%	60%	95%
Latin America and the Caribbean	28	29%	61%	93%
Middle East and North Africa	10	70%	100%	80%
South Asia	6	17%	83%	83%
Sub-Saharan Africa	37	24%	81%	95%
low income	36	17%	75%	94%
lower middle income	45	20%	73%	93%
upper middle income	35	46%	69%	86%

*Stability measured by CV

Table 4. Cyclicality: Averages of Country-Level Correlation Coefficients between Various Inflows and GDP, 1980-2007

a. Simple average

	REM	FDI	ODA	REM+FDI+ ODA
ALL DEVELOPING COUNTRIES	0.50	0.52	-0.02	0.52
East Asia and Pacific	0.52	0.50	-0.20	0.46
Europe and Central Asia	0.67	0.64	0.14	0.70
Latin America and the Caribbean	0.68	0.60	-0.11	0.68
Middle East and North Africa	0.32	0.51	-0.17	0.32
South Asia	0.59	0.52	-0.28	0.65
Sub-Saharan Africa	0.30	0.42	0.13	0.35
Low income	0.33	0.40	0.19	0.39
Lower middle income	0.58	0.57	-0.18	0.54
Upper middle income	0.57	0.60	-0.03	0.62

b. GDP-weighted average

	REM	FDI	ODA	REM+FDI+ ODA
ALL DEVELOPING COUNTRIES	0.66	0.71	-0.20	0.73
East Asia and Pacific	0.82	0.82	-0.30	0.86
Europe and Central Asia	0.12	0.71	-0.23	0.67
Latin America and the Caribbean	0.83	0.68	-0.12	0.75
Middle East and North Africa	0.12	0.45	-0.20	0.21
South Asia	0.83	0.85	-0.67	0.86
Sub-Saharan Africa	0.72	0.46	0.56	0.51
Low income	0.43	0.62	0.10	0.56
Lower middle income	0.77	0.78	-0.36	0.80
Upper middle income	0.60	0.67	-0.11	0.69

Table 5. Cyclicality: Percentage of Countries for which Inflow A is Negatively Correlated with GDP, 1980-2007

	Number of countries	A			
		REM	FDI	ODA	REM+FDI+ODA
ALL DEVELOPING COUNTRIES	116	21%	11%	54%	16%
East Asia and Pacific	15	7%	13%	80%	20%
Europe and Central Asia	20	10%	10%	40%	5%
Latin America and the Caribbean	28	7%	4%	64%	4%
Middle East and North Africa	10	40%	10%	70%	30%
South Asia	6	33%	17%	67%	17%
Sub-Saharan Africa	37	35%	16%	38%	24%
low income	36	28%	19%	33%	22%
lower middle income	45	18%	9%	67%	20%
upper middle income	35	17%	6%	60%	3%

Table 6. Cyclicality: Averages of Country-Level Correlation Coefficients between Various Inflows and GDP, 1980-2007, Hodrick-Prescott de-trending

a. Simple average

	REM	FDI	ODA	REM+FDI+ODA
ALL DEVELOPING COUNTRIES	0.08	0.14	0.00	0.11
East Asia and Pacific	0.13	0.12	-0.05	0.14
Europe and Central Asia	0.25	0.17	0.03	0.18
Latin America and the Caribbean	0.02	0.14	-0.02	0.12
Middle East and North Africa	0.11	0.13	0.02	0.15
South Asia	-0.01	0.35	-0.14	-0.21
Sub-Saharan Africa	0.03	0.09	0.04	0.08
Low income	-0.01	0.10	0.04	0.03
Lower middle income	0.16	0.16	-0.04	0.11
Upper middle income	0.08	0.14	0.02	0.18

b. GDP-weighted average

	REM	FDI	ODA	REM+FDI+ODA
ALL DEVELOPING COUNTRIES	0.12	0.29	0.02	0.28
East Asia and Pacific	0.32	0.56	0.00	0.55
Europe and Central Asia	0.36	0.22	0.03	0.27
Latin America and the Caribbean	-0.06	0.17	0.06	0.16
Middle East and North Africa	0.11	0.24	0.10	0.26
South Asia	-0.03	0.31	-0.04	0.15
Sub-Saharan Africa	-0.11	0.05	-0.12	0.08
Low income	-0.09	0.06	-0.01	-0.06
Lower middle income	0.23	0.43	0.01	0.41
Upper middle income	0.06	0.20	0.03	0.21

Table 7. Cyclicality: Percentage of Countries for which Inflow A is Negatively Correlated with GDP, 1980-2007, Hodrick-Prescott de-trending

	Number of countries	A			
		REM	FDI	ODA	REM+FDI+ODA
ALL DEVELOPING COUNTRIES	116	35%	31%	43%	32%
East Asia and Pacific	15	20%	40%	53%	40%
Europe and Central Asia	20	15%	30%	35%	25%
Latin America and the Caribbean	28	50%	18%	50%	29%
Middle East and North Africa	10	40%	40%	40%	20%
South Asia	6	33%	17%	67%	50%
Sub-Saharan Africa	37	41%	38%	35%	35%
low income	36	44%	36%	33%	39%
lower middle income	45	27%	31%	58%	33%
upper middle income	35	37%	26%	34%	23%

Table 8. Stabilizing Impact: Percentage of Countries for which Capital Inflow A is Stabilizing, 1980-2007*

	Number of countries	A			
		REM	FDI	ODA	REM+FDI+ ODA
ALL DEVELOPING COUNTRIES	116	20%	11%	56%	30%
East Asia and Pacific	15	7%	13%	60%	27%
Europe and Central Asia	20	15%	10%	50%	10%
Latin America and the Caribbean	28	7%	4%	46%	11%
Middle East and North Africa	10	50%	0%	60%	50%
South Asia	6	17%	0%	83%	50%
Sub-Saharan Africa	37	30%	22%	59%	49%
low income	36	25%	17%	61%	44%
lower middle income	45	22%	7%	62%	31%
upper middle income	35	11%	11%	43%	14%

* CV(A)<CV(GDP)

APPENDIX

TABLE A1. Countries by Region and Income Group

	East Asia and Pacific	Europe and Central Asia	Latin America and the Caribbean	Middle East and North Africa	South Asia	Sub-Saharan Africa
Low income	Cambodia Lao PDR Papua New Guinea Solomon Islands	Kyrgyz Republic Tajikistan	Haiti	Yemen, Rep.	Bangladesh Nepal Pakistan	Benin Burkina Faso Central African Rep. Chad Comoros Cote d'Ivoire Ethiopia Gambia, The Ghana Guinea-Bissau Kenya Madagascar Malawi Mali Mauritania Mozambique Niger Nigeria Rwanda Senegal Sierra Leone Tanzania Togo Uganda Zimbabwe
Lower middle income	China Indonesia Kiribati Mongolia Philippines Samoa Thailand Tonga Vanuatu	Albania Armenia Azerbaijan Bosnia and Herzegovina Georgia Macedonia, FYR Moldova Ukraine	Bolivia Colombia Dominican Rep. Ecuador El Salvador Guatemala Guyana Honduras Nicaragua Paraguay Peru	Algeria Djibouti Egypt, Arab Rep. Jordan Morocco Syrian Arab Rep. Tunisia	India Maldives Sri Lanka	Cameroon Cape Verde Congo, Rep. Lesotho Namibia Sudan Swaziland
Upper middle income	Fiji Malaysia	Belarus Bulgaria Croatia Kazakhstan Latvia Lithuania Poland Romania Russian Federation Turkey	Argentina Belize Brazil Chile Costa Rica Dominica Grenada Jamaica Mexico Panama St. Kitts and Nevis St. Lucia St. Vincent and the Grenadines Suriname Uruguay Venezuela, RB	Lebanon Libya		Botswana Gabon Mauritius Seychelles South Africa

Table A2. Cyclicality: Averages of Country-Level Correlation Coefficients between Pairs of Inflows and GDP, 1980-2007

a. Simple average

	REM+FDI	REM+ODA	FDI+ODA
ALL DEVELOPING COUNTRIES	0.57	0.39	0.42
East Asia and Pacific	0.53	0.37	0.35
Europe and Central Asia	0.72	0.60	0.61
Latin America and the Caribbean	0.70	0.56	0.55
Middle East and North Africa	0.45	0.14	0.27
South Asia	0.76	0.57	0.20
Sub-Saharan Africa	0.41	0.20	0.33
Low income	0.44	0.31	0.30
Lower middle income	0.61	0.45	0.41
Upper middle income	0.65	0.40	0.56

b. GDP-weighted average

	REM+FDI	REM+ODA	FDI+ODA
ALL DEVELOPING COUNTRIES	0.75	0.60	0.67
East Asia and Pacific	0.87	0.74	0.79
Europe and Central Asia	0.71	-0.02	0.67
Latin America and the Caribbean	0.75	0.82	0.68
Middle East and North Africa	0.34	0.01	0.24
South Asia	0.89	0.80	0.64
Sub-Saharan Africa	0.51	0.68	0.45
Low income	0.60	0.42	0.38
Lower middle income	0.83	0.70	0.72
Upper middle income	0.70	0.54	0.65

Table A3. Cyclicality: Percentage of Countries for which Capital Inflow A is Negatively Correlated with GDP, 1980-2007

	Number of countries	A		
		REM+FDI	REM+ODA	FDI+ODA
ALL DEVELOPING COUNTRIES	116	12%	26%	16%
East Asia and Pacific	15	13%	33%	20%
Europe and Central Asia	20	5%	15%	5%
Latin America and the Caribbean	28	4%	14%	4%
Middle East and North Africa	10	20%	40%	30%
South Asia	6	0%	33%	33%
Sub-Saharan Africa	37	22%	32%	22%
low income	36	22%	28%	25%
lower middle income	45	11%	27%	18%
upper middle income	35	3%	23%	3%

Table A4. Cyclicality: Averages of Country-Level Correlation Coefficients between Inflows and GDP, 1980-2007, Hodrick-Prescott de-trending

a. Simple average

	REM+FDI	REM+ODA	FDI+ODA
ALL DEVELOPING COUNTRIES	0.15	0.05	0.10
East Asia and Pacific	0.17	0.06	0.09
Europe and Central Asia	0.18	0.20	0.16
Latin America and the Caribbean	0.15	-0.03	0.12
Middle East and North Africa	0.17	0.12	0.08
South Asia	0.11	-0.31	-0.03
Sub-Saharan Africa	0.13	0.06	0.08
Low income	0.09	0.01	0.07
Lower middle income	0.18	0.06	0.09
Upper middle income	0.17	0.08	0.15

b. GDP-weighted average

	REM+FDI	REM+ODA	FDI+ODA
ALL DEVELOPING COUNTRIES	0.29	0.11	0.28
East Asia and Pacific	0.57	0.30	0.53
Europe and Central Asia	0.28	0.29	0.21
Latin America and the Caribbean	0.16	-0.03	0.17
Middle East and North Africa	0.25	0.16	0.23
South Asia	0.18	-0.05	0.24
Sub-Saharan Africa	0.09	-0.13	0.08
Low income	-0.04	-0.09	0.02
Lower middle income	0.43	0.22	0.41
Upper middle income	0.22	0.04	0.19

Table A5. Cyclicality: Percentage of Countries for which Inflow A is Negatively Correlated with GDP, 1980-2007, Hodrick-Prescott de-trending

	Number of countries	A		
		REM+FDI	REM+ODA	FDI+ODA
ALL DEVELOPING COUNTRIES	116	30%	36%	33%
East Asia and Pacific	15	40%	40%	40%
Europe and Central Asia	20	25%	15%	30%
Latin America and the Caribbean	28	25%	50%	29%
Middle East and North Africa	10	30%	30%	30%
South Asia	6	33%	67%	50%
Sub-Saharan Africa	37	32%	32%	32%
low income	36	36%	42%	33%
lower middle income	45	31%	36%	36%
upper middle income	35	23%	31%	29%

Table A6. Stabilizing Impact: Percentage of Countries for which Capital Inflow A is Stabilizing, 1980-2007*

	Number of countries	A		
		REM+FDI	REM+ODA	FDI+ODA
ALL DEVELOPING COUNTRIES	116	19%	41%	32%
East Asia and Pacific	15	20%	33%	40%
Europe and Central Asia	20	5%	20%	15%
Latin America and the Caribbean	28	7%	29%	11%
Middle East and North Africa	10	40%	70%	30%
South Asia	6	33%	50%	50%
Sub-Saharan Africa	37	27%	57%	51%
low income	36	25%	50%	53%
lower middle income	45	20%	40%	27%
upper middle income	35	11%	34%	17%

* CV(A)<CV(GDP)