Remittances, FDI and ODA: stability, cyclicality and stabilising impact in developing countries

Ileana C. Constantinescu*

Development Economics Research Group,
The World Bank,
MC3-303, 1818 H Street, NW,
Washington, DC 20433, USA
E-mail: ineagu@worldbank.org
*Corresponding author

Maurice Schiff

Institute for the Study of Labor (IZA),
Schaumburg-Lippe-Strasse 5-9,
53113 Bonn, Germany
E-mail: schiffmaurice@yahoo.com

Abstract: Received wisdom that remittances are stable is based on global rather than individual country figures. And findings in a majority of studies that remittances are counter-cyclical are not based on individual country analysis. This paper fills this knowledge gap by examining, for 116 developing countries over three decades (1980–2007), the stability, cyclicality and stabilising impact of remittances (REM), official development aid (ODA) and FDI, obtaining new results. Note that these flows can be both counter-cyclical *and* destabilising. Findings for a majority of countries, regions and income groups are: 1) ODA is more stable than REM, which is more stable than FDI; 2) ODA is counter-cyclical and REM is pro-cyclical, though less than FDI; 3) ODA is stabilising and REM destabilising, though less than FDI; 4) counter-(pro-)cyclical ODA, REM and FDI flows are destabilising (stabilising) in a substantial number of countries, regions and income groups.

Keywords: remittances; foreign direct investment; FDI; official development aid; ODA; stability; cyclicality; stabilising impact.

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Biographical notes: Ileana C. Constantinescu has a PhD from Université Catholique de Louvain. Her research experience encompasses several areas of international economics, including trade in services, migration, and trade policy. While working for the International Trade Unit of the World Bank Development Research Group she contributed to a number of papers, some of which were published in journals such as *Journal of International Economics*, *Journal of Development Economics* and *World Bank Economic Review*.

Maurice Schiff obtained his PhD from the University of Chicago. He spent two years as Professor and Research Director of the Faculty of Economics and Business of the University of Concepcion in Chile. He then served as a Lead Economist in the World Bank International Trade Unit (Development Research Group) where he directed various Research Programs, including The Political Economy of Agricultural Pricing Policy, Regional Integration and Development, and International Migration and Development. His fields of expertise are international trade, agriculture, regional integration, trade and technology diffusion, and international migration. He published more than ten books and a large number of articles in journals such as *Journal of International Economics*, *European Economic Review*, *World Bank Economic Review*, *Journal of Development Economics*, *American Journal of Agricultural Economics*, *Canadian Journal of Economics*, and more. etc.

1 Introduction[1]

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). India, China, and Mexico are the largest recipients, while many small states (e.g., Tajikistan, Tonga, Moldova) lead in terms of the share of remittances in GDP. Among factors considered that have triggered this rapid growth are increases in international migration, as well as reduced cost and greater convenience of transferring money through formal channels.[2] The rapid growth of remittances has led researchers to evaluate their role as a source of foreign exchange and as a buffer for macroeconomic shocks and output volatility.

The financial crisis in developed countries and global economic crisis that followed and is still ongoing has led to a reversal in the two-decade long growth of remittances. Thus, the initial shock of the crisis for developing countries may have been exacerbated by its impact on remittance flows. Whether volatility was exacerbated hinges on whether remittances have a stabilising or destabilising impact on the recipient countries. Thus, it would seem timely to provide a fresh look at this issue.

The relationship between remittances and aggregate output often hides a great deal of heterogeneity at the country, regional and income-group level, an issue that has not been systematically examined in the literature. Country-level studies do not provide an overall picture of the country-level situation for a large number of countries, while empirical work focusing on the determinants of remittances or on their macroeconomic impact tend to constrain the estimated effects to be the same for all sample countries. An exception is Chami et al. (2005) who examine the determinants of remittances per GDP at country level. They find a negative coefficient on the income gap of the recipient country with respect to the USA for 29 (59%) of the 49 sample countries, and the opposite for 20 (41%) of them.[3]

This paper contributes to the literature in several ways. First, it examines the stability, cyclicality and stabilising impact of remittances at the country, regional and income-group level. Second, as results are likely to differ across different sources of foreign capital inflows, the paper examines the performance of foreign direct investment (FDI) and official development aid (ODA) inflows as well. Moreover, since FDI and REM are private capital flows while ODA is provided publicly, it seems useful to

compare ODA's performance in stabilising recipient countries' economies with that of REM and FDI. Third, various studies have examined the cyclicality of various sources of capital inflows while other ones have examined their stabilising impact. This paper examines both since a counter- (pro-) cyclical inflow is not necessarily stabilising (destabilising). Fourth, we also examine the impact of the sum of these inflows and the marginal impact of each inflow. Fifth, the analysis is conducted for a larger number of countries than in other studies and for a long period of time.

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 is more stable than FDI in 72% of them, a result confirmed by the sample average coefficients of variation (CV), which are .47 for ODA, .75 for REM and 1.47 for FDI. As for cyclicality, the results indicate that ODA is counter-cyclical and REM is pro-cyclical though less than FDI. Thus, our findings about REM's cyclicality differ from those obtained in most studies on the topic. Also, as shown in Section 4.3, a counter- (pro-) cyclical inflow does not necessarily imply that it is stabilising (destabilising). We find that ODA has a stabilising impact in 56% of the countries examined, REM in only 20% and FDI in barely 10%.

The paper is organised as follows: Section 2 reviews prior literature, Section 3 describes the data, Section 4 presents the empirical results and Section 5 concludes. The Appendix provides additional information of the various relationships as well as the list of countries included.

2 Selected literature review

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

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 FDI, capital non-FDI flows and ODA. That 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 (ex. Buch and Kuckulenz, 2004; IMF, 2005).

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 by absorbing macroeconomic shocks. To that goal, many studies attempted to determine the behaviour of remittances in response to fluctuation in 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. One of them emphasises the altruistic motive. Under this assumption, the welfare of distant relatives and friends is a component of migrants' own utility function (Rapoport and Docquier, 2006; Niimi et al., 2010), hence remittances are expected to behave counter-cyclically, with migrants remitting more during times of economic hardship in the origin countries. Another theory holds that migrants optimise 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 de Rezende Rocha (1992) for a detailed review.

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 Mohapatra et al. (2009) based on 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 and Ruiz-Arranz (2006) obtain that for the eleven countries in their analysis remittances do not seem to increase in the wake of natural disasters. Furthermore, Ratha (2003) indicates that remittance receipts actually 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.

As for the empirical literature examining the cyclicality direction of remittances in relation to macroeconomic indicators, the conclusions are also mixed. In support of the counter-cyclical response, Mishra (2005) finds for 13 Caribbean countries that a 1% decrease in real GDP leads to a 3% 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. Chami et al. (2005) obtain that the share of remittances in GDP is negatively correlated with the income gap of the home countries with respect to the USA. Frankel (2009) also provides evidence of a counter-cyclical response for remittances. Giuliano and Ruiz-Arranz (2005) find positive correlations between the cyclical components of REM and GDP in two thirds of the approximately 100 countries they analyse, testifying for even more occurrences of such

pro-cyclicality in countries with shallower financial systems. More evidence of pro-cyclicality is provided in Lueth and Ruiz-Arranz (2006).

Examining the determinants of remittances using a panel estimation based on data for 101 countries during 1970–2003, IMF (2005) finds a significant negative impact of home country output on remittances per GDP. However, examination in the same study of the correlations between GDP and aggregate remittances as well as other inflows indicates that remittances are positively correlated with GDP, hence pro-cyclical, although not as much as the non-FDI capital inflows.

Acosta et al. (2008) calculate 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 this analysis to other developing countries reveals great country group heterogeneity in the sensitivity of remittances to oscillations in the real output. The aggregated detrended remittances sent to the 12 countries examined in Sayan (2006) are also negatively correlated with detrended 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.

2.3 Stabilisation

The general perception arising from the literature seems to be that counter-cyclicality coupled with stability automatically implies the ability to buffer macroeconomic shocks. Few studies have actually estimated the impact of remittances on output volatility directly. All of them measure output volatility as the standard deviation of the annual GDP growth rate.

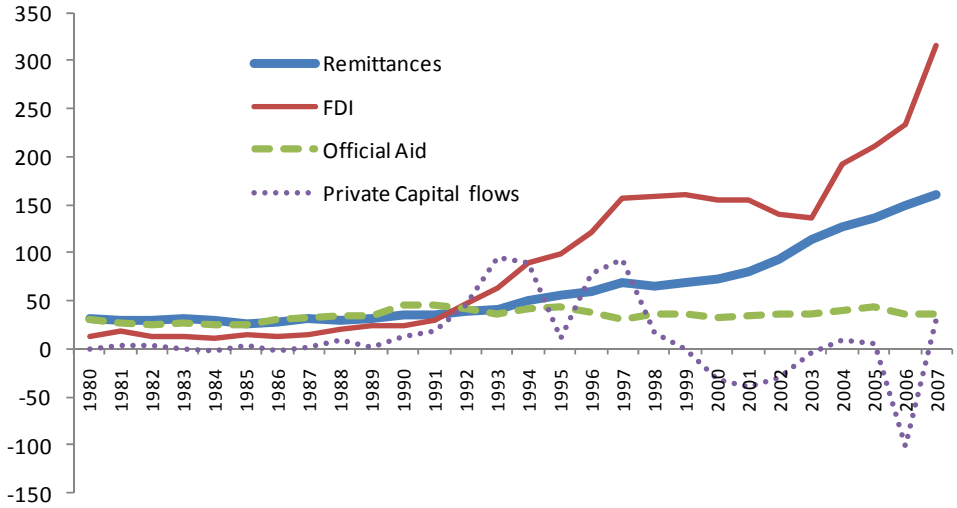
IMF (2005) finds that "a 2.5 percentage point increase in the remittances/GDP ratio is on average associated with a one-sixth decline in aggregate output volatility". Acosta et al.'s (2008) study shows that "countries with larger remittances flows (as a percentage of GDP) tend to have less volatile real output fluctuations", with one standard deviation increase in remittances reducing the standard deviation of growth in real output per capita by more than 10%. Bugamelli and Paterno (2011) also find a negative effect of migrants' remittances on output volatility, in an empirical framework that controls for endogeneity. Similar conclusions are reached by World Bank (2006), Chami et al. (2008)[4] and Chami et al. (2009). The latter study also finds that the impact of remittances on output volatility becomes weaker beyond a remittance to GDP ratio of two percent. The intuition provided for this finding is that high remittance-to-GDP ratios may increase output volatility due to the negative impact on labour supply of remittance-dependent households.

3 Data

We use the following indicators: remittances (REM), FDI defined as net inflows, 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 are from the World Bank's World Development Indicators (WDI) (various years). FDI is comprised of equity capital, reinvested earnings and other claims/liabilities on/to direct investors. Variables are expressed in US million dollars. The US GDP deflator is used to convert remittances, ODA and FDI values from current US dollars into

constant 2000 US dollars. Figure 1 highlights the evolution of the three series we focus on, together with private capital flows.

Figure 1 Foreign exchange inflows over time (billion us dollars) (see online version for colours)



Our sample covers the period 1980–2007. It includes 116 developing countries of which 36 are low income, 45 lower middle income and 35 upper middle income. Their geographic distribution is as follows: 15 countries from East Asia and Pacific (EAP), 20 from Europe and Central Asia (ECA), 28 from Latin America and the Caribbean (LAC), ten from the Middle East and North Africa (MENA), six 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.

4 Empirical results: REM, FDI and ODA

Several studies have based their analysis of the stability and cyclicality of the various inflows on actual values (e.g., Ratha, 2003). An important issue that must be addressed before turning to the empirical results is whether to use the same measure of these or the per capita, detrended, or ratio of values (or other).

4.1 Stability

In order to evaluate the stability of remittances, ODA and FDI, we calculate the coefficient of variation (CV) for the period 1980–2007 for each indicator by country. Additionally, we provide simple and GDP-weighted average values of the CV for the 116 sample countries as well as for the various geographic regions and income level groups.

The average of the CV for various aggregations is presented in Table 1. 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 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 analysed (Egypt, Jordan, Lebanon, Libya, Morocco, Syria, Djibouti and Yemen). The exceptions are Tunisia and Algeria.

Panel b shows 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, with CV = 1.57 (but also the highest income relative to the other EAP and lower middle income countries.

Table 1 Stability of capital flows by country groups, 1980–2007

	REM	*FDI*	*ODA*
a. Simple average			
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			
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

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 were it not for Nigeria, whose relative economic

importance and high CV (raise 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 2 summarises 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 CV – 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 1 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. Most MENA countries considered in this study experienced more stable REM than ODA during the analysed period.

Table 2 Stability: percentage of countries with more stable inflow A than B*, 1980–2007

	Number of countries	*series A*		
		REM	*REM*	*ODA*
		vs. 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%

Note: *Stability measured by CV.

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 characterised 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 stabilising impact) and detrended 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 three 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 3 is based on original (non-detrended) 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).

Table 3 Cyclicality: averages of country-level correlation coefficients between various inflows and GDP, 1980–2007

	REM	*FDI*	*ODA*	*REM + FDI + ODA*
	a. Simple average			
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			
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

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 3 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.

Table 4 Cyclicality: percentage of countries for which inflows are negatively correlated with GDP, 1980–2007

	Number of countries	*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%

The share of countries with the non-detrended indicators of interest negatively correlated with GDP is provided in Table 4.[5] 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 3 and 4 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.[6] 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 3, 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 4, 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.

Finally, comparison of the last columns in Table 3 to Appendix Table A2, as well as of the last column in Table 4 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.

Table 5 Cyclicality: averages of country-level correlation coefficients between various inflows and GDP, 1980–2007, Hodrick-Prescott detrending

	REM	*FDI*	*ODA*	*REM + FDI + ODA*
	a. Simple average			
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			
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

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 detrended based on Hodrick-Prescott's method. Table 5 (A4) is the counterpart of Table 3 (A2) in that it presents the coefficients of correlation aggregated by regions and groups, while Table 6 (A5) mirrors Table 4 (A3) by indicating the percentage of countries for which detrended flow A is counter-cyclical.

The results in Tables 5 and 6 weaken, but do not invalidate the conclusions reached using the analysis of the non-detrended indicators. Thus, the coefficients of correlation presented in Table 5 are closer to zero than the ones in Table 3, 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 6), ODA's counter-cyclicality is much less obvious in both Table 5, where most coefficients reported by panel b are positive, and in Table 6, 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 6: 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%).

Table 6 Cyclicality: percentage of countries for which inflows are negatively correlated with GDP, 1980–2007, Hodrick-Prescott detrending

	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%

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 detrended 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).

One last question to address in this section before moving forward is to what extent the country-specific correlation indices we have analysed so far are significant. Table A6 depicts the percentages of countries for which the coefficients of correlation between GDP and each of the three series REM, FDI and ODA are

a positive and significant

b positive and not significant

c negative and significant

d negative and not significant.

Panel a is based on the original series, and panel b on detrended ones. Not surprisingly, due to the lack of variation introduced by the fact that correlations are calculated for each country, the shares of non- significant coefficients are quite large, especially for the case of detrended variables. Nevertheless, analysing only the figures in the columns corresponding to the significantly positive and negative coefficients, we still find that ODA is counter-cyclical in most cases, while REM and FDI are more pro-cyclical, with the pro-cyclicality of FDI being more pronounced compared to that of REM.

4.3 Stabilising impact

We examine now whether or not the various external flows are stabilising. This differs from cyclicality, which looks at the relationship between annual changes in GDP and annual changes in these flows, while stabilisation looks at the impact of these flows on stability over the entire period. Table 7 presents the shares of countries for which REM, FDI, ODA and REM+FDI+ODA help decrease the variability of GDP measured by the CV. Appendix Table A7 provides the stabilising impact of REM + FDI, REM + ODA and FDI + ODA.

Table 7 Stabilising impact: percentage of countries for which external inflows are stabilising, 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%

Note: *$CV(A) < CV(GDP)$.

The results depict ODA as the most stabilising of the three inflows (stabilising 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' stabilising impact, we observe that adding ODA to REM + FDI increases the stabilising impact of these inflows, i.e., ODA + REM + FDI is more stabilising than REM + FDI, while adding REM to FDI + ODA and adding FDI to REM + ODA decreases it. In fact, ODA + REM + FDI is

stabilising in close to twice as many countries as REM + FDI (30% vs. 19%). Interestingly, the stabilising 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 4 and 6, it appears that ODA is both counter-cyclical and stabilising, REM is mostly pro-cyclical and destabilising, while FDI is more pro-cyclical and more destabilising than REM.

Note that it is possible for the $CV(X + GDP)$ to be larger (smaller) than $CV(GDP)$ even if X is counter-(pro-)cyclical (X = REM, ODA or FDI). This suggests it is necessary to consider the issues of cyclicality and stabilisation separately. While the two features seem to indeed go together in most cases, it need not hold in theory and in fact does not hold for a number of countries.

We say that an external inflow X (X = *ODA, FDI* or remittances R) is stabilising (destabilising) if the CV of $(GDP + X)$ is smaller (larger) than that of GDP, i.e., if $CV(GDP + X) <(>) CV(GDP)$. Since $Var(GDP + X) = Var(GDP) + Var(X) + 2cov(GDP, X)$, it follows that $Var(GDP + X) >(<) Var(GDP) \leftrightarrow Var(X) + 2cov(GDP, X) >(<) 0$. 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 stabilising 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 destabilising at the same time. A possible though less likely scenario is for X to be pro-cyclical as well as stabilising. In this case, $CV(GDP + X) > 0$, and since $Var(X) > 0$, it follows that $Var(GDP + X) > Var(GDP)$. Nevertheless, it is possible for X to be stabilising, i.e., for to be smaller than (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 may also indicate whether remittances are stabilising or not in most cases, though certainly not in all of them. Counter-cyclical remittances (or other sources of external inflows) may be destabilising, though the latter situation would seem to be less likely. In our data, it 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 6), although REM is more stabilising than FDI in three times as many countries (22% for REM as opposed to 7% for FDI in Table 7). As another example, ODA is counter-cyclical in only one third of the low-income group of countries, but stabilising in 61% of these countries. This difference suggests the presence of a substantial number of countries where greater counter-cyclicality for ODA is not related to a stabilising impact of ODA. Furthermore, the analysis of the detrended variables indicates no stabilising effect in 11 of the 41 countries that have counter-cyclical REM. Furthermore, of the 92 countries with pro-cyclical REM, a stabilising effect is present in nine of them.

Our results about the stabilising impact of remittances are at odds with the negative and significant coefficient of remittances found by previous studies in regressions explaining output volatility. However, the volatility definition used in many of those

studies consists of the standard deviation of output growth, while we define it as the CV over the period examined. Moreover, they measure remittances using the remittances/GDP ratio and this ratio is negatively correlated with GDP when remittances are constant (and possibly even when remittances are 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 FDI and 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 stabilising 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 detrended indicators), remittances are counter-cyclical in only 21% (35%) and FDI in 11% (31%) of the countries. Similarly, ODA is stabilising in a majority of countries, while REM is stabilising in less than 25% of the countries and FDI in about 10% 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 stabilising 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 stabilising 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 destabilising for a majority of developing countries over longer periods of times (1980 to 2007 in our analysis). Moreover, adding remittances to FDI and ODA inflows raises the pro-cyclicality of these inflows as well as their destabilising impact.

Most studies on the impact of remittances and/or on a comparison of the impact of remittances (REM) and ODA, REM and FDI, or of REM, ODA and FDI, have been conducted either at the global or regional level (including cross-country studies). Individual country studies do exist but these are more limited and have used different methodologies, time periods and variables examined (e.g., income level or growth). None have done so systematically for a majority of developing countries (116 countries). The objective of this paper was to provide systematic evidence on the behaviour of remittances, as well as ODA and FDI on a country-by-country basis, since this is the level that matters from the policy viewpoint. Explaining the patterns in the observed behaviour of remittances and other inflows requires further empirical examination. The examination of the determinants and impact of these inflows is on our research agenda.[7]

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Notes

1 An early version of the paper is Constantinescu-Neagu and Schiff (2009).

2 Improved measurement and reporting of remittances in Balance of Payments statistics have also contributed to this.

3 As discussed in Section 2, Chami and his colleagues have made a number of important contributions to this and related issues (e.g., Chami et al., 2008, 2009).

4 Chami et al. (2008) provides a useful review of the remittances literature by areas of research: determinants of remittances, impact at microeconomic level, impact at macroeconomic level (output growth, output volatility, etc).

5 Indices of correlation by country are available from the authors upon request.

6 With respect to remittances, this finding is in contrast to Acosta et al. (2008) who obtain that "at least among developing countries, the counter-cyclicality of remittances appears to increase with income, being highest among upper middle-income countries".

7 A limitation of the analysis provided is that it is based solely on formal remittances, even though informal channels are estimated to have attracted a significant share of all remittances in 2000–2005 (Ratha, 2006). This problem has of course plagued all remittance studies because of the lack of data on informal remittances.

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	Kyrgyz Republic	Haiti	Yemen, Rep.	Bangladesh	Benin
	Lao PDR	Tajikistan			Nepal	Burkina Faso
	Papua New Guinea				Pakistan	Central African Rep.
	Solomon Islands					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

Table A1 Countries by region and income group (continued)

	East Asia and Pacific	*Europe and Central Asia*	*Latin America and the Caribbean*	*Middle East and North Africa*	*South Asia*	*Sub-Saharan Africa*
Lower middle income	China	Albania	Bolivia	Algeria	India	Cameroon
	Indonesia	Armenia	Colombia	Djibouti	Maldives	Cape Verde
	Kiribati	Azerbaijan	Dominican Rep.	Egypt, Arab Rep.	Sri Lanka	Congo, Rep.
	Mongolia	Bosnia and Herzegovina	Ecuador	Jordan		Lesotho
	Philippines	Georgia	El Salvador	Morocco		Namibia
	Samoa	Macedonia	Guatemala	Syrian Arab Rep.		Sudan
	Thailand	FYR	Guyana	Tunisia		Swaziland
	Tonga	Moldova	Honduras			
	Vanuatu	Ukraine	Nicaragua			
			Paraguay			
			Peru			
Upper middle income	Fiji, Malaysia	Belarus	Argentina	Lebanon		Botswana
		Bulgaria	Belize	Libya		Gabon
		Croatia	Brazil			Mauritius
		Kazakhstan	Chile			Seychelles
		Latvia	Costa Rica			South Africa
		Lithuania	Dominica			
		Poland	Grenada			
		Romania	Jamaica			
		Russian Federation	Mexico			
		Turkey	Panama			
			St. Kitts and Nevis			
			St. Lucia			
			St. Vincent and the Grenadines			
			Suriname			
			Uruguay			
			Venezuela, RB			

Table A2 Cyclicality: averages of country-level correlation coefficients between pairs of inflows and GDP, 1980–2007

	REM + FDI	*REM + ODA*	*FDI + ODA*
a. Simple average			
b. GDP-weighted average			
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 external inflows are 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 detrending

	REM + FDI	*REM + ODA*	*FDI + ODA*
a. Simple average			
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

Table A4 Cyclicality: averages of country-level correlation coefficients between inflows and GDP, 1980–2007, Hodrick-Prescott detrending (continued)

	REM + FDI	*REM + ODA*	*FDI + ODA*
b. GDP-weighted average			
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 inflows are negatively correlated with GDP, 1980–2007, Hodrick-Prescott detrending

	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 Cyclicality: share of countries by sign and significance of correlation

		REM				*FDI*				*AID*			
	Number of countries	*Positive*		*Negative*		*Positive*		*Negative*		*Positive*		*Negative*	
		Significant	*Not significant*	*Significant*	*Not significant*	*Significant*	*Not significant*	*Significant*	*Not significant*	*Significant*	*Not significant*	*Significant*	*Not significant*
a. Original series													
All developing countries	116	67%	12%	8%	13%	71%	18%	3%	8%	25%	21%	28%	27%
East Asia and Pacific	15	60%	33%	7%	0%	67%	20%	0%	13%	13%	7%	27%	53%
Europe and Central Asia	20	75%	15%	5%	5%	80%	10%	5%	5%	35%	25%	20%	20%
Latin America and the Caribbean	28	89%	4%	4%	4%	82%	14%	0%	4%	21%	14%	36%	29%
Middle East and North Africa	10	60%	0%	20%	20%	70%	20%	10%	0%	10%	20%	40%	30%
South Asia	6	67%	0%	0%	33%	67%	17%	17%	0%	0%	33%	50%	17%
Sub-Saharan Africa	37	51%	14%	11%	24%	59%	24%	3%	14%	35%	27%	19%	19%
Low income	36	50%	22%	14%	14%	56%	25%	6%	14%	36%	31%	11%	22%
Lower middle income	45	76%	7%	7%	11%	76%	16%	4%	4%	18%	16%	38%	29%
Upper middle income	35	74%	9%	3%	14%	80%	14%	0%	6%	23%	17%	31%	29%
b. Detrended series													
All developing countries	116	21%	44%	6%	29%	18%	48%	3%	31%	8%	49%	12%	31%
East Asia and Pacific	15	13%	67%	7%	13%	27%	33%	7%	33%	7%	40%	20%	33%
Europe and Central Asia	20	40%	45%	0%	15%	15%	50%	5%	30%	0%	65%	5%	30%
Latin America and the Caribbean	28	25%	25%	7%	43%	18%	61%	0%	21%	11%	39%	11%	39%
Middle East and North Africa	10	10%	50%	0%	40%	10%	50%	0%	40%	10%	50%	20%	20%
South Asia	6	33%	33%	33%	0%	50%	33%	0%	17%	0%	33%	17%	50%
Sub-Saharan Africa	37	11%	49%	5%	35%	14%	46%	3%	38%	11%	54%	11%	24%
Low income	36	11%	44%	11%	33%	8%	50%	3%	39%	11%	56%	17%	17%
Lower middle income	45	29%	44%	2%	24%	29%	40%	4%	27%	4%	38%	13%	44%
Upper middle income	35	20%	43%	6%	31%	14%	57%	0%	29%	9%	57%	6%	29%

Table A7 Stabilising impact: percentage of countries for which external inflows are stabilising, 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%

Note: *$CV(A) < CV(GDP)$.