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International Remittances to Sub-Saharan Africa, the Countercyclical Debate and Economic Crisis in the OECD Countries

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Abstract

Recent global economic crisis has added to the debate on whether remittance flows are countercyclical to economic conditions in receiving countries. An important question raised by the crisis is whether the countercyclical proposition holds true when remittance-sending countries are facing crisis. Drawing inference from Organisation for Economic Cooperation and Development (OECD) countries hit by the crisis, this paper finds that there is no uniform pattern on how macroeconomic indicators reflecting the intensity of the crisis could impact on remittance flows. It shows that flows to Sub-Saharan African (SSA) countries are countercyclical to per capital income in sending OECD country and, procyclical to per capita income receiving SSA countries; that the flows are procyclical to unemployment and inflation in sending OECD country; and that the major constraining factors on the stock of remittances in the SSA region are dual exchange rate practices and corruption. The paper recommends that experts quantifying the impact of the crisis on remittances should be mindful of these multiple channels. Most importantly, the paper notes that it is within the control of SSA governments to influence the flow of remittances, since the flows are mostly constrained by weak domestic economic institutions and inconsistent exchange rate policy.

1.0. Introduction

This paper aims at finding out whether international remittance flows to Africa are countercyclical to economic crisis in the OECD countries. Essentially, the attractiveness of international remittance to researchers and policymakers is based on the claim that it is the only source of external capital flow that is countercyclical to a socioeconomic crisis in the recipient country. That is, the flow increases when countries of origin are facing crisis (Gupta, 2005; Sayan, 2006; Chami et al., 2009; Jackman et al., 2009; Singer, 2010). This countercyclical theorem has come to form the central issue in most remittance-economic growth literature. Essentially, though, most of the existing evidence focuses on recipient countries. This is the case, despite, as pointed out by Frankel (2009), the importance of issues of cyclicality in international remittance flows to both migrants' host countries and their countries of origin. There is a lack of clear evidence on whether the countercyclical theorem still holds true in situations where remittance-sending countries face crisis.

An opportunity to test the countercyclical arguments has been created by the recent global economic and financial crisis that emanated from European and North American countries who are predominantly members of the Organisation for Economic Co-operation and Development (OECD). Conflicting evidence is already emerging as to the impact of the crisis on remittances. Among the popular claims is that the effect of the crisis would be repressive because of its likely effects on unemployment, loss of income and migration stock (Cali and Dell'Erbra, 2009; Nagarajan, 2009; and Panopio, 2009). Nagarajan (2009) particularly suggests two modes through which the crisis would affect remittance flows to the Sub-Saharan African (SSA) region – namely through reduction in the ability of migrants to send money home and reduction in migrant stock, due to job loss and subsequent return to their home countries. He also argues that the crisis would further exacerbate incidences of high transaction costs, thus leading to diversion in the flow of remittances from more transparent formal channels to traditionally non-transparent informal channels. This essentially means that remittance flows to developing economies might have maintained procyclical movements during the recent global economic and financial crisis.

On the other hand, strong criticism has sprung up against the popular opinion that the crisis would lead to a fall in remittances. The World Bank (2009), for instance, argues that the situation where crisis forces migrants to return home is tenable only if there are improved socioeconomic conditions in their home countries. Ratha and Mohapatra (2009) argue that migrant stock would be resilient to crisis and, as such, the trend is likely to maintain the increasing level of international remittance flows to developing countries. It has also been noted that due to the usual strong ties between migrants and their home families, remittances would still be resilient to the crisis (Panopio, 2009).

The importance of this debate to Africa is highlighted by Najarajan (2009). According to him, any impact of the crisis on remittance flows might exacerbate poverty and reduce the rate of economic growth in the region. It is therefore important to investigate how the recent economic and financial crisis in the remittance-sending OECD countries affected the flow of remittances in the SSA region. The focus on Sub-Sahara Africa is also significant, given that the region, as a conflict-prone area, has traditionally been used to advance the countercyclical theorem (see for example Gupta et al., 2009). Barajas et al. (2010) also notes that little is still known about the empirical behaviour of remittances flowing into the region.

2.0. The Countercyclical versus Procyclical Debate

Different theoretical perspectives have been used to explain the patterns of international remittance flows. In effect, whether the pattern is countercyclical, procyclical or acyclical is determined primarily by the motives of the remitters. As compensatory transfers, insurance, or family safety nets, remittance flows are said to be countercyclical (Gupta, et al., 2009; Singer, 2010; Chami et al., 2005). In this case, the stock of remittances increases as crisis intensifies in the home country of the migrant. Conversely, according to Giuliano and Ruiz-Arranz, (2009), remittances are procyclical if the flows are profit-driven and are motivated mostly by investment. This implies that migrants can only send more money home when home countries are socioeconomically stable and when there is the prospect of higher returns on investments. When remittances are made for implicit reasons, such as family aid and investments, it is said to be acyclical. In relationship to the economic atmosphere in the home countries of migrants, Giuliano and Ruiz-Arranz postulate that the flow is countercyclical when the relationship between remittances and output is significantly negative; procyclical when the relationship is significantly positive; and, acyclical when it is not satisfactorily significant.

Recent empirical evidence seems to provide support to the claim that international remittances flowing to most developing countries in the past have reacted countercyclically to crisis. The majority of studies in this area conclude likewise that remittance flows are important because of their resilience in times of economic crisis, social conflict and natural disasters (Gupta, 2005; Sayan, 2006; Gupta et al., 2009). Gupta et al. (2009) point out several studies that confirm that remittance flows indeed intensified in countries like Zimbabwe and Ghana in periods of socioeconomic crisis. They confirm this position further using the case of SSA, where they find that remittances have mitigating effects on poverty, promote financial development and ease the immediate budget constraints of recipient households. Similarly, Gupta (2005) investigates the impact of crisis-related factors in the case of India (e.g. years of drought years, agricultural growth rates and the Asian crisis). He provides evidence that remittances are higher when economic conditions abroad are benign as well as higher during periods of negative agriculture growth. Sayan (2006) makes use of the case of six low-income and six low-middle income countries to test whether the countercyclical nature of remittances is uniform across countries. He finds indeed that remittance receipts by nine out of the 12 countries in the sample moved countercyclically to the aggregate output for the whole group over the 1976-2003 period considered. Sayan warns, however, that

countercyclicality is hard to generalise to all countries, considering country-specific reasons possibly underlying such movements. Another interesting study by Esteves and Khoudour-Casteras (2009) uses historic data from European countries during the late nineteenth century wave of mass migration to test the resilience of remittance flows to. They confirm that remittances have a remarkable impact on the economy of emigration countries. Among other researchers whose research evidence supports the hypothesis is Yang (2008) uses a panel of 70 countries to conclude that remittances significantly increased during the hurricane periods in 1970 and 2002.

Evidence of the countercyclical theorem of international remittances is, however, inconclusive as other interesting studies have shown that remittance flows are procyclical in times of crisis. The theoretical stance of such studies is that by its weakening effects on institutional structures, crisis is likely to reduce the flow of remittances (Page and Plaza, 2006). Among the very recent and popular works are those of Lueth and Ruiz-Arranz (2008) and Cali and Dell'Erbra (2009). Using a gravity model that captured 1639 observations on bilateral remittances from 11 recipient and 16 sending countries, Lueth and Ruiz-Arranz (2008) find that contrary to general belief, remittance flows are rather procyclical – faltering when a home country's investment and political climate worsens and improving when otherwise. They conclude that remittances are less of a shock absorber as they do not limit vulnerability to shocks in the home countries of migrants. In an attempt to predict the likely impact of the recent global crisis on remittances, Cali and Dell'Erbra (2009) make use of a panel "outflow remittances" model involving 34 high-income countries and 25 upper- and middle-income countries (with data spanning from 1970 to 2007). Their key findings include that the effects of crisis on remittances captured by macroeconomic factors – such as gross domestic product (GDP) – is not as significant as the effects not captured in macroeconomic factors. They interpret this to mean that crisis might have more independent effects on remittance flows than theories have tried to suggest. Another major work that finds support for the procyclical hypothesis is Freund and Spatafora (2008), which establishes a positive coefficient on domestic income per capita as evidence for procyclicality.

Other researchers have promoted acyclical arguments for the flow of remittances. Adams (2009), for instance, case-studying 76 low-income and middle-income developing countries, finds that crisis-related factors like war and poverty in labour-sending countries are not

significant determinants of remittance flows. He argues that an inverted U-shaped curve exists between the level of per capita GDP income in a country and the receipt of remittances. Other researchers hold the view that whether or not remittances react countercyclically to crisis depends on other factors. For instance, Sharma (2009) conclude that the exact relationship between remittances and economic cycles is dependent upon micro issues such as the motivations behind the transfers and the circumstances of migrants' communities. Chami et al. (2009) find that the capacity of remittances to react countercyclically to economic instability is conditional on the quality of the institutional environment in the migrant's home country. Similarly, Sayan (2006) uses unconditional correlations between detrended remittances and detrended real GDP for 12 countries to reach his conclusion that remittances could in most cases be acyclical or even procyclical.

Recent studies on testing the countercyclical theorem mostly made use of host country data. Among such authors is Frankel (2009) who equally finds that remittances are procyclical to government spending and countercyclical to income in the migrants' countries of origin. He also argues that the countercyclical trend depends on whether a country is a net remittance sender or receiver. Only a handful of the remittances studies seem to have considered the macroeconomic conditions in the host countries of migrants in their estimation techniques. The fact that the few works are very recent (examples are Esteves and Khoudour-Casteras, 2009; Cali and Dell'Ebra, 2009; and Frankel, 2009), suggests that future remittance-growth studies will also focus on the socioeconomic conditions in host countries of migrants.

Essentially, past studies tend to concentrate on investigating the behavior of remittances when a migrant's country of origin is facing crisis. This left both the procylical and countercyclical hypotheses to be premised on the impression that economic and social crises are unique to labour-sending countries. Considering the conflicting nature of available evidence, there is still a need to test whether the hypotheses hold true when the host countries of migrant workers face crisis. The fact that OECD countries, which invariably host substantial numbers of African migrants, were at the centre of the recent crisis makes this research very necessary. The next section demonstrates the empirical methodology adopted in this paper to address the above concerns.

3.0. Data and Estimation Techniques

Data used in this study was collected from a total of 36 SSA countries and seven OECD countries for the period 2004 to 2008. The choice of time frame was to guard against drifting far from the period of the crisis, while at the same time capturing the peak moments of the crisis. The OECD countries included in the sample were Australia, Canada, Germany, Japan, Spain, the United Kingdom and the United States of America. The choice of these countries was based on the fact that they are included in 10 most popular destinations of African migrants (see also Barajas et al., 2010). They equally account for the major destinations of the 31 sampled SSA countries (see Appendix C)

Remittance inflows to the SSA countries form the observed variable in the analysis; it is proxied as the log of remittance inflow to the receiving SSA country. Also, considering that the focus of this paper is to estimate the effects of the global crisis on remittance flows, I adopt proxies that are likely to reflect the dimensions of the crisis in both the host and the home countries of migrants. To capture the economic environment of the host country during the crisis, for instance, I make use of proxies such as per capita GDP, unemployment rate and real exchange rate in the host OECD countries where each SSA country has a greater proportion of migrant stock. As for the remittance-receiving SSA countries, I include some of the stock of migrants, corruption, financial development and dual exchange rate. The likely impact of the crisis on remittance flows was controlled by including the per capita GDP of the SSA receiving country in the model. Predictions from previous studies on the effects of each of these variables on remittances are grouped into two – whether findings are in favour of the procyclical or countercyclical postulations. Studies that fail to reject the countercyclical hypothesis generally predict that remittances grow higher when unemployment is high, real GDP per capital is low and the local currency depreciates relative to other major currencies. However, opposite is the case for studies that have rejected the hypothesis.

Based on the above arguments and propositions of this paper, the benchmark econometric model used in the analysis is as follows:

$$Rem_{i,t} = \alpha_i + \beta_1 \log\chi_{i,t} + \beta_2 \log\eta_{i,t} + \beta_1 \log Crisis_i + \varepsilon_{i,t} \qquad (1)$$

Where Rem is a proxy for the stock of remittances in the SSA country *i*. *X* is a vector of other determinants of remittances in the migrant host OECD country where each SSA country has

greater proportion of migrant stock – including unemployment rate, real exchange rate and GDP per capita growth rate. Ŋ is a vector of the home countries' covariates (including migrant stock, GDP per capita, level of financial development, corruption and dual exchange rate). *Crisis* is a dummy variable used to capture years in which the global crisis was very noticeable (that is 2007 and 2008); α is the constant term representing unobservable country-level differences; ε_i represents the disturbance term. Similar to the approach adopted by Adams (2009), all the variables are transformed to their natural logarithm terms to be able to capture the elasticity of remittances with respect to each of the macroeconomic variables. The transformation is also aimed at allowing a comparison of the strength of the crisis-related macroeconomic variables in both home and host country of migrants.

No doubt, some of the independent variables in equation 1 are endogenous to remittance flows. Examples of such data are the stock of migrants in OECD countries and financial development. Adams (2009) has identified major variables that can serve as appropriate instruments for migrant stock abroad. These include the total population and the population density in the labour-sending country. He argues that these factors have the tendency to move in a positive direction with the stock of migrants abroad. For financial system development, among the commonly cited instruments are its lag value and property right (see for instance Freund and Spatafora, 2008; Herger et al., 2008; Alfaro et al., 2004; and La Porta et al., 1998). The definitions and sources of data for the above-named variables are contained in Appendix A of this paper.

4.0. Results

Descriptive statistics of the research variables are reported in Appendix B. Table 1 below compares pooled ordinary least square (OLS) estimates with fixed effects panel estimates. Column 1 reports results of the regression equation with stock of remittances as the dependent variable. The OLS results indicate that per capita income in remittance-receiving countries has a positive and very significant effect on stock of remittances; in addition, per capita income in remittance-sending OECD countries negatively affects the stock of remittances in a fairly significant manner. This leaves an initial impression that remittance flows might be countercyclical to the economic situation in sending countries and procyclical in receiving countries. Consistent with the findings of Giuliano & Ruiz-Arranz (2009) this position may hold true as long as a good percentage of remitted funds are used for investment purposes. However, it contradicts previous claims that remittances to SSA countries and

some other developing countries are used mostly for consumption purposes and for altruistic reasons (Gupta et al., 2009). While the fixed effects regression tends to support the positive effect of per capita income in sending countries (though in a non-significant manner), it does not show support for the negative effect in sending OECD countries. Instead, it turned positive and significant at five percent. Macroeconomic factors in remittance-sending OECD countries (such as the real exchange rate and unemployment) have consistent negative and significant effects on the stock of remittances. The two results in support the procyclical hypothesis. In other words, as unemployment rates heighten and exchange rates depreciate in the OECD sending countries, the stock of remittances in SSA countries decreases. Interestingly, corruption in SSA receiving countries has negative and highly significant effects on stock of remittances – meaning that as the incidences of corruption increase, migrants might be unwilling to remit more money home. The OLS estimation equally shows reasonable support for previous findings and the *a priori* expectation that both stock of migrants and financial development have positive effects on stock of remittances. Lastly, the Hausman test indicates that the pooled OLS estimation is more efficient than the fixed-effects panel estimation (with chi-square value = 23.45 and probability = 0.005). This can be attributed to the fact that the sample timeframe (2004 to 2008) is short, and that most of the SSA countries in the sample share similar economic characteristics.

Table 1: OLS regression on the effects of macroeconomic factors on stock of remittances in SSA countries

	1	2	3	4
	Dependent variable = log of workers' remittances			
Per capita GDP in remittance-receiving SSA country	0.238***	0.145	0.236***	0.252***
	(3.79)	(0.83)	(3.68)	(3.85)
Per capita GDP in remittance-sending OECD country	-0.046**	3.351**	-0.045	0.005
	(-1.98)	(2.18)	(-1.54)	(0.06)
Real exchange rate in OECD remittance-sending country	-2.797*	-2.267***	-5.205	-1.909
	(-1.71)	(-3.19)	(-0.73)	(-0.93)
Inflation in OECD remittance-sending country	-0.026	0.017	-0.06	-0.021
	(-0.29)	(0.35)	(-0.45)	(-0.14)
Unemployment rate in OECD remittance-sending country	-0.615***	-0.299*	-0.600**	-0.274
	(-3.54)	(-1.63)	(-2.62)	(-0.71)
Dual exchange rate in SSA remittance-receiving Country	-0.061	Omitted [a]	-0.067	-0.060
	(-0.42)		(-0.45)	(-0.40)
Corruption in SSA receiving Country	-0.970***	-0.447**	-1.000***	-0.894***
	(-3.41)	(-2.29)	(-3.39)	(-2.98)
Crisis in OECD remittance-sending Country	0.035	0.015	-13.140	0.043
	(0.34)	(0.26)	(-0.38)	(0.40)
Stock of migrants in OECD Remittance-sending Countries	0.436***	-0.337	0.438***	0.471***
	(4.21)	(-1.07)	(4.17)	(4.19)

Financial development in SSA remittance-receiving country	0.429*** (2.92)	0.057 (0.34)	0.433** (2.89)	0.392** (2.57)
Inflation*Crisis in OECD remittance-sending country			0.069 (0.38)	
Unemployment*Crisis in OECD remittance-sending country			-0.108 (-0.28)	
Per capita GDP*Crisis in OECD remittance-sending country			-0.001 (-0.03)	
Real exchange rate*Crisis in OECD remittance-sending country			2.894 (0.39)	
Francedummy				-0.346 (-0.76)
USAdummy				-0.100 (-0.21)
Constant	19.096** (2.49)	-10.379 (-0.87)	30.197 (0.92)	13.861 (1.39)
No. Of Countries	31	31	31	31
No. Of Observations	140	140	140	139
R-square	0.418	0.376	0.419	0.412
F-statistics	9.26	6.70	6.45	7.35
Prob>F-statistic	0.000	0.000	0.000	0.000
Hausman chi-square	23.45			
Prob>Hausman chi-square	0.005			

Notes: with the exception of the dual exchange dummy, all other variables in the regression are expressed in natural logs. Absolute values of robust *t-statistics* are in parenthesis. ***, **, * indicate significance at 1 percent, 5 percent, and 10 percent levels, respectively. [a] omitted due to collinearity problem. Column 1 = pooled OLS estimates, column 2 = fixed effects panel estimates; column 3 = interative OLS estimates; and, column 4 = OLS with OECD dummy variables.

There is the possibility that the effects of per capita income and the other macroeconomic factors in the remittance-sending countries are independent of the recent global economic crisis. That is, the above stated results persist over time, irrespective of whether or not there is crisis. To test for this hypothesis, the macroeconomic factors are interacted with the crisis variable. The results are reported in Table 1, column 2. It is shown that none of the interacted variables produced significant evidence. This implies that, similar to the finding of Cali and Dell'Erbra (2009), the macroeconomic factors have a specific and independent (from the crisis) effect on remittance stock in SSA countries.

It is important also to test how the variation in the impact of the crisis across the OECD countries affected stock of remittances in SSA countries. To do this, dummy variables are included – one standing for USA and the other for France. Essentially, the two countries have the highest number of SSA countries with majority of migrants. Of the sampled SSA countries 42 percent have USA or France as their major destination. The two dummy variables produce negative but non-significant effects. Of course, the negative coefficients imply that indeed the economic conditions in each of the two countries might have led to a

decline in the stock of remittances in the affected SSA countries. The only variable that loses its significance with the introduction of USA and France dummies is unemployment in OECD countries. This indicates the important role unemployment may play in an attempt to explain the reaction of remittance flows to the global economic crisis.

I apply an instrumental variable regression approach to be able to account for the influence of endogeneity in the OLS estimates reported above. Evidence from previous empirical reports show that two of the control variables in my model are usually endogenous: stock of migrants and financial development. According to Bound et al. (1995), endogeneity of explanatory variables causes OLS to produce biased and inconsistent estimates of the causal effect of an explanatory variable on an outcome. Resolving such a problem requires finding appropriate and strong instruments for both variables. Following Adms (2009), I apply the total population and population density in remittance-receiving SSA countries as instrumental variables for stock of SSA migrants in OECD countries. A priori, a significant and positive relationship is expected between each of the two variables and stock of remittances. Also following the examples of previous researchers like Beck et al. (2000), Levine et al. (2000), and Alfaro et al. (2004), we introduce property right in the SSA remittance-receiving country as one of the instrumental variables for financial development. I also include for the latter, a one-year lagged value of financial development. Advanced by Freund and Spatafora (2008), this is to resolve the likely causal relationship between remittance flows and financial development, and also to control the endogeneity issues associated with using financial development as one of the determinants of stock of remittances.

Table 2 reports the results of the first stage of the instrumental variable (IV) regression. The two instrumental variables for stock of SSA migrants in OCED countries (population and population density) tend to significantly increase stock of migrants. This finding confirms results of previous studies like Adms (2009). The lag value of financial development produces significant results. Although the effect of property right is positive, it does not seem to be significant in this case. For both sets of instruments, the F-values of the excluded instruments 17.53 and 27.66 for stock of migrants and financial development are well above the normal threshold of 10; see Wright (2002) for specific information on first-stage *F statistic*. This implies that all the instruments used prove to be very relevant.

Table 2: First stage IV estimates for both stock of SSA country migrants in OECD and level of financial development in remittance-receiving SSA countries

	Migrant stock	Financial development
Instrumental variables		
Population in receiving SSA country	0.220***	
	(6.36)	
Population density in receiving SSA country	0.061*	
	(1.79)	
1 year lag of financial development in receiving		0.526***
SSA country		(9.42)
Property right in receiving SSA country		0.019
		(0.28)
Included exogenous variables		
Per capita GDP in remittance-receiving	0.024	0.065**
SSA country	(0.47)	(2.18)
Per capita GDP in remittance-sending	0.027	-0.222**
OECD country	(1.57)	(-2.17)
Real exchange rate in OECD remittance-sending	-0.098	-0.979
country	(-0.08)	(-1.36)
Inflation in OECD remittance-sending	0.199***	0.030
country	(2.96)	(0.77)
Unemployment rate in OECD remittance-	0.347**	0.003
sending country	(2.49)	(0.04)
Dual exchange rate in SSA remittance-receiving	0.604***	0.051
country	(6.11)	(0.89)
Corruption in SSA remittance-receiving	0.043	0.419***
country	(0.19)	(3.22)
Crisis in OECD remittance-sending	-0.022**	0.056
country	(-2.28)	(1.22)
Constant	-0.936	5.063
	(-0.16)	(1.50)
No. Of Observations	139	139
R-square	0.626	0.725
F-statistics	17.53	27.66
Prob>F-statistic	0.000	0.000

Notes: with the exception of the dual exchange dummy, all other variables in the regression are expressed in natural logs. Absolute values of robust *t-statistics* are in parenthesis. ***, **, * indicate significance at 1 percent, 5 percent and 10 percent levels, respectively.

Table 3 below reports results of the IV regression. Column 1 reports two-stage least square (2SLS) results, column 2 reports generalised moment of movements (GMM) results, and column 3 reports limited information maximum likelihood (LIML) reports. The three models are adopted to arrive at robust and improved IV estimates. The GMM is said to produce efficient estimates in the presence of heteroskedasticity, but is more appropriate when the sample size is large (Hansen, 1982). On the other hand, both 2SLS and LIML models produce efficient and unbiased estimates with relatively small samples. By implication, therefore, the 2SLS and the LIML models are more reliable in the context of this paper than the GMM model. For the 2SLS model, the Durbin chi-square test and the Wu-Hausmann F-

test fail to reject the null hypothesis that stock of migrants and financial development variables are endogenous in my model at 5 percent level of significance, with both p = 0. For the GMM, the C-statistic confirms that the instruments are indeed endogenous at 5 percent significant levels (p = 0). The Hausman (1978) test reaffirms my position that the IV regression model is more efficient than the OLS model at 5 percent significant level, with Hausman chi-square = 19.42 and p = 0.

I further test whether the instruments are uncorrelated with the structured error term, one of the requirements for efficient IV estimates. The Sargan chi-square and the Basmann chi-square tests of overidentification restrictions for the 2SLS (at p = 0.327 and 0.357, respectively); the Hansen J statistic for GMM (at p = 0.300); as well as the Andersen-Rubin chi-square and Basmann F test for the LIML (at p = 0.326 and 0.329) all fail to reject the null hypothesis that the instruments are valid at 5 percent level of significance. The post-estimation results suggest that the IV model is very efficient and robust for estimating the effects of macroeconomic factors in both remittance-sending and remittance-receiving countries on the stock of international remittances.

For emphasis, the essence of the first stage regression is to help produce instrumented values of migrant stock and financial development. The first stage results of the three IV models (that is the 2SLS, the GMM and the LIML) are the same. Starting with the two instrumented variables, the stock of SSA country migrants in OECD countries has a positive and very significant effect on the stock of remittances, with an elasticity value greater than one. This confirms the general principle that migration accounts for the bulk of the overall stock of remittance flows to developing countries (see for instance Singer, 2010; Gupta et al., 2009; Adams, 2009). The results have two major implications for the SSA context. First, it shows that the majority of officially recorded remittances in the region may actually originate from the OECD countries. In other words, the majority of unrecorded remittances may arise from intra-regional migrations. Secondly, as indicated by Freund and Spatafora (2008), the stock of migrants from SSA in OECD countries can serve as a sufficient proxy for the overall stock of migrants from the region. Although, in this case, the financial development variable is not significant, its positive sign provides support for the result of previous studies that remittance flows are higher in countries with developed financial systems (Freund and Spatafora, 2008).

Are remittances countercylclical to development in OECD countries? Contrary to the position of most countercyclical literature, the results here show that remittance flows tend to be

countercyclical to per capita income in remittance-sending OECD countries and procyclical to remittance-receiving SSA countries. My results reveal that while per capita income in remittance-receiving SSA countries impacts positively and significantly on the stock of remittance, the per capita income in OECD sending countries impacts negatively and significantly too. This could possibly be linked to the conclusion of Giuliano and Ruiz-Arranz (2009) that remittances are predominantly profit-driven. On the other hand, unemployment in sending OECD countries tends to have negative and significant effects on stock of remittances. This implies that an increased unemployment level in OECD countries has the tendency of reducing the stock of officially recorded remittances in SSA countries. In effect, a percentage increase in the unemployment rate is likely to reduce remittance stock from OECD countries by as much as 0.6 percentage point.

The result here has important implications in interpreting the behaviour of remittance flows in the present economic reality. Firstly, it casts doubt on earlier results that remittance flows might be countercyclical to the economic crisis in OECD countries. Secondly, it reveals that the flow of remittances to SSA countries might have been significantly affected by the current global economic crisis, mostly through its incremental effects on unemployment rates. It confirms that the main channel through which the crisis would affect remittance flows to the SSA region is indeed reduction in employment income occasioned by job cuts, layoffs and income reduction, and not necessarily through the returning of migrants to their home countries. In fact, the positive and highly significant effect of migration stock suggests that the proportion of remittances lost through reduction in the income status of migrants could be regained through increased migrant stock. Such a proposition is in line with the position of the World Bank (2009) and Ratha and Mohapatra (2009) that migrant stock would be resilient to the global crisis. Among other macroeconomic factors in OECD remittance-sending countries, inflation is found to have declining impact on the stock of remittances in the SSA region (while the effect of real exchange rate is not very significant). The result of the crisis variable does not produce any significant evidence.

The results presented in Table 3 below indicate that two of the major factors responsible for any depressive effects on stock of remittances to the SSA countries are the prevalence of dual exchange rate practice and corruption. Both determinants produce very significant and negative impacts on stock of remittances. Consistent with the results of Freund and Spatafora (2008) and Gupta et al. (2009), the existence of black markets in the SSA region clearly allows for the flow of a high proportion of remittances through informal channels, since

migrants know that they can easily exchange foreign currencies without necessarily having to pass through the documentary processes associated with banks and money transfer organisations (MTOs).

Table 3: IV estimates of the effects of macroeconomic factors on stock of remittances

	2SLS	GMM	LIML
Dependent variable = log of stock of workers' remittances			
Per capita GDP in remittance-receiving SSA country	0.291***	0.291***	0.294***
	(4.01)	(4.56)	(3.98)
Per capita GDP in remittance-sending OECD country	-0.077**	-0.071**	-0.078**
	(-2.78)	(-2.58)	(-2.79)
Real exchange rate in OECD remittance-sending country	-2.973*	-2.398	-2.982
	(-1.62)	(-1.20)	(-1.61)
Inflation in OECD remittance-sending country	-0.220**	-0.167	-0.231**
	(-1.94)	(-0.99)	(-1.99)
Unemployment rate in OECD remittance-sending country	-0.690***	-0.645***	-0.693***
	(-3.52)	(-3.30)	(-3.49)
Dual exchange rate in SSA remittance-receiving country	-0.594**	-0.580***	-0.623**
	(-2.80)	(-3.44)	(-2.87)
Corruption in SSA remittance-receiving country	-0.972**	-0.919***	-0.969**
	(-2.87)	(-2.96)	(-2.81)
Crisis in OECD remittance-sending country	0.093	0.078	0.096
	(0.80)	(0.68)	(0.82)
Stock of migrants in OECD countries	1.135***	1.146***	1.175***
	(5.31)	(5.35)	(5.31)
Financial development in SSA remittance-receiving country	0.158	0.117	0.141
	(0.67)	(0.51)	(0.59)
Constant	19.033**	16.235*	19.029**
	(2.222)	(1.77)	(2.19)
No. of Observations	139	139	139
R-square	0.218	0.210	0.195
Minimum Eigenvalue statistic	13.173 (11.04) [#]		
Endogeneity Test			
Durbin chi-square	20.506 (0.000)		
Wu-Hausman F statistic	10.903 (0.000)		
GMM C statitstic		18.338 (0.000)	
Test for overidentification restrictions			
Sargan chi-square	2.238 (0.327)		
Basmann chi-square	2.061 (0.357)		
Hansen *J* statistic		2.406 (0.300)	
Andersen-Rubin chi-square			2.241 (0.326)
Basmann F statistic			1.329 (0.329)

Notes: with the exception of the dual exchange dummy, all other variables in the regression are expressed in natural logs. Absolute values of robust *t-statistics* are in parenthesis. ***, **, * indicate significance at 1 percent, 5 percent, and 10 percent levels, respectively. [#] The critical value of the Eigenvalue is in parenthesis.

5.0. Conclusion

The growing relevance of debates on the impact of the recent economic crisis on remittance flows is based on the important role remittances play in the development of the recipient countries' economies. Recent research efforts, from 2009, have focused on identifying the channels through which the crisis has affected the flow of remittances to developing countries, as well as on forecasting the proportion of decline caused as a result of the crisis. To help verify some of the estimates made so far, this paper strives to answer the question of whether remittance flows to SSA countries are countercyclical to crisis in OECD sending countries. The results produced here are mixed, as there is no uniform pattern on how macroeconomic indicators that reflect the crisis periods could impact remittances. Contrary to the position of most countercyclical literature, the paper shows that remittance flows tend to be countercyclical to per capital income in remittance-sending OECD countries and procyclical to per capita income in remittance-receiving SSA countries. On the other hand, remittance flows to SSA countries are procyclical to unemployment and inflation in sending OECD countries. As expected, the major depressive factors on the stock of remittances in the SSA region are dual exchange rate practice and corruption.

The above findings have some interesting policy implications. Firstly, experts quantifying the impact of the crisis on remittances should be mindful of the multiple channels through which the crisis could affect remittance flows. Basing estimates on the impact of a single macroeconomic factor (like per capita income) might produce biased results. Secondly, it is important to note that it is within the control of SSA governments to influence the flow of remittances, given the fact that the flow is significantly stifled by corruptions and weaknesses in foreign exchange systems. Corruption erodes the confidence of African migrants to send money home, especially in the case where remittances are for investment or savings purposes. Corruption also has very significant negative effects on the capacity of domestic institutions, such as the financial system, to track remittances. It is therefore necessary that efforts to fighting corruption and rebuild confidence in domestic economic institutions are intensified at the local level. As for the persistence of dual exchange rate practices, necessary legal frameworks need to be developed. Finally, the fact that the global crisis exacerbated incidences of unemployment in OECD migrant host countries presents an ample opportunity for African governments to attract African professionals in the diaspora back home. They can do this by addressing those fundamental issues (such as infrastructure, security and governance) that prevent their professionals overseas from returning home.

Appendix A: Data sources

Variables	Remarks	Source
Per capita GDP in remittance-receiving SSA country	Log value	United Nations Statistics Division - National Accounts
Per capita GDP in remittance-sending OECD country	Log value	Division of International Labour Comparison, U.S. Department of Labour, 2009
Real exchange rate in OECD remittance sending country	Log value	World Development Indicators (by World Bank)
Inflation in OECD remittance-sending country	Log value	World Development Indicators (by World Bank)
Unemployment rate in OECD remittance-sending country	Log value	Division of International Labour Comparison, U.S. Department of Labour, 2009
Dual exchange rate in SSA receiving Country	Dummy variable = 1 if country has dual exchange rate, and 0 if otherwise	Annual report on exchange/arrangements and restrictions (by IMF)
Corruption in SSA receiving Country	Values range 10 for country free from corruption, and 0 for most corrupted (Log value)	Transparency International Corruption Perception Index for the relevant years
Crisis in OECD remittance-sending Country	Dummy variable = 1 for the years economic crisis manifested (2007 and 2008), and 0 for the years prior to crisis	Author's estimates
Log of stock of SSA migrants in OECD Countries	Aggregated SSA country migrants in OECD	OECD International Migration Statistics
Financial development in SSA receiving country	Ratio of broad money supply to GDP (Log value)	World Development Indicators (by World Bank)
Log of stock of remittances in SSA receiving countries	Official workers' remittances as reported in country's balance of payment account	World Development Indicators (by World Bank)

Appendix B: Summary statistics of the main regression variables

	Observations	Mean	Standard Deviation	Min.	Max.
Per capita GDP in remittance-receiving SSA country	155	1,449.57	1965.53	115.00	9,888
Per capita GDP in remittance-sending OECD country	155	26,808.82	16,664.25	94.2	43,250
Real exchange rate in OECD remittance sending country	155	100.27	3.35	92.5	110.5
Inflation in OECD remittance-sending country	155	2.39	1.01	0.00	4.40
Unemployment rate in OECD remittance-sending country	155	6.97	2.17	3.90	11.30
Dual exchange rate in SSA receiving country	155	0.68	0.47	0.00	1.00
Corruption in SSA receiving country	145	3.01	0.95	1.60	6.10
Crisis in OECD remittance-sending country	155	0.40	0.49	0.00	1.00
Log of stock of migrants in OECD countries	155	3.27	0.71	1.50	4.40
Financial development in SSA receiving country	155	30.88	18.37	12.30	102.8
Log of stock of remittances in SSA receiving countries	155	7.96	0.74	6.00	10.00

Appendix C: Major destinations of Sub-Sahara African Migrants in the OECD

SSA Country	OECD Country	Share of Migrants in OECD Countries (%)
Benin	France	50.6
Botswana	Japan	30.6
Burkina Faso	France	36.1
Cameroon	France	40.5
Cape Verde	USA	52.4
Congo (Dem. Republic)	France	50.9
Côte d'Ivoire	France	63.9
Ethiopia	USA	64.2
Gabon	France	63.4
The Gambia	Spain	54.8
Ghana	USA	44.5
Guinea-Bissau	Spain	41.1
Kenya	USA	56.3
Lesotho	Japan	24.6
Madagascar	France	84.6
Malawi	Japan	33.1
Mali	France	53.7
Mauritius	France	41.3
Mozambique	Germany	29.9
Namibia	Germany	28.4
Niger	Germany	42.8
Nigeria	USA	46.3
Rwanda	Canada	27.5
Senegal	Spain	34.7
Sierra Leone	Australia	56.3
South Africa	Australia	37.6
Swaziland	USA	22.0
Tanzania	USA	34.8
Togo	USA	35.7
Uganda	USA	46.3
Zambia	USA	42.9

Sources: Computed from OECD International Migration Statistics

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