
**MAXIMISING THE IMPACT OF REMITTANCES ON DEVELOPMENT
OUTCOMES. THE CASE OF SADC**

Dr Emmanuel Owusu-Sekyere, Prof Renee vanEyden, Dr Francis Kemegue

ABSTRACT

This paper investigates how remittances from South Africa to 10 countries in the Southern African Development Cooperation (SADC) region could be directed through formal channels to impact on development outcomes. Using annual data from 1994 to 2008, two-step system GMM by Arellano and Bover (1995) and seemingly unrelated regressions by Zellner (1962), we find that when spatial and individual effects are controlled for, different factors drive remittances to the SADC countries in the panel. While altruism prevails in some, self interest prevails in others. This implies that the optimal policy pathway aimed at mitigating the use of informal channels or maximising the impact of remittances on development outcomes would differ between countries. Overall, the level of financial deepening in the home country is also crucial to the use of formal channels and the ability of countries to harness remittances for development purposes.

Keywords: Migration, remittances, Sub-Saharan Africa, Southern Africa Development Community.

JEL Classification: C33, F22, F24, O55

INTRODUCTION

Remittance inflows into sub-Saharan Africa are not only from developed countries. It is estimated that over 20 percent of sub-Saharan African migrants are within the region and also remit regularly (Barajas et al. 2010). It needs to be mentioned though that migration patterns within sub-Saharan Africa are equally driven by political factors as by economic factors. The SADC¹ Region has had its share of political conflict from the prolonged rebel wars in Angola and Mozambique, pre-apartheid South Africa and political instability in Zimbabwe. These conflicts had spillover effects within the region as people were forced to relocate to neighbouring countries, sometimes settling permanently. Currently, most countries in the SADC region are politically stable making migration for economic reasons more prevalent than for political reasons.

2 This excludes South Africa the migrants' host country in this study.

3 Home country is the migrant's country of origin and the host country is his country of sojourn.

As in many other developing countries economic reasons driving migration in the SADC region include high levels of unemployment and poverty, lack of access to finance for rural, poor and low income households, inconsistent sources of income, lack of basic amenities like shelter, health services, water and sanitation, poor infrastructure and a generally low quality of life (United Nations Human Development Report, 2009). Rural headcount poverty as a percentage of rural population averaged 60% while urban headcount poverty as a percentage of urban population averaged 36% for the countries in this study, from 1994 to 2008. Approximately 50% of the total population in the SADC region live below \$1.00 a day² (World Development Indicators, 2008). These factors drive migrants across borders in search of better working and living conditions (Ravenstein, 1885). Migrants consist of skilled and unskilled labour that work, consume, save and invest in both host and home countries³ as well as send money home to support the basic needs of their families.

Consequently, remittances, a financial outcome of migration, have over the last three decades emerged as a key link between human mobility and development. Remittances serve as a vital means of subsistence by which the unemployed, poor and low income households are able to smooth consumption and income (Ratha, 2003). In countries with under developed financial systems and strong constraints to financial access, remittances have been found to smooth access to finance for the poor and financially excluded (Gupta et al. 2007). Remittances have contributed to employment creation by providing capital for microenterprises (Woodruff and Zenteno, 2001). Due to the multiplier effect of remittance inflows, non-recipient households have also benefited indirectly through labour income and payment for goods and services by recipient households. In Mexico \$1.00

U.S dollar of remittances was found to generate \$4.00 additional dollars in demand for goods and services (Durand et al., 1986). Remittances have also been harnessed by some countries in Asia and Latin America to improve on development outcomes. Asian countries like Bangladesh and The Philippines⁴ and Latin American countries like Ecuador and Mexico⁵ have been able to harness remittances from their citizens in the diaspora to finance community development projects such as schools, electricity, hospitals, sanitation facilities and portable water (Martinez, 2005) offering participating migrants very attractive returns on investment and tax incentives.

4 LINKAPIL: Link for Philippine Development-involves mobilisation of Diaspora and migrant resources for development incorporating tax incentives and privileged investment options for the Diaspora. The LINKAPIL channels both financial and non-financial donations to development related projects in 75 cities and 17 provinces of the country, thus covering approximately 14 million beneficiaries (Asian Development Bank, 2007).

5 “My family, My Country, My Return” scheme in Ecuador, Mi Casa Housing Scheme in Mexico, Program 3 x 1 in Mexico; remittances sent for community projects are quadrupled and given tax incentives (Orrozco, 2004).

However, unlike countries in Latin America and Asia, countries in the SADC region are yet to maximise the synergies between human mobility and development through remittances. The positive impact of remittances on development outcomes has not been adequately explored by countries in the SADC region. This is largely attributable to several factors such as inadequate awareness of the drivers and constraints to these inflows through formal channels, overregulation, underdeveloped financial systems and markets, lack of the requisite structures and enabling environment (Ketley, 2006). An additional policy challenge for many developing countries including the SADC region is the use of informal channels and its implications for money laundering, terrorism financing, illegal foreign exchange markets and fraud (Pearce, 2006).

The objective of this paper therefore is to investigate how remittances from South Africa to the ten SADC countries in the panel could be directed through formal channels and thereon to more productive uses. First of all, are remittances from South Africa to the SADC countries in the panel driven by self interest or altruism? This distinction is critical since the policy and market positioning required to mitigate the use of informal channels or maximise the impact of remittance inflows on development outcomes would differ in each case. Second, which other factors are critical to the optimal policy or market positioning required to achieve these objectives? Third to address the lack of specificity in sample wide estimations, this paper augments the sample wide estimations with country specific analysis to facilitate country specific policy interventions. Furthermore this paper investigates whether the high degree of economic integration between South Africa and the SADC countries, or their close physical proximity has any impact on remittance patterns and consequently the policy interventions required. Finally the empirical relevance of cross sectional dependence of the error term is ascertained and controlled for in this study, thereby addressing one major critique of panel data estimations. Cross-sectional dependence of the error term implies that the error term is contemporaneously correlated across cross-sections. Within the context of remittances cross sectional dependence is caused by the spillover effect of remittances across borders in the SADC region. Labour mobility (both skilled and unskilled) and cross border trade are highly prevalent within the region. This means that non-recipient households also benefit from remittance inflows through labour income and demand for goods and services by recipient households (Durand et al., 1986). These factors create spillover effects which have not been accounted for in the remittances literature on Sub-Saharan Africa. In the presence of cross-sectional dependence of the error terms, methods that assume cross-sectional independence could result in estimators that are inefficient with biased standard errors, which may lead to misleading inference (Baltagi, 2008).

The rest of this paper is organised as follows; section 2 reviews related literature, section 3 data and methodology, section 4 empirical results and section 5 concludes with recommendations for policy and future research.

1. Related literature

The literature identifies a number of reasons why migrants send money home. Migrants remit their families to help meet their basic needs and wants - referred to as altruism (Chami et al. 2005), or as a socio-cultural duty that further enhances their standing for inheritance purposes, referred to as “enlightened self interest” by Lucas and Stark (1985). In a study of remittances and migration patterns in western Kenya, Hoddinott (1994) found that remittances were part of a long term implicit contract between parents and their sons. The migrant’s compliance to this contract was rewarded with inheritance or bequests by his parents. Remittances are also sent to reimburse migrants’ families for the cost of migration and education abroad or as a co-insurance mechanism in times of crisis (Solimano, 2003). This co-insurance mechanism is based on the assumption that crisis times in the host and home countries are inversely related (Addison, 2004).

Migrants send money home to finance business ventures, acquire or maintain physical assets such as land or housing. These returns seeking remittances are said to be for self-interest purposes (Docquier et al. 2006). In such instances migrants prefer a depreciating home country exchange rate since it maximises the value of their remittances in local currency units which can then afford a larger bundle of goods and services (Acosta et al. 2007). In close relation to this, and also for self interest purposes, the rate of return on financial investments in the migrant’s home and host country has also been found to influence the migrant’s portfolio choices. In this case the migrant allocates his portfolio between investment opportunities at home and in his host country. This is further dependent on the interest rate differential between the home and host country, economic stability, political stability and confidence issues (Chami et al. 2005). Under such circumstances remittance inflows act as another type of capital inflow. The migrant is better placed to invest in his home country from his higher income and savings - (financial capital) and his knowledge of new business models obtained in the host country - (cultural capital) (Gallina, 2006). In the short run Katseli and Glystos (1986) found that an increase in the host country interest rates results in a decline in remittances sent home as the migrant takes advantage of investment opportunities in the host country. However in the medium to long term as his wealth position improves due to returns on investments, remittances sent home by the migrant increases. On the contrary, Katseli and Glystos (1986) found no relationship between home country interest rates and remittance inflows to developing countries. In this case migrants would be reluctant to take advantage of an increase in home country interest rates except it is accompanied by a stable or an appreciating real

exchange rate. Thus exchange rate uncertainties are seen as a measure of risk since returns on investments are assumed to be in home country currency units (Higgins et al. 2004).

The duration of migration are also known to influence remittance motives. Temporary migrants seeking to raise capital for specific short term purposes have been found to be more inclined towards self interest motives while permanent migrants are more geared towards altruistic motives (Glystos, 1997; Pinger, 2007). Although there is no data on temporary or permanent migration trends in SADC, the close proximity of the SADC countries to South Africa could lead to a higher degree of temporary migration to South Africa as opposed to permanent migration. In line with the literature, it is expected that self-interest motives which is known to be associated with temporary migration would dominate altruistic motives for remittances in the SADC region.

Besides Sub-Saharan Africa in general, very limited literature exists on intra African remittance flows, what drives or constrain them and their impact on development outcomes. This is because most previous work relating to foreign inflows have mainly focused on foreign direct investment, official development assistance and portfolio investments which are mostly external to the African continent. This paper therefore fills the gap in the intra-African remittances literature which is virtually non-existent in the remittances literature on Sub-Saharan Africa.

South Africa is used as a representative host country because the largest proportion of remittances within sub-Saharan Africa is from South Africa. As at end 2006, 33 percent of remittance inflows within sub-Saharan Africa were from South Africa, 18 percent from Cote D'Ivoire, 11 percent from Uganda, 7 percent from Angola, 4 percent from Botswana and 27 percent from other sources in the region (Migration Policy Institute, 2006). Second it is the strongest economy in the region and the main migration destination for SADC migrants. Consequently South Africa's economy drives economic trends in the region through existing regional protocols and economic treaties aimed at achieving monetary integration, a customs union and a common market among other policy objectives. This creates a high degree of inter-dependencies between SADC countries and South Africa.

Table 1: Cross-correlation analysis of real GDP per capita of the SADC countries and South Africa.

	ZAR	BOT	LES	MDG	ML	MUS	MOZ	SEY	SWZ	TAN	ZAM
ZAR	1										
BOT	0.84**	1									
LES	0.99**	0.88**	1								
MDG	0.50**	0.3	0.51**	1							
MLW	0.27	0.03	0.29	0.57*	1						
MUS	0.89**	0.99**	0.93**	0.38	0.15	1					
MOZ	0.93**	0.97**	0.95**	0.39	0.12	0.98**	1				
SEY	0.70**	0.77**	0.75**	0.53*	0.43	0.81**	0.79**	1			
SWZ	0.89**	0.98**	0.93**	0.35	0.04	0.99**	0.97**	0.74**	1		
TAN	0.98**	0.93**	0.98**	0.42	0.14	0.96**	0.93**	0.72**	0.96**	1	
ZAM	0.97**	0.73**	0.94**	0.52*	0.2	0.78**	0.85**	0.57**	0.80**	0.92**	1

Cross-correlation analysis of the real GDP per capita of South Africa and the countries in the panel are detailed in Table 1. The first column shows strong positive correlations between the real GDP per capita of South Africa and that of the countries in the panel significant at 1% level except for Malawi. This serves as a good indication of the regional impact of the South African economy in the Southern African region.

Additionally, the financial sectors of the countries in the region are relatively under-developed with strong capital controls. This inhibits the use of formal channels for remittances. Furthermore, all the countries in the panel are in close proximity to South Africa, indicating the possibility of a high incidence of temporary migration within the region. These characteristics of the SADC region makes it well suited to the factors affecting remittances as stipulated in the literature and a perfect case study for intra-African flows.

3.Data and methodology

Table 2 details the variables used for this study and how they are defined. The data used in this paper was acquired from the World Development Indicators of the World Bank, International Monetary Fund and the South African Reserve Bank. Remittances is taken as the dependent variable and measured as workers' remittances as a percentage of GDP, both expressed in nominal terms and measured in millions of US dollars. Variation in remittances is determined by the home country income level, measured by real GDP per capita of the respective SADC countries in the panel, in US dollars, the host country income level, measured by real GDP per

capita in South Africa, the interest rate differential between home and host country, financial deepening in the home country, suitably proxied by money and quasi money as a percentage of GDP (M2/GDP), and the real exchange rate (Bougha-Hagbe, 2004; Funkhouser, 1995; Lucas and Stark, 1985). Financial deepening (M2/GDP) equals currency, demand deposits and interest bearing liabilities of the financial sector divided by GDP. It is considered the broadest measure of financial intermediation (Ruiz-Arranz and Giuliano, 2005).

Table 2: Sources and definition of variables

	Variable	Source	Definition
<i>rem</i>	Remittances as a percentage of GDP	World Bank	Worker's remittances as a percentage of GDP in current prices (US\$ Millions).
<i>gdpc</i>	Home country income level in SADC country	World Bank	Annual real GDP per capita in 2000 constant prices (US dollars).
<i>sagdpc</i>	Host country income level (South Africa)	World Bank	Annual GDP per capita of South Africa in 2000 constant prices.
<i>m2</i>	Financial deepening in home country	World Bank	Money and quasi money as a percentage of GDP in home country.
<i>idif</i>	Interest rate differential	IMF, World Bank	Differential between the deposit interest rate in SADC countries and in South Africa.
<i>rer</i>	Real exchange rate	IMF, World Bank	Nominal bilateral exchange rate of the SADC countries' domestic currency to the rand, multiplied by the ratio of the CPI of South Africa (2000 = 100) to the aggregate price level (GDP deflator 2000 = 100) for the SADC countries.

Descriptive statistics of the variables used in this paper are detailed in Table 3. For the 10 countries in the panel remittances as a percentage of GDP averaged 6.2% from 1994 to 2008. There are however wide disparities. Remittances to Lesotho averaged 27% of GDP, Malawi and Mauritius follow with an average of 5% while remittances to the rest of the countries range between 1 and 4% of GDP over the period. M2 as a ratio to GDP averaged 34%, which indicates a deeper financial sector in the SADC region as compared to Sub-Saharan Africa as a whole (25.3%). Real GDP per capita for South Africa averaged almost twice as much as the rest of the SADC countries put together. This explains why most migrants in the sub-region migrate to South Africa in search for better work and living conditions.

Table 3: Descriptive statistics of variables

Variable	Mean	Min	Max	Obs.
<i>rem</i>	6.22	0.09	46.11	150
<i>gdp</i>	1 772.88	123.56	8 208.23	150
<i>sagdp</i>	3 195.05	2933.72	3 795.95	150
<i>m2</i>	34.32	11.89	117.36	150
<i>idif</i>	-1.34	-14.29	25.59	150
<i>rer</i>	249.39	-656.58	11554	150

As a ratio to other foreign inflows and key aggregates in the SADC region as at end 2008, remittances were approximately 46% of Official Development Assistance (ODA) and 47% of Foreign Direct Investment (FDI) to the region. As at end 2008, remittance inflows to SADC were 11% and 8% of regional exports and imports of goods and services as a percentage of GDP respectively and exceeded the regional current account surplus by 36%.

Cross-correlation analysis in Table 4 shows strong persistence behaviour between remittances from South Africa to the 10 countries in the panel. Home country income is negatively related to remittances indicating the existence of some degree of altruistic motives in remittances sent home by migrants from the SADC countries in the panel. Host country income is negatively related to remittances, meaning SADC migrants in South Africa do not remit more money home when their incomes improve in the host country. Financial deepening (*m2*) is positively related to remittances inflows. This depicts the relevance of financial deepening to formal remittance inflows (Gupta et al. 2007, Singh et al. 2010).

The interest rate differential is negatively related to remittance inflows and statistically insignificant. This seems to align with the findings of Katseli and Glystos (1986) that a higher home country interest rate has no relationship with remittance inflows to developing countries.

Remittances are also negatively correlated with the real exchange rate but not statistically significant. Since correlation does not mean causality there is the need to ascertain these trends with an empirical estimation of the data

Table 4: Cross-correlations of variables (contemporaneous)

Variables	<i>rem</i>	<i>rem(-1)</i>	<i>idif</i>	<i>m2</i>	<i>gdpc</i>	<i>sagdpc</i>	<i>rer</i>
<i>rem</i>	1						
<i>rem(-1)</i>	0.98***	1					
<i>idif</i>	-0.09	-0.10	1				
<i>m2</i>	0.01	-0.01	-0.10	1			
<i>gdpc</i>	-0.20**	-0.20**	-0.15**	0.83***	1		
<i>sagdpc</i>	-0.08	-0.08	0.10	0.09	0.08	1	
<i>rer</i>	-0.10	-0.10	-0.10	-0.10	-0.14*	-0.08	1

Note: (*), (**), (***) denotes 10%, 5% and 1% level of significance respectively.

We specify a dynamic model which includes one or more lags of the dependent variable due to the strong persistence behavior of the dependent variable as depicted by the cross-correlation analysis. Initial diagnostic tests reveal that cross-sectional specific effects are valid but time effects are not valid. Consequently the error term takes a one-way error component form and the model is specified as

$$y_t = \delta y_{t-1} + \beta + vt \tag{1}$$

where $t = NT \times 1$ vector of dependent and endogenous variables. t represents an $NT \times k$ vector of lagged endogenous regressors other than the lag of the dependent variable, β denotes a $k \times m$ vector

of slope coefficients, represent country-specific effects and t the idiosyncratic error term. Results of Breusch and Pagan (1980) Lagrange Multiplier Test for cross-sectional dependence of the error term show that the errors of the cross-sections are contemporaneously correlated. The Breusch and Pagan (1980) LM Test is used when $T > N$ with a H_0 : cross-sections are independent. To establish the order of integration of the dataset we use the Pesaran (2003) cross-

sectionally adjusted Dickey Fuller (CADF) test due to the heterogeneity among the countries in the panel and the existence of cross-sectional dependence of the error term. It assumes a H0: non-stationarity of the data series. Beside remittances and interest rate differential which are stationary, the rest of the variables are I(1). See Table 5 for the order of integration of the variables and Table 6 for initial diagnostic tests performed on pooled OLS and fixed effects models. Equation (1) as specified above is based on the assumption of exogeneity of the regressors. The Hausman test for endogeneity rejects the null of exogeneity since the lag of the dependent variable $rem(-1)$ is correlated with the fixed effect error

term, a case of Nickel Bias (Nickell, 1981). Per-variable endogeneity tests show that all the other regressors besides the lag of the dependent variable are exogenous. The Lagrange Multiplier test for heteroscedasticity shows that the variance of the error terms is not constant with the potential consequence of bias in the standard errors. A number of empirical approaches address these characteristics of the dataset; individual effects, endogeneity, heteroscedasticity and cross-sectional dependence of the error term.

Table 5: Pesaran (2003) Cross-sectional Augmented Dickey Fuller CADF Unit root Test

	<i>rem</i>	<i>gdpc</i>	<i>sagdpc</i>	<i>idif</i>	<i>m2</i>	<i>rer</i>
Pesaran (2003) t-stat						
Levels	-2.46**	-1.14	2.61	-1.16**	-1.93	-1.50
[P-value]	[0.01]	[0.95]	[1.00]	[0.03]	[0.26]	[0.73]
Differences	--	-2.50**	-2.73***	--	-2.47**	-2.39**
[P-value]		[0.01]	[0.00]		[0.01]	[0.02]

Note: ***/**/* denotes 1/5/10 per cent level of significance. Statistical insignificance implies failing to reject the null of non-stationarity, p-values in []. Critical values at 1/5/10 percent available in Pesaran (2003) and in test results output in STATA 11.

The Least Square Dummy Variable (LSDV) estimation technique with the Kiviet (1995) bias correction is first used to estimate the model. This eliminates the cross-sectional specific effects and also addresses the small sample bias associated with LSDV dynamic panel estimations (Nickell, 1981). The two-step system GMM estimation technique of Arellano and Bover (1995) with forward orthogonal deviations and Wind meijer (2005) corrected standard errors is also employed for robustness. Cross-sectional specific effects are eliminated using forward orthogonal deviations instead of the usual first differencing approach. This is because the first differencing approach is known to generate weak instruments due to their inability to effectively eliminate serial correlation.

Using forward orthogonal deviations instead of first differencing makes it possible to use one-period lags of the regressors as valid instruments since they are not correlated with the transformed error term (Love and Zichinno, 2006; Amuedo-Dorantes and Pozo, 2007; Coulibaly, 2009). Additionally, the forward orthogonal deviations approach preserves homoscedasticity, prevents serial correlation and also preserves the orthogonality between transformed variables and lagged regressors (Arellano and Bover, 1995).

Table 6: Initial diagnostic tests

Test	Test Statistic	Critical Value	Inference
Joint validity of cross-sectional effects $H_0: \mu_1 = \mu_2 \dots \mu_{N-1} = 0$ $H_A: \text{Not all equal to } 0$	F = 3.38	$F_{(0.05, 10, 135)} = 1.90$	Cross-sections are heterogeneous.
Joint validity of time (period) fixed effects $H_0: \alpha_1 = \dots \alpha_{T-1} = 0$ $H_A: \text{Not all equal to } 0$	F = 1.23	$F_{(0.05, 13, 132)} = 1.79$	Time-specific effects are not valid. Error term takes a one way error component form.
Heteroscedasticity $H_0: \sigma^2 = \sigma^2$ $H_A: \text{Not equal for all } i$	LM = 47.83	$\chi^2_{(10)} = 18.31$	There is heteroscedasticity present.
Hausman specification test $H_0: E(\alpha_{it} / \epsilon_{it}) = 0$ $H_A: E(\alpha_{it} / \epsilon_{it}) \neq 0$	$m_3 = 15.72$	$\chi^2_{(6)} = 12.59$	There is endogeneity between the regressors and the fixed effects error term.
Breusch-Pagan LM Test for Cross sectional dependence $H_0: \text{corr}(\epsilon_{it}, \epsilon_{jt}) = 0 \text{ for } i \neq j$ $H_A: \text{corr}(\epsilon_{it}, \epsilon_{jt}) \neq 0 \text{ for some } i \neq j$	LM = 78.43	Prob = 0.0015	Cross-sections are inter-dependent

It is also more resilient to missing data since it is computable for all observations except the last for each cross-section, hence minimising data loss (Roodman, 2006). The LSDV and two-step system GMM estimation approaches however assume cross-sectional independence of the error

term. To address the cross-sectional dependence of the error term we employ the seemingly unrelated regressions (SUR) approach by Zellner (1962).

To maintain the dynamic framework of the panel estimation and avoid serial correlation we instrument for the one-period lag of the dependent variable with a two-period lag of the dependent variable. The SUR is best suited for estimations with cross-sectional dependence since it captures the efficiency due to the contemporaneous correlation of the error terms across cross-sections especially when $T > N$ (Baltagi, 2005). It also allows for detailed country-specific analysis in comparison to full sample estimation results. The initial diagnostics are carried out in EViews7 and the estimation is done in STATA 11.

4. Empirical results

The empirical results are detailed in Tables 7 (sample wide results) and 8 (country specific results) below. All variables are used in natural log-form, except for the interest rate differential, idif.

From the two-step system GMM results in Table 7 (which are quite similar to the results of the LSDV estimation with Kiviet (1995) correction) the coefficient of lagged remittances is positive and significant at 1 percent. This confirms the persistent behavior of remittance inflows from South Africa to the SADC countries in the panel as depicted by the cross-correlation analysis. The coefficient of home country income is negative and statistically significant at 1 percent. This indicates altruistic patterns in remittances sent home by SADC migrants in South Africa. The coefficient of the migrant's income in the host country is negative and statistically significant at 1 percent. This is consistent with the cross correlation analysis and earlier findings by Coulibaly (2009). Thus, although migrants from SADC countries in South Africa support their families back home, remittances sent home do not increase with an increase in the migrant's income in South Africa. The coefficient of interest rate differential is positive and significant at 1 percent depicting the potential of SADC migrants to take advantage of investment opportunities back home. This contradicts the cross-correlation analysis and modifies earlier findings by Katseli and Glystos (1986), who found no relationship between remittances and a positive interest rate differential (higher home country interest rate). As expected the coefficient of financial deepening is positive and statistically significant at the 1 percent.

Table 7: Empirical results.

Dependent variable rem6

Methodology/Variables	<i>rem(-1)</i>	<i>gdp</i>	<i>sagdp</i>	<i>idif</i>	<i>m2</i>	<i>rer</i>
LSDV with Kiviet (1995) correction	0.95*** [0.11]	-0.36*** [0.37]	-0.11*** [0.03]	0.05** [0.02]	0.03** [0.01]	0.10*** [0.02]
Two-step system GMM, Arellano and Bover (1995)	0.86*** [0.04]	-0.55*** [0.11]	-0.20*** [0.11]	0.04*** [0.01]	0.04*** [0.01]	0.001 [0.004]
ARBond 2 nd order serial correlation	Prob > z = 0.48					
Sargan test for validity of overidentification restrictions H_0 : model is well specified	Prob > χ^2 = 0.49					
Difference in Hansen Statistic for exogeneity of the instrument set. H_0 : exogeneity of instrument set	Prob > χ^2 = 0.58					

Note: (*), (**), (***) denotes 10%, 5% and 1% levels of significance respectively. Standard errors in parentheses

This aligns with earlier findings by Gupta et al. (2007) and Singh et al. (2010) that well developed financial systems are crucial to the use of formal channels or the ability of countries to harness remittance inflows for more productive uses. The real exchange rate is statistically insignificant.

The result of the SUR estimation in Table 8 addresses the problem of cross sectional dependence and also enables country-specific analysis. This is very relevant as regional studies of this nature are often criticized as lacking country specificity.

Beside the sample wide results country level differences exist. It can be observed from Table 8 that for Botswana, Mozambique, Seychelles, Swaziland and Tanzania the coefficient of home country income is negative and statistically significant. The coefficient of the migrant's income in the host country is also positive and statistically significant. This indicates altruistic patterns in remittances of migrants from these five countries in South Africa. Their migrants in South Africa also remit more

6 All variables are used in natural log-form, except for the interest rate differential, *idif*.

money home when their incomes improve in South Africa. The coefficients of home country income and the migrant's income in the host country are statistically insignificant for Lesotho, Madagascar and Malawi.

This implies that remittances of migrants from Lesotho, Madagascar and Malawi are not driven by economic conditions back home nor increases in their incomes in South Africa. For Zambia and Mauritius, the coefficient of home country economic conditions is positive and statistically significant, while the coefficient of the migrant's income in the host country is negative and statistically significant. This indicates that migrants from Zambia and Mauritius in South Africa respond to good economic conditions back home and do not remit more money home when their incomes improve in South Africa.

The coefficient of financial deepening is positive and statistically significant for Botswana, Lesotho, Madagascar, Malawi, Mozambique and Tanzania, six out of the ten countries in the panel. This underlines the key role of financial deepening to directing remittance inflows through formal channels and thereon for more productive uses (Gupta et al. 2007, Singh et al. 2010). M2 is however negatively signed and statistically significant for Mauritius, Seychelles, Swaziland and Zambia. This is consistent with the literature that sometimes remittances mitigate access to finance constraints for the poor and financially excluded in countries with under developed financial systems (Gupta et al. 2007).

The coefficient of interest rate differential is positive and statistically significant for Lesotho, Malawi and Mozambique, but negative and statistically significant for Madagascar, Mauritius and Swaziland. It is however insignificant for Botswana, Seychelles, Tanzania and Zambia. This indicates that migrants from Lesotho, Malawi and Mozambique would take advantage of financial investment opportunities back home, while remittances of migrants from Botswana, Seychelles, Tanzania, Zambia, Madagascar, Mauritius and Mozambique are not driven by financial investment opportunities back home. Migrants from Botswana, Lesotho, Malawi and Tanzania prefer a stable exchange rate however the exchange rate is statistically insignificant for the rest of the countries in the panel.

Table 8: Seemingly unrelated regressions (Dependent variable rem)

	BOTS	LES	MDG	MLW	MUS	MOZ	SEY	SW	TAN	ZAM
<i>rem(-2)</i>	-0.64* [0.35]	0.58*** [0.11]	0.15 [0.18]	-0.27*** [0.05]	-0.89*** [0.15]	0.75*** [0.23]	-0.77 [0.51]	0.47*** [0.10]	-0.17* [0.09]	-0.16 [0.30]
<i>gdp</i>	-0.63*** [0.18]	-0.35 [0.26]	-0.37 [0.55]	0.15 [1.98]	0.57*** [0.18]	-0.23** [0.10]	-0.74* [0.40]	-0.91*** [0.27]	-0.16*** [0.04]	0.68*** [0.21]
<i>sagdp</i>	0.65*** [0.18]	0.24 [0.19]	0.15 [0.41]	0.66 [1.16]	-0.40** [0.18]	0.13** [0.06]	0.95** [0.46]	0.88*** [0.26]	0.12*** [0.03]	0.46*** [0.15]
<i>idif</i>	0.04 [0.03]	0.15*** [0.03]	-0.01*** [0.004]	0.06*** [0.01]	-0.17*** [0.03]	0.05* [0.03]	-0.06 [0.18]	0.28** [0.11]	-0.02 [0.04]	0.02 [0.08]
<i>m2</i>	0.05*** [0.02]	0.13*** [0.03]	0.05*** [0.02]	0.23*** [0.08]	-0.09*** [0.01]	0.09* [0.04]	-0.06* [0.03]	-0.19*** [0.07]	0.17*** [0.05]	-0.10*** [0.03]
<i>rer</i>	-0.86** [0.33]	-0.21*** [0.08]	0.0001 [0.0001]	-0.21*** [0.04]	0.06 [0.04]	0.0003 [0.0003]	-0.02 [0.02]	-0.42 [0.16]	-0.02*** [0.003]	0.002 [0.003]
Breusch-Pagan test of independence: $\chi^2_{(45)} = 50.77$ Prob = 0.26										
Correlation matrix of residuals (Remittances)										
Botswana	1									
Lesotho	-0.55	1								
Madagascar	0.02	-0.01	1							
Malawi	-0.18	0.32	-0.14	1						
Mauritius	-0.33	0.01	-0.52	-0.37	1					
Mozambique	-0.10	0.32	-0.09	0.40	-0.04	1				
Seychelles	0.25	-0.39	0.08	-0.15	-0.27	0.18	1			
Swaziland	0.29	-0.28	0.09	0.17	-0.38	-0.11	0.01	1		
Tanzania	0.13	0.27	0.34	0.34	-0.88	0.05	0.32	0.18	1	

Zambia		-0.30	0.23	0.13	0.01	0.10	0.34	0.52	-0.40	0.06	1	
--------	--	-------	------	------	------	------	------	------	-------	------	---	--

Note: (*), (**), (***) denotes 10%, 5% and 1% levels of significance respectively. Standard errors in []

5. Conclusion, policy implications and future research

The empirical results show that when cross-sectional dependence of the error term and individual effects are controlled for different factors drive remittances from South Africa to the 10 SADC countries in the panel. While altruism prevails in some, self interest motives prevail in others. Migrants from Lesotho and Malawi exhibit self interest remittance patterns. This is evidenced by the positive and statistically significant coefficients of interest rate differential and financial deepening, coupled with the negative and statistically significant coefficient of the real exchange rate variable for Lesotho and Malawi. This indicates that migrants from Lesotho and Malawi are keen on the quality of financial services and would take advantage of financial investment opportunities back home, under a stable or strong exchange rate. This aligns with Higgins et al. (2004) who found that exchange rate uncertainty as a measure of risk is significant to self-interest/returns seeking remittance inflows to home countries.

On the contrary, migrants from Botswana, Mozambique, Seychelles, Swaziland and Tanzania exhibit altruistic remittance patterns. This is evidenced by the negative and statistically significant coefficient of home country income. They also remit more money home when their incomes improve in South Africa as evidenced by the positive and statistically significant coefficient of the migrant's income in the host country. Consequently, the institutional and market positioning required to mitigate the use of informal channels or harness remittances as an alternative source of finance for development would differ between countries. Where self interest prevails policy makers would have to focus on ensuring a stable exchange rate while financial service providers would have to design products and services with attractive return on investment. On the contrary, where altruism prevails, financial service providers would have to focus on designing products and services that smooth household income and consumption for migrants' families. This would help to enhance the use of formal channels for remittances and the ability of countries to harness these inflows as an alternative source of finance for development. It would also promote financial inclusion for poor and low income households who constitute the majority of remittance receiving households.

The level of financial deepening is key to the ability of countries to harness remittances through formal channels and thereon for more productive uses. This corroborates earlier findings by Gupta et al. (2007) and Singh et al. (2010). As in many other developing countries, the financial sectors in the 10 SADC countries in the panel are characterised by constraints to financial services for poor and low income households due to eligibility issues, high fees and charges,

products and services that are unsuitable to the needs and wants of poor and low income households. Thus to mitigate the use of informal channels or maximise the impact of remittances on development outcomes financial services providers would have to address the high remittances fees and charges, eligibility issues, and design products and services that are more compatible to the needs and wants of migrants and their families. The associated financial sector regulations should also be more facilitative than inhibitive of market development.

The issue of close proximity to the host country leading to a high incidence of temporary migration and therefore a prevalence of self interest remittance patterns over altruism yielded mixed results. Consistent with the literature migrants from countries closer to South Africa such as Lesotho and Malawi who are probably more prone to temporary migration to South Africa exhibit self interest motives, while migrants from countries farther away like Seychelles who are likely to be more inclined towards permanent migration to South Africa exhibit altruistic motives for remittances. However there are exceptions. Although Botswana is very close to South Africa and Swaziland lies within South Africa's territory they both exhibit altruistic remittance motives. These country specific findings address the lack of specificity associated with sample wide estimations and give deeper insight into which policy pathway would be optimal for each country. The optimal policy pathway would differ between countries although the policy objective is the same.

Finally, we find that it is empirically relevant to test for and control for cross sectional dependence of the error term in panel estimations involving SADC countries. The use of the requisite estimation techniques that controls for these characteristics of the dataset as used in this paper yields results that modify earlier findings and facilitate country specific policy interventions.

In terms of future research it would be useful to look at other sub-regions within Sub-Saharan Africa such as Francophone West Africa, Anglophone West Africa or the CEMAC region in relation to their dominant migration destinations and the main source of remittances to these regions in Sub-Saharan Africa. This would further address the lack of literature on intra African remittance inflows and also enhance effective corridor-specific policy initiatives.

List of References

- Acosta, A.P., Lartey, E.K.K. and Mandelman, S.F. 2007. Remittances and the Dutch disease. Federal Reserve Bank of Atlanta Working Paper 2007-08.
- Amuedo-Dorantes, C. and Pozo, S. (2004). Workers' remittances and the real exchange rate: A paradox of gifts. *Journal of World Development* 32(8):1407-1417.

- Arellano, M. and Bover, O. (1995). Another look at the instrumental variable estimation of error component model. *Journal of Econometrics* 68:29-52.
- Baltagi, B.H. (2008). *Econometric Analysis of Panel Data*. 4th (ed). United Kingdom. John Wiley and Sons Ltd.
- Barajas, A., Chami, R., Fullenkamp, C. and Garg, A. (2010). The global financial crisis and workers' remittances to Africa: What's the damage? IMF Working Paper WP/10/24. Washington. International Monetary Fund.
- Breusch, T.S. and Pagan, A.R. (1980). The Lagrange multiplier tests and its applications to model specification in econometrics. *Review of Economic Studies* XLVII 239-253.
- Chami, R., Fullenkamp, C. and Jahjah, S. (2003). Are immigrant remittance flows a source of capital for development? IMF Working Paper 03/189. Washington: International Monetary Fund.
- Coulibaly, D. (2009). *Macrodeterminants of migrant remittances: New evidence from a panel VAR*. Paris: Centre d'Economie de la Sorbonne.
- Docquier, F. and Rapoport, H. (2006). The economies of migrants' remittances. Discussion Paper 1351, Institute for the Study of Labor (IZA), Bonn, Germany.
- Durrand, J., Parrado, A., & Massey, D. (1996). Migradollars and Development: A Reconsideration of the Mexican Case. *International Migration Review*, 30(2), 423-444.
- Elbadawi, I.A. and Rocha, R. (1992). Determinants of expatriate workers' remittances in North Africa and Europe. Working Papers 1038:1-56. Washington D.C. The World Bank.
- Elsakka, M.I.T. and McNabb, R. (1999). The macroeconomic determinants of emigrant remittances. *Journal of World Development* 27(8):1493-1502.
- FinMark Trust. 2010. *FinScope Malawi Report*. [Online] Available: <http://www.finmarktrust.org.za> [Accessed April 2012].
- Fisher, R.A. (1932). *Statistical methods for research workers*. Edinburgh. Oliver and Boyd 4th Edition.
- Gallina, A. (2006). The impact of international migration on the economic development of countries in the Mediterranean basin. United Nations Expert Group Meeting on International

Migration and Development in the Arab Region. UN/POP/EGM/2006/04. New York. United Nations.

Glystos, N. (1997). Remitting behaviour of temporary and permanent migrants: the case of Greeks in Germany and Australia. *Labour* 11:409 - 435.

Gupta, S., Patillo, C. and Wagh, S. (2007). Impact of remittances on poverty and financial development in Sub-Saharan Africa. IMF Working Paper 07/38. Washington: International Monetary Fund.

Hansen, L. P. (1982). Large sample properties of generalised method of moments estimators. *Econometrica* 50:1029-1054.

Herzberg, V. (2006) Access to Finance in the Mediterranean Partner Countries-Can Remittances Deliver? Proceedings of the 2nd International Conference on Migration and Remittances, London: United Kingdom.

Higgins, M., Hysenbegasi, A., Pozo, S. (2004). Exchange Rate uncertainty and workers' remittances. *Applied Financial Economics* 14:403-411.

Hoddinott, J. (1994). A model of migration and remittances applied to Western Kenya. *Oxford Economic Papers* 46(3):459-476.

Holtz-Eakin, D., Newey, W. and Rosen, H.S. (1988). Estimating vector-autoregressions in panel data. *Econometrica* 56(6):1371-1395.

United Nations Human Development Report (2009). New York. United Nations

Im, K., Pesaran, H. and Shin, V. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics* 115:53-74.

Katseli, L. and Glystos, N. (1986). Theoretical and empirical determinants of international labour mobility: A Greek-German perspective. Centre for Economic Policy Research Working Paper 148.

Ketley, R. (2006) Evolving Opportunities and Constraints in Remittances. A view from SADC. Proceedings of the 2nd International Conference on Migration and Remittances, London: United Kingdom.

Kiviet, J. F. (1995). On bias, inconsistency and efficiency of various estimators in dynamic panel data models. *Journal of Econometrics* 68:53-78.

- Love, I., and Zicchino, L. (2006). Financial development and dynamic investment behaviour: Evidence from panel VAR. *The Quarterly Review of Economics and Finance* 46:190-210.
- Lucas, R and Stark, O. (1985). Motivations to remit: Evidence from Botswana. *The Journal of Political Economy* 93:901-918.
- Maddala, G.S. and Wu, S. (1999). A comparative study of unit root test with panel data. *Oxford Bulletin of Economics and Statistics* 61:631-652.
- Martinez, J.L. (2005). Workers' Remittances to Developing Countries: A Survey with Central Banks on Selected Public Policy Issues. *World Bank Working Paper 3638*. Washington. World Bank.
- Migration Policy Institute. (2006). Remittance profile, Sub-Saharan Africa. www.migrationpolicy.org/datahub Accessed 15 February 2010.
- Nickell, S. (1981). Biases in dynamic models with fixed effects. *Econometrica* 49(6): 1417-1426.
- Orrozco, M. (2004). Remittances to Latin American and the Caribbean: Issues and Perspectives on Development. Organisation of American States. Washington D.C.
- Pearce, D (2006) Key Developments in Remittance Inflows since 2003. Proceedings of the 2nd International Conference on Migration and Remittances, London: United Kingdom
- Philips, P. and Sul, D. (2003). Dynamic panel estimation and homogeneity testing under cross section dependence. *Economics Journal* 6:217-259.
- Ratha D. (2003). Worker's Remittances: An Important and Stable Source of External Development Finance. *Global Development Finance* 157-175.
- Ravenstein, E.G. (1985). The Laws of Migration. *Journal of the Royal Statistical Society* 162-177.
- Roodman, D. (2006). How to do xtabond2: An introduction to "difference" and "system" GMM in Stata. Working Paper 103. Center for Global Development. Washington.
- Roodman, D. (2008). A note on the theme of too many instruments. Working Paper 125. Center for Global Development. Washington.
- Singer, A. (2008). Migrant remittances and exchange rate regimes in the developing world. Massachusetts Institute of Technology. Cambridge. Massachusetts. USA.

Singh, R.J., Haacker, M. and Lee, K. (2009). Determinants and macroeconomic impact of remittances in Sub-Saharan Africa. International Monetary Fund Working Paper 09/216. Washington D.C. International Monetary Fund.

Windmeijer, F. 2005. A finite sample correction for the variance of linear efficient two-step GMM estimators. *Journal of Econometrics* 126: 25-51.

Woodruff, C. and Zenteno, R. (2001). Remittances and microenterprises in Mexico. UCSD Graduate School of International Relations and Pacific Studies Working Paper. San Diego. University of California.

World Bank. (2008). World Development Indicators. World Bank.

Zellner, A. (1962). An efficient method of estimating seemingly unrelated regressions and tests for aggregation bias. *Journal of the American Statistical Association* 57:348-368.