April 2011

Abstract

This paper investigates what drives or constrains remittances from South Africa to 10 countries in the Southern African Development Cooperation (SADC) region. 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 cross-sectional dependence of the error term and individual effects are controlled for, both altruism and self interest motives jointly drive remittances to the SADC countries in the panel. The quality of financial services is crucial to the use of formal channels and the ability of countries to harness remittances for development purposes. However country-specific differences exist meaning 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.

1.   Introduction

Remittance inflows into sub-Saharan Africa are not only from developed countries. It is estimated that about 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 SADC[1] 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.

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[1] Botswana, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Seychelles, Swaziland, Tanzania, Zambia, South Africa.

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% whiles 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 $2.00 a day[2] (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 countries[3] 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 Philippines[4] and Latin American countries like Ecuador and Mexico[5] have been able to harness

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[2] This excludes South Africa the migrant's host country in this study.

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

[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).

remittances from their citizens in the diaspora to finance community development projects such as schools, electricity provision, hospitals, sanitation facilities and portable water (Martinez, 2005) offering participating migrants very attractive returns on investment and tax incentives.

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 have 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 which factors drive or constrain remittance inflows through formal channels within the SADC region. 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. Secondly, which other factors are critical to the optimal policy or market positioning required to achieve these objectives? Thirdly 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. In the presence of cross-sectional dependence of the error terms, methods that assume cross-

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[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).

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.

2. 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 negatively correlated. Conversely for the migrant, having improved living conditions back home to return to if necessary is reassuring as "bad times" could also occur in the host country (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 this regard temporary migrants seeking to raise capital for specific short term purposes have been known to be more inclined towards self interest motives whiles 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.

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. 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. This is because exchange rate fluctuations 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 degree of economic integration between countries has also been found to influence remittance patterns. When countries' economies are highly integrated, they sometimes replicate each other's business cycle trends. An improvement in one country's economy translates to some extent into an improvement in the other country's economy. Migrants have generally been known to remit more money home when their incomes increase as a result of an improvement in the economic conditions of the host country (Elbadawi and Rocha, 1992; El-Sakka and McNabb, 1999). However with a high degree of integration between the migrant's host and home countries the improvement in the migrant's income might not necessarily translate into increased remittances sent home by the migrant for altruistic reasons since economic conditions of the migrant's family back home might also have improved to some extent (Coulibaly, 2009). As posited by this literature, the high degree

of economic integration between the SADC countries and South Africa implies that an improvement in South Africa's economic conditions would either have no effect or be negatively related to remittances sent home for altruistic reasons by SADC migrants in South Africa.

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.

The SADC region is used in this study for a number of reasons. First, it fills the gap in the intra-African remittances literature which is virtually non-existent. Second, 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).

Third, the SADC region has an economic treaty aimed at achieving regional integration. Inherent in the SADC Treaty is the Finance and Investment Protocol which sets the legal basis for regional cooperation and harmonisation in the areas of finance, investment and macroeconomic policy. It entails a well structured macroeconomic policy framework that has targets for achieving monetary integration, a customs union and a common market among other policy objectives. This creates a high degree of interdependencies between the countries and an indication of strong spatial dynamics in the region.

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. Although correlation does not mean causation it is a good indication of the direction of relationship between these economies and their degree of integration.

INSERT TABLE 1

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.

INSERT TABLE 2

3.1   Descriptive statistics and stylised facts

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[6]. M2 as a ratio to GDP averaged 34%, which indicates a more developed deposit mobilising ability of the financial sector in this 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

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[6] See Figure 1

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.

INSERT TABLE 3

The interest rate differential between the countries in the panel and the host country South Africa averaged -1.34 across the period indicating a higher interest rate in South Africa and probably higher returns on investment as compared to the countries in the panel. Figure 1 depicts remittances as a ratio to GDP in the 10 SADC countries in the panel.

INSERT FIGURE 1

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 (see Figure 2). 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%. This shows the potential of remittance inflows as a supplement to financing the external gap in recipient countries and regions.

INSERT FIGURE 2

3.2 A priori expectations

The sign and inference of the independent variables in relation to remittances are detailed in Table 4.

INSERT TABLE 4

3.3   Cross-correlation analysis

Table 5 details cross-correlations between remittances and other variables in the model. There is a high positive correlation between remittances in the current period and remittances in the previous period, statistically significant at the 1% level. This strong persistence behaviour of the dependent variable indicates the need for a dynamic model specification for the empirical estimation in this paper. Remittances also have a low negative correlation with home country economic conditions and statistically significant at the 5% level. This indicates the existence of some degree of altruistic motives in remittances sent home by migrants from the SADC countries in the panel.

INSERT TABLE 5

As expected the quality of financial service delivery (M2) is positively correlated with remittance inflows. This depicts the relevance of the quality of financial services to formal remittance inflows (Singh et al. 2010). However the correlation coefficient of M2 with remittances is not statistically significant. M2 is highly positively correlated with real GDP per capita in the SADC countries and statistically significant at the 1% level. This indicates the positive effect of a well-developed financial services industry on the real income per capita of countries due to its impact on access to finance. Host-country economic conditions are negatively correlated with remittance inflows. This is consistent with the literature that when the degree of economic integration between two countries is high, an increase in the migrant's income due to an improvement in the host country's economic conditions might not necessarily translate into increased remittances sent home, especially for altruistic reasons. This is because the economic conditions back home might have improved as well (Coulibaly, 2009).

The interest rate differential is negatively correlated with 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. This has different implications for different reasons why migrants remit home. A real exchange rate depreciation which denotes adverse economic conditions in the home country would have a positive relationship with altruistic remittance inflows[7] and self interest inflows aimed at acquiring physical assets but a negative relationship with self-interest inflows aimed at financial investments. On the contrary, a real exchange rate appreciation which denotes strong economic fundamentals would have a positive relationship with self-interest remittance inflows aimed at financial investments since return on investment are assumed to be in home country currency units (Higgins et al. 2004)

Since correlation does not mean causation there is the need to ascertain these trends with an empirical estimation of the data.

3.4 Model specification and estimation technique

The model takes a dynamic form 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 in the previous section. 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

$$y_{it} = \delta y_{it-j} + X'_{it} \beta + \ \mu_i + \ v_{it} \tag{1}$$

where $Y_{it} = NT \ x1$ vector of dependent and endogenous variables. X'_{it} represents an $NT \ x \ k$ vector of lagged endogenous regressors other than the lag of the dependent variable, β denotes a $k \ x \ m$

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[7] The migrant might remit the same amount of money as before but the depreciating exchange rate would result in his family back home receiving in higher amount in local currency units. This is synonymous to an increase in remittance inflows although the actual amount remitted by the migrant has not changed.

vector of slope coefficients, μ_i represent country-specific effects and ν_{it} the idiosyncratic error term. Results of Breusch and Pagan (1980) Lagrange Multiplier Test for cross-sectional dependence of the error term show that the cross-sections in the panel are inter-dependent, meaning 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 test for the order of integration of these variables we use the Im, Pesaran and Shin Test (2003), ADF-Fisher Chi-square Test and PP- Fisher Chi-square (1932) since these unit root tests assume individual unit root processes and accommodate cross-sectional dependence to some extent (Maddala et al. 1999; Baltagi, 2008). Beside remittances, interest rate differential and terms of trade which are stationary, the rest of the variables are $I(1)$. See Table 6 for the order of integration of the variables.

INSERT TABLE 6

See Table 7 for initial diagnostic tests performed on pooled OLS and fixed effects models.

INSERT TABLE 7

The model as specified in equation (1) above raises additional issues. First of all, it is based on the assumption of strict exogeneity of the regressors E ($\nu_{it} \mid x_{i1}....,x_{in}$, μ_i) = 0. The Hausmann test for endogeneity rejects the null of exogeneity, meaning the regressors and the fixed effect error terms are correlated. Secondly, the Lagrange Multiplier test for first order serial correlation given fixed effects rejects the null of no first order serial correlation. Meaning the lag of the dependent variable $y_{i,t-1}$ is correlated with the fixed effects (μ_i) or idiosyncratic error term. This violates classical OLS assumptions required for unbiased and consistent estimators (Nickell, 1981).

The results of initial diagnostics as detailed above warrant the use of an estimation technique that preserves homoscedasticity, prevents serial correlation, controls for cross-sectional dependence of the error term and also preserves the orthogonality between transformed variables and lagged regressors (Arellano and Bover, 1995).

Empirical literature posits a number of approaches. A few of these estimation techniques are employed in this paper to allow for cross comparison of findings and also for robustness. First the

Least Square Dummy Variable (LSDV) estimation technique with the Kiviet (1995) bias correction[8] of up to order $O(1/T)$ and bootstrapped standard errors is used to estimate the model. This is to eliminate the cross-sectional specific effects and also address the small sample bias associated with LSDV dynamic panel estimations (Nickell, 1981). However this does not effectively address the endogeneity problem or cross-sectional dependence of the error term.

Consequently, the two-step system GMM estimation technique of Arellano and Bover (1995) with forward orthogonal deviations and robust standard errors is employed for robustness. Cross-sectional specific effects are eliminated using forward orthogonal deviations instead of the usual differencing approach. This is because the differencing approaches have been found to either maximise data loss due to the use of higher lags of regressors as instruments or generate weak instruments due to their inability to effectively eliminate serial correlation. Using forward orthogonal deviations instead of 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). 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 and also for robustness 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. Real GDP per capita which represents home country income is instrumented for using the terms of trade of the SADC countries in the panel. This is because real GDP per capita is a highly persistent series therefore a one period lag is a weak instrument for

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[8] The bias correction is initialised through a Blundell and Bond (1998) estimator

subsequent changes (Roodman, 2008)[9]. These initial diagnostics and estimations are carried out in EViews7 and STATA 11, using the collapse option in the two step system GMM estimation to address the possibility of instrument proliferation so as to obtain a robust Hansen (1982) test statistic for the validity of over-identification restrictions and Difference-in-Hansen test statistic for the exogeneity of the instrument subset.

4.   Empirical results

The empirical results are detailed in Tables 8 (sample wide results) and 9 (country specific results) below. From the dynamic two-step system generalised method of moments results in Table 8 the coefficient of lagged remittances is positive and significant at 1% level. 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.

INSERT TABLE 8

Consistent with earlier expectations from the cross-correlation analysis the coefficient of home country income is negative and statistically significant at 1% level. This indicates altruistic patterns in remittances sent home by SADC migrants in South Africa. The coefficient of host country economic conditions is negative and statistically significant at 1% level. 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 their incomes in South Africa. The coefficient of interest rate differential is positive and significant at 1% level depicting the potential of SADC migrants to take advantage of investment opportunities back home. This contradicts the cross-correlation analysis and modifies

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[9] The real income per capita of South Africa was still used in place of the composite variable to represent the migrant's income in the host country since it yielded more meaningful results than alternative instruments.

initial findings by Katseli and Glystos (1986), who found no relationship between remittances and a positive interest rate differential. As expected the coefficient of the quality of financial service delivery (M2) is positive and statistically significant at the 1% level. This aligns with earlier findings by Gupta (2007) 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 in the two-step system GMM estimation, but positively signed and significant at 1% level in the LSDV estimation. This gives some indication that remittances from South Africa to the SADC countries increase with a depreciating exchange rate. This needs to be interpreted with caution. A depreciating exchange rate signifies deteriorating economic conditions and therefore would increase with altruistic remittance inflows. Additionally, although a representative migrant might remit the same amount of money as in previous periods, the depreciating exchange rate would lead to an increase in the amount received by his family back home in local currency units. This is synonymous to an increase in remittance inflows. Furthermore if migrants take advantage of investment opportunities under a depreciating exchange rate then these investment opportunities are more likely to be physical assets[10] such as land or housing than financial assets. Under such circumstances the depreciating exchange rate results in more local currency units for the same amount remitted which can then afford a larger bundle of goods and services than in previous periods (Acosta et al. 2007).

The results of the two step system GMM seem quite similar to the LSDV results and also meet all post-estimation robustness checks. Specifically, the Arellano and Bond (1991) test for second order serial correlation fails to reject the null of no autocorrelation. The Hansen (1982) test for over-identification fails to reject the null that the over-identification restrictions are valid whiles the Difference in Hansen test also fails to reject the null that the instrument subset is strictly exogenous.

The result of the SUR estimation in Table 9 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.

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[10] Since the acquisition of physical assets such as housing entails an interest rate component in its pricing, we use the interest rate differential generically to represent investment opportunities in the home country, irrespective of the nature of the investment opportunity, whether financial or physical. The sign of the coefficient of the exchange rate would determine whether the investments are likely to be financial assets or physical assets.

INSERT TABLE 9

Beside the sample wide results country level differences exist. It can be observed from Table 9 that for Botswana, Mozambique, Seychelles, Swaziland and Tanzania the coefficient of home country income is negative and statistically significant. The coefficient of host country economic conditions 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 money home when their incomes improve in South Africa. The coefficients of home country income and host country economic conditions are statistically insignificant for Lesotho, Madagascar and Malawi. This means 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 income is positive and statistically significant, while the coefficient of host country economic conditions 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 increase in South Africa.

The coefficient of the quality of financial service delivery 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 services to directing remittance inflows through formal channels and thereon for more productive uses (Gupta et al. 2007). 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 investment opportunities back home, while remittances of migrants from Botswana, Seychelles, Tanzania, Zambia, Madagascar, Mauritius and Mozambique are not driven by 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.

5.   Conclusion, policy implications and future research

The empirical results show that when cross-sectional dependence of the error and individual effects are controlled for remittances from South Africa to the 10 SADC countries in the panel are jointly driven by both altruism and self interest motives. However in the sample wide results, an increase in the migrant's income due to improvements in economic conditions of the host country does not translate into increased remittances sent home. This is characteristic of countries with a high degree of economic and policy integration as found by Coulibaly (2009). It is also expected that the migrant would know approximately how much is required on monthly basis to supplement the family budget back home. Thus barring any unexpected and drastic occurrences approximately the same amount is remitted back home each time. On the whole SADC migrants in South Africa would take advantage of investment opportunities in their home countries, modifying earlier findings by Katseli and Glystos (1986) who found no relationship between remittances to developing countries and a positive interest rate differential. The quality of financial service delivery 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). Thus to mitigate the use of informal channels or maximise the impact of remittances on development outcomes financial services must be well developed and more compatible to the needs and wants of migrants and their families. The associated regulations should be more facilitative of market development.

Country specific analysis using the SUR results in Table 9 gives deeper insight into the sample wide results highlighting country specific differences. 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 the quality of financial service delivery, coupled with the negative and statistically significant coefficient of the 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 investment opportunities back home, under a stable or strong exchange

rate. On the contrary, migrants from Botswana, Mozambique, Seychelles, Swaziland and Tanzania exhibit altruistic remittance patterns. They also remit more money home when their incomes increase in South Africa. Consequently, the country specific results show that the policy 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. This is because while self interest motives prevail in some countries, altruism prevails in others. Where self interest prevails policy makers would have to focus on ensuring a stable exchange rate whiles financial service providers would have to design products and services with attractive returns 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. 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.

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, whiles migrants from countries farther away like Seychelles and Tanzania 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 gives 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 due to the high degree of regional integration and interdependences between the countries in the panel. The use of the requisite estimation techniques that correct for these characteristics 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 interventions.

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APPENDIX

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

	ZAR	BOT	LES	MDG	MLW	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

Table 2: Sources and definition of variables

	Variable	Source	Definition
REM	Remittances as a percentage of GDP	World Bank	Worker's remittances and compensation of employees as a percentage of GDP in current prices (US$ Millions).
TOT	Terms of trade in SADC countries as an instrument for home country income	World Bank	Ratio of exports prices to import prices of the SADC countries in the panel.

Ym	Migrant's income in the host country (South Africa)	World Bank	Annual GDP per capita of South Africa in 2000 constant prices.	
M2	Quality of financial service delivery	World Bank	Money and quasi money as a percentage of GDP in home country.	
Idif	Interest rate differential	IMF, World Bank	Differential between the deposit interest rate in SADC countries and in South Africa.	
RER	Real exchange rate	IMF, World Bank	Product of the nominal exchange rate to the rand and the ratio of the CPI of South Africa (2000 = 100) to the aggregate price level (GDP deflator 2000 = 100) for the SADC countries.	

Table 3: Descriptive statistics of variables

Variable	Mean	Min	Max	Obs.
REM	6.22	0.09	46.11	150
GDPC	1 772.88	123.56	8 208.23	150
Ym	3 195.05	2933.72	3 795.95	150
M2	34.32	11.89	117.36	150
Idif	-1.34	-14.29	25.59	150
RER	249.39	-656.58	11554	150
TOT	101.96	74.06	306.55	150

Table 4: A priori expectations

Variable	Sign	Inference
TOT[1]	negative/ positive	A negative relationship between remittances and home country income would mean that migrants remit their families back home during adverse economic conditions, signifying altruism. A positive relationship means migrants remit home during favourable economic conditions, which is consistent with self interest or returns seeking motives.
Ym	negative/ positive	A negative relationship means the migrant remits less money back home when his income in the host country improves. A positive relations means the migrant remits more money back home when his income in the host country improves.
M2	negative/ positive	A negative relationship means the quality of financial service delivery is poor in which case remittances smooth access to finance constrains. A positive relationship means the quality of financial service delivery is key to enhancing the flows of remittances through formal channels.
Idif	negative/ positive	A negative relationship means higher home country interest rates which represent investment opportunities back home does not attract remittances inflows, whiles a positive relationship means migrants would respond to investment opportunities back home, consistent with self interest or returns seeking motives.
RER	negative/ positive	A negative relationship means an exchange rate appreciation attracts remittances home, consistent with self interest or returns seeking motives, since returns on investment are assumed to be in home country currency units. A positive relationship means exchange rate depreciation and consequently adverse economic conditions attract remittances home, consistent with altruistic motives and self interest remittances aimed at acquiring physical assets.

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[1] Instrument for GDP per capita in SADC countries representing home country income of the migrant's family

Table 5: Cross-correlations of variables (contemporaneous)

Variables	REM	REM(-1)	Idif	M2	GPCC	Ym	RER
REM	1						
REM(-1)	0.98***	1					
Idif	-0.09	-0.10	1				
M2	0.01	-0.01	-0.10	1			
GDPC	-0.20**	-0.20**	-0.15**	0.83***	1		
Ym	-0.08	-0.08	0.10	0.09	0.08	1	
RER	-0.10	-0.10	-0.10	-0.10	-0.14*	-0.08	1

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

Table 6: Order of integration of the variables

Variable	I(*d*) Levels	I(*d*) Difference	Obs.
REM	I(0)		150
Ym	I(1)	I(0)	150
M2	I(1)	I(0)	150
Idif	I(0)		150
RER	I(1)	I(0)	150
TOT	I(0)		150

Table 7: Initial diagnostic tests

Test	Test Statistic	Critical Value	Inference
Joint validity of cross-sectional effects $H_0 : \mu_1 = \mu_2 \ldots \mu_{N-1} = 0$ H_A : *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 $H_0 : \lambda_1 = \cdots \lambda_{T-1} = 0$ H_A: *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.
Serial correlation (two-way model) (Durbin Watson Test for first order serial correlation, given fixed effects) $H_0 : \rho = 0;\quad H_A = \rho > 0$	d_p = 1.517	$d_p <$ 1.8164	First order serial correlation given fixed effects.
Heteroscedasticity $H_0 : \sigma_i^2 = \sigma^2$ H_A : *Not equal for all i*	LM = 47.83	$\chi^2_{(10)}$ = 18.31	There is heteroscedasticity present.
Hausman specification test $H_0 : E(\mu_{it}/X_{it}) = 0$ $H_0 : E(\mu_{it}/X_{it}) \neq 0$	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 : corr $(\mu_{i,t}, \mu_{j,t}) = 0$ for $i \neq j$ H_A : corr $(\mu_{i,t}, \mu_{j,t}) \neq 0$ for some $i \neq j$	LM = 78.43	Prob = 0.0015	Cross-sections are inter-dependent

Table 8: Empirical results: Ordinary Least Squares (OLS), Least Square Dummy Variable (LSDV) and Two-step system Generalised Method of Moments.

Dependent variable REM[2]

Variable	OLS	LSDV	Two-step system GMM Arellano and Bover (1995)
REM(-1)	0.97***	0.95***	0.86***
	(0.01)	(0.11)	(0.04)
LTOT	-0.36***	-0.36	-0.55***
	(0.12)	(0.37)	(0.11)
LYm	0.28	-0.11***	-0.20***
	(0.21)	(0.03)	(0.11)
Idif	0.03***	0.05**	0.04***
	(0.01)	(0.02)	(0.01)
M2	0.01***	0.03**	0.04***
	(0.01)	(0.01)	(0.01)
RER	0.00001***	0.10***	0.001
	(0.0001)	(0.02)	(0.004)
Adjusted R^2	0.99		
ABond test for second order serial correlation			Prob > z = 0.48
Hansen test for over-identification			Prob > χ^2 = 0.49
Diff. in Hansen test for exogeneity of instrument set			Prob > χ^2 = 0.58

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

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[2] The LSDV employed the Kiviet (1995) small sample bias correction. The two–step system GMM estimation involved forward orthogonal deviations instead of differencing using the "collapse" option in STATA, instrumenting for GDP per capita which represents home country income with terms of trade.

Table 9: Seemingly unrelated regressions

Dependent variable REM

|	BOTS	LES	MDG	MLW	MUS	MOZ	SEY	SWZ	TAN	ZAM
REM(-2)	-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]
LTOT	-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]
LYm	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]
Idif	0.04 [0.03]	0.15*** [0.03]	-0.01*** [0.004]	0.06*** [0.01]	-0.17*** [0.03]	0.05* [0.02]	-0.06 [0.18]	-0.28** [0.11]	-0.02 [0.04]	0.02 [0.08]
M2	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]
RER	-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 [0.48]	-0.02*** [0.003]	0.002 [0.003]

Breusch-Pagan test of independence: $\chi^2_{(45)}$ = 50.77   Prob = 0.26

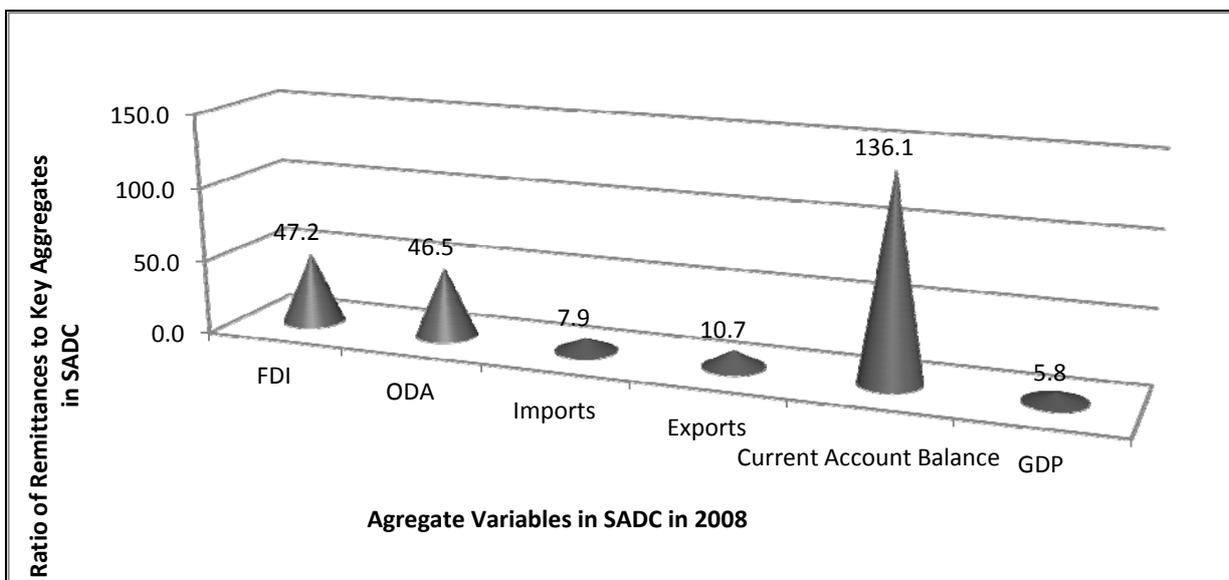| **Correlation matrix of residuals (Remittances)**										
Botswana	1									
Lesotho	-0.55	1								
Madagascar	0.02	-0.01	1							
Malawi	-0.18	0.32	-0.14	1						
Mauritius	-0.33	0.01	-0.52	-0.37	1					
Mozambique	-0.10	0.32	-0.09	0.40	-0.04	1				
Seychelles	0.25	-0.39	0.08	-0.15	-0.27	0.18	1			
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 [ ]

Figure 1: Remittances as a ratio to GDP in SADC countries in the panel in 2008
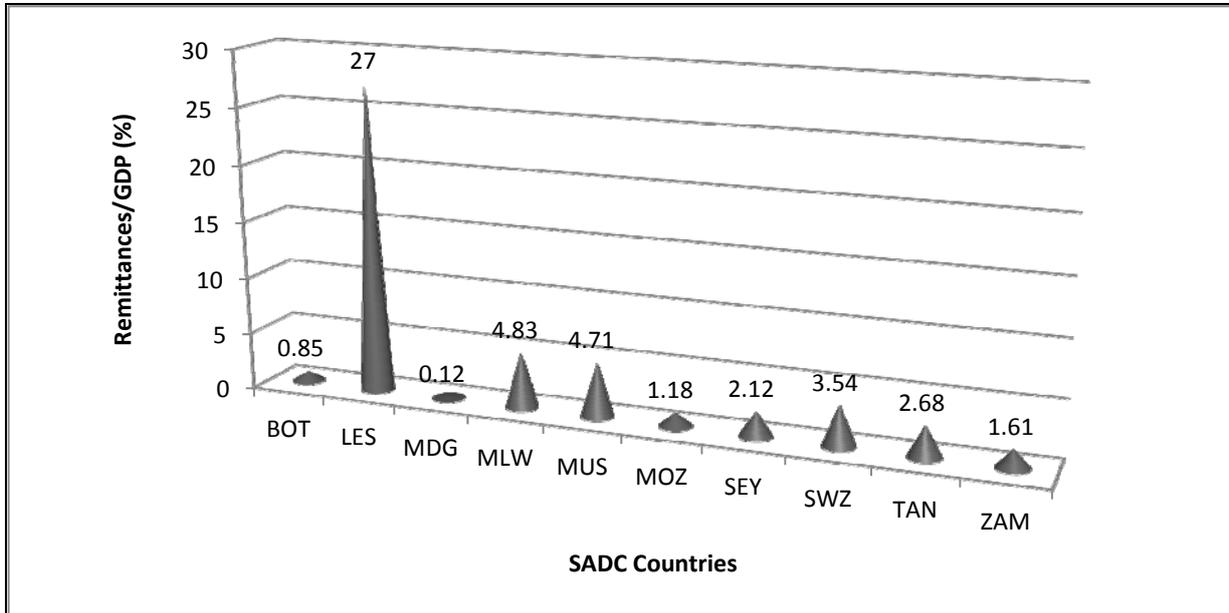
Data Source: World Development Indicators, World Bank

Figure 2: Ratio of Remittances to Regional Aggregates in SADC countries in 2008

Data Source: World Development Indicators, World Bank