1-1-2010

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Arusha V. Cooray
University of Wollongong, arusha@uow.edu.au

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Keywords

Migrant, remittances, financial, sector, development, Government, ownership, Banks

Disciplines

Business | Social and Behavioral Sciences

Publication Details

Cooray, A. (2010). Migrant remittances, financial sector development and the Government ownership of Banks. European Economics and Finance Society Conference (pp. 1-27). Athens, Greece: European Economics and Finance Society.

MIGRANT REMITTANCES, FINANCIAL SECTOR DEVELOPMENT AND THE GOVERNMENT OWNERSHIP OF BANKS

Arusha Cooray*

Abstract: This study investigates the influence of migrant remittances on two dimensions of the financial sector, namely, *size* and *efficiency*. Evidence suggests that migrant remittances contribute to increasing the size and efficiency of the financial sector. The study, in addition, examines the impact of remittances on financial sector size and efficiency through the government ownership of banks channel. While the results suggest that remittances lead to larger increases in financial sector size in countries in which the government ownership of banks is lower and increases in efficiency in countries in which the government ownership of banks is higher, the government is found to play an important role in promoting financial sector development.

JEL Codes: F24, G21, O16, O57, R58

Keywords: Migrant remittances, financial sector size, financial sector efficiency, government ownership of banks, system GMM.

* Correspondence: Arusha Cooray, School of Economics, University of Wollongong, Northfields Avenue, NSW 2522, Australia, Tel: 61-2-4221-4017; E-mail: arusha@uow.edu.au.

1. Introduction

Migrant remittances into the developing economies have increased by 526% from US$ 31,058 million to US$ 194,349 over the 1990-2005 period (World Bank 2009) accounting for the second largest source of international inflows next to foreign direct investment. A financial system channels funds from savers to borrowers, thereby playing a vital role in an economy's growth process. Migrant remittances can promote financial development in the recipient countries by increasing the volume of deposits with financial institutions. By increasing the availability of credit and banking services to the public such as savings accounts and small scale loans, remittances can also bring a larger proportion of a country's 'unbanked' population in contact with the formal financial system (IMF 2005). Remittance inflows into the low and middle income economies have been found to reduce poverty (Adams and Page 2003), promote economic growth (Mundaca 2009), provide capital for micro enterprises (Woodruff and Zenteno 2001), reduce output volatility (Chami *et al*. 2009) and lead to exchange appreciation (Rajan and Subramanian 2005, and Lopez, Molina and Bussolo 2007). Barajas et al. (2009) however, find no evidence of a relation between workers' remittances and economic growth, while Abih *et al*. (2008) show that remittance inflows can lead to a decline in institutional quality. The relation between remittances and the financial sector has been examined in the studies of Giuliano and Ruiz-Arranz (2009), Aggarwal, Demirguc-Kunt and Martinez Peria (2006), Orozco and Fedewa (2005), Munduca (2009), Gupta, Pattillo and Wagh (2009) among others. Giuliano and Ruiz-Arranz (2009) conclude that remittances can promote economic growth in the developing economies by enhancing financial sector development, particularly in financially less developed economies. Aggrawal *et al.* (2006) find that migrant remittances lead to financial sector development in the developing economies by leading to increases in the aggregate volume of deposits and credit intermediated by the banking sector. In a case study of nine financial institutions in South America, Orozco and Fedewa (2005) show that financial institutions' distribution of transfers, and financial services provided depend on the resources of the institution and its existing presence in the community. Mundaca using a panel dataset from Latin America shows that remittances can further promote economic growth in economies with well developed financial markets. Modelling the entry of banks into the remittance market, Alberola and Salvado (2006) observe that banks as opposed to smaller money transmitter operators, have the ability to offer lower remittance transmission fees thereby increasing the volume of remittances into recipient countries. Freund and Spatafora (2008) on the other hand, argue that formal transmission channels such as banks are more expensive compared to informal transmission channels. In a panel dataset covering 104 countries, they show that remittances are transmitted through formal channels in countries which have well developed financial systems. The informal sector is large in countries in which exchange rate spreads are large, in particular, Sub-Saharan Africa, Eastern Europe and Central Asia. Examining the effect of remittances on poverty and financial development in Sub-Saharan Africa, Gupta *et al*. (2009) find that remittances have a positive effect on both poverty and financial development. Acosta *et al* (2009) investigating the effects of remittances on the exchange rate on 109 developing and transition economies find that the upward pressure on exchange rates brought about by the increase in remittances, are lower in countries with well developed financial markets.

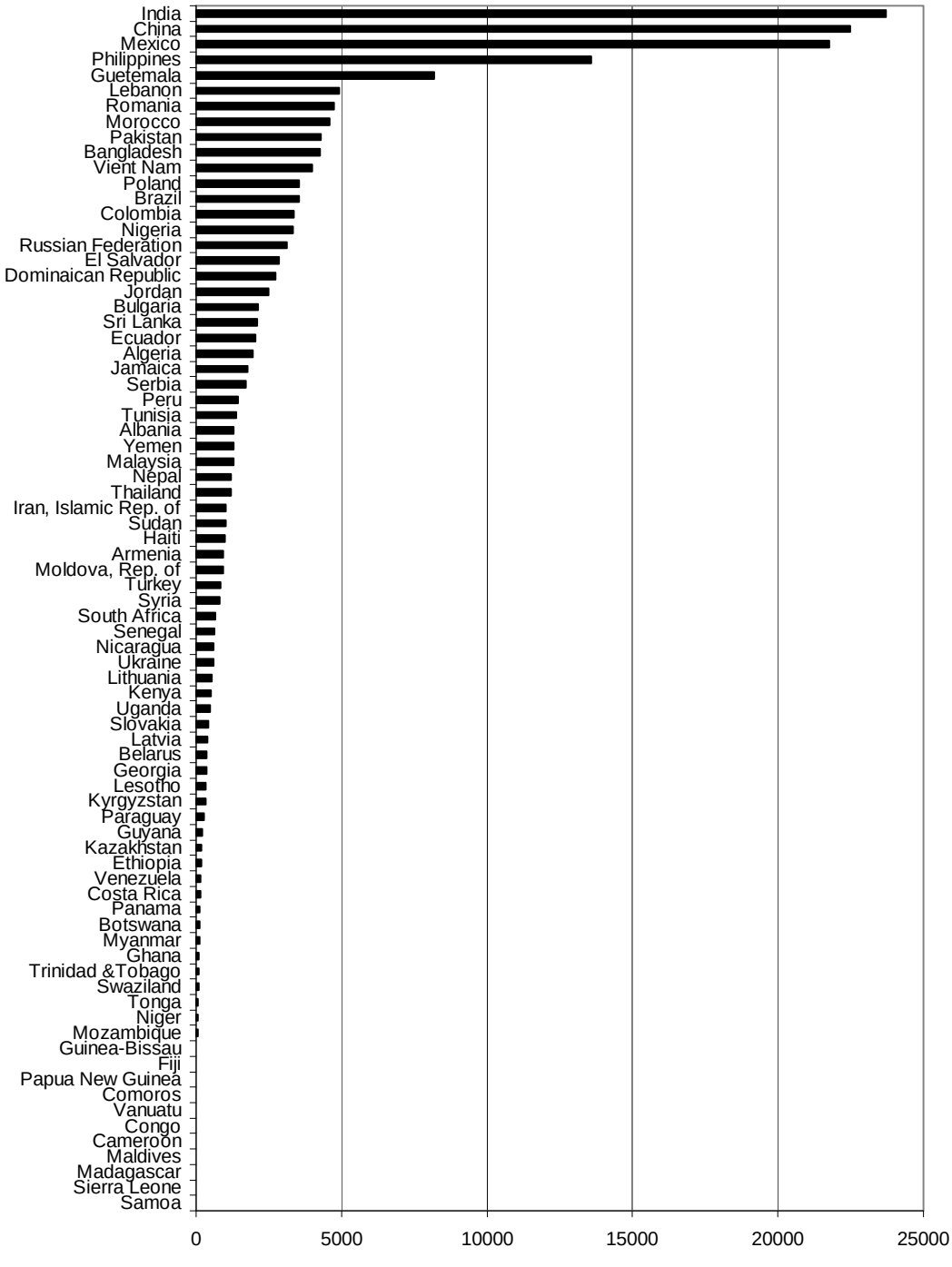
This study is closely related to the literature that investigates the relation between remittance flows and the financial sector. The studies hereto have explored the effects of remittance inflows on financial sector size. The majority of studies undertaken on the impact of remittances on financial sector size as measured by the ratio of deposits/GDP, private credit/GDP and liquid assets/GDP, show that migrant remittances have a positive influence on financial sector size. This study differs from the previous literature in that it not only examines the effect of migrant remittances on financial sector *size,* but also *efficiency*. In addition, the present study investigates if the impact of remittances on financial sector size and efficiency are conditional on the degree of government ownership of banks. The impact of remittance inflows on financial sector efficiency as measured by overhead costs and net interest margins is unknown. If remittances lead to an increase in efficiency this would benefit the public due to reduced overhead costs and net interest margins. Increases in overhead costs and net interest margins on the other hand, would lead a fall in financial sector efficiency. A related issue that has not been explored is, the role played by government owned banks, in determining the magnitude and efficiency of remittances. In the developing economies, the government plays a major role in setting up banks in rural areas providing access to finance. The political view argues that the government, by pursuing its own political objectives is subject to conflicting interests which can lead to inefficient outcomes, primarily in economies with weak property rights. This could lead to increased interest margins and overhead costs. The development view on the other hand, argues that the government can help overcome market failures and promote development through lower costs and increased access to finance, particularly in the developing economies. Government ownership can also play an important role in retaining savings within a financial system where regulation is not of high quality (Shortland 2009). Consequently the contribution of this study is threefold: one, to investigate the effects of migrant remittances on financial sector size; two, to examine the effect of remittances on financial sector efficiency; and three, to explore the relation between migrant remittances and financial sector development through the government ownership of banks channel.

The rest of this paper is structured as follows. Section 2 examines some country characteristics. Section 3 states the hypotheses. Section 4 describes the data and estimation methodology. Section 5 presents the empirical results, and conclusions are summarised in Section 6.

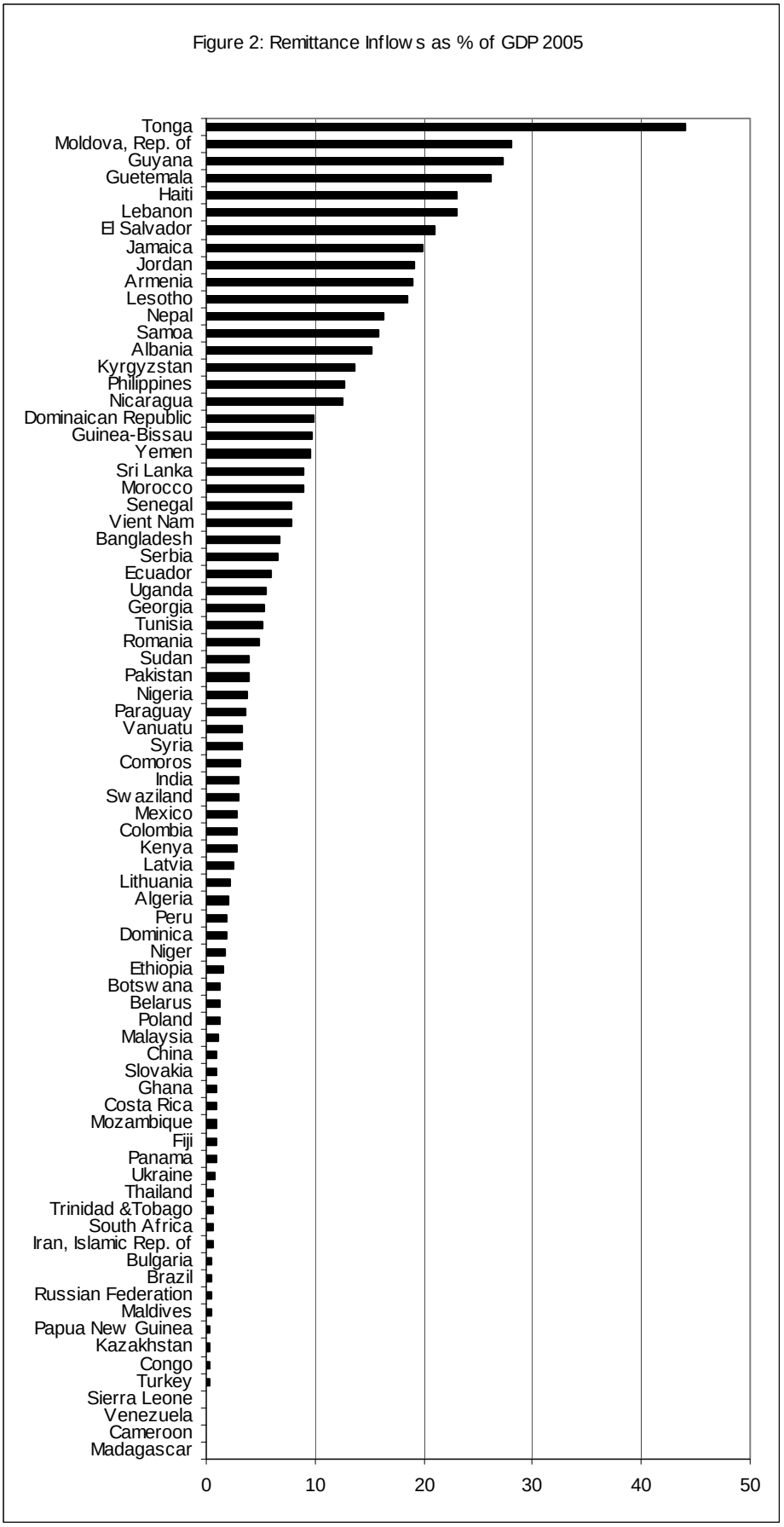
2. Country Characteristics

Figures 1 and 2 show remittance receipts for the countries in the sample in US $ million and as a percentage of GDP respectively, for 2005. The largest five recipients of remittance inflows in the sample in absolute terms are India (US $23,725 million), China (US $22,492 million) Mexico (US $21,772 million), the Philippines (US $13,566 million) and Guatemala (US $8180 million). The largest five recipients of remittance inflows as a percentage of GDP are: Tonga (44%), Moldova (28%), Guyana (27%), Guatemala (26%) and Haiti (23%). Figure 3 plots the relation between deposit money bank assets to GDP and the log of migrant remittances to GDP. This preliminary analysis suggests a positive relationship between the two variables.

Figure 1: Remittance Inflows 2005 (US$ Million)

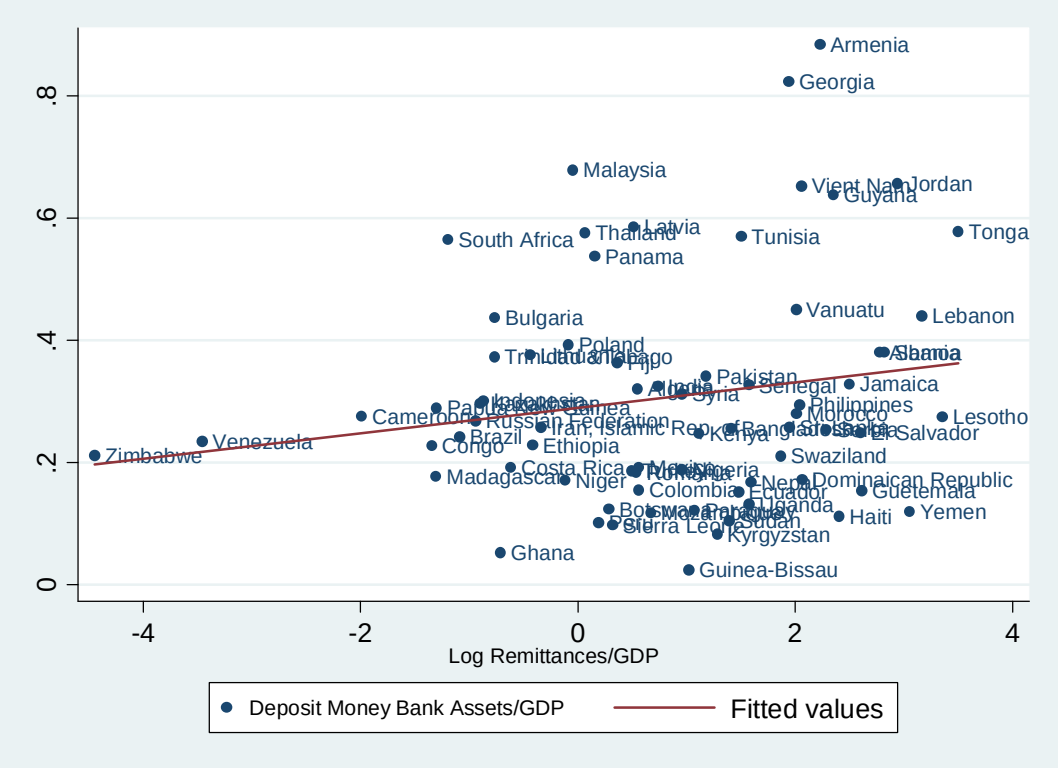


Source: Global Development Finance 2007



Source: Global Development Finance 2007

Figure 3: Deposit Money Bank Assets/GDP and Remittances to GDP Average 1990-2005



Note: The regression represented by the fitted line reports a coefficient of 0.021 (Robust SE = 0.011), N = 69, $R^2 = 0.03$ from a regression of log remittances/GDP on deposit money bank assets/GDP.

[Table 1, about here]

Table 1 groups the countries by the level of government ownership of banks. The overall mean for the government ownership of banks for all countries in the sample is 50%, suggesting that the government ownership of banks in general, is relatively high. Hence, countries in which the government owns over 50% (above the mean) of bank assets are classified as high government bank ownership countries and those in which the government owns less than 50% (below the mean), low government bank ownership countries. An examination of the averages for the two groups- high and low government ownership - indicate that the ratio of deposits, liquid liabilities and private credit to GDP are higher in the low government ownership group. The low government ownership group has a lower net interest margin (a mean of 0.057 as opposed to 0.066 for the high state ownership group), while overhead costs are lower in the high government ownership group (a mean of 0.046 as opposed to 0.057 for the low government ownership group). Note that migrant remittances in absolute terms are higher in the high government bank ownership group while migrant remittances to GDP are higher in the low government bank ownership group. Hence, a question that arises at this point is, do migrant remittances lead to increases in financial sector development in countries with high or low bank ownership?

3. Hypothesis

This study tests the hypotheses that:

1) Migrant remittances influence the size of the financial sector

2) Migrant remittances influence the efficiency of the financial sector.
3) Despite the fact that remittances can affect the financial sector through a number of channels, this study then goes on to investigate if remittances influence the financial sector through the government ownership of banks channel. To test this hypothesis, the remittance variable is interacted with the government ownership of banks. This interaction term will show the degree to which the prevalence of state owned banks matter for the influence of remittances on financial sector development. A negative interaction term on the financial sector size equations would indicate that remittances lead to increases in financial sector size in countries with a low government ownership of banks while a positive interaction term would imply that remittances lead to increases in financial sector size in countries with a high government ownership of banks. A negative interaction term on the financial sector efficiency equations would imply that remittances lead to a fall in overhead costs and net interest margins in countries with a high government ownership of banks, and a positive interaction term that remittances lead to a fall in overhead costs and net interest margins in countries with a low government ownership of banks.

Migrant Remittances, Government Ownership and the Size and Efficiency of the Financial Sector

Remittances are an important, and sometimes, the only means of access to financial services by households in low income economies. Remittances can enable low income households to accumulate funds which can be used to finance future consumption or investment. These funds can also be used to smooth consumption in the event of unexpected fluctuations in income (Yang and Choi 2007). Remittances can therefore help low income households to minimise the impact of negative shocks thus reducing their vulnerability. The accumulation of savings in turn, can create the opportunity for lending these funds back into the community. The availability of credit can enable the public to diversify their portfolios, and gain access to borrowing. Consequently, in the developing economies, remittances can play an important role in not only providing financial access to the rural poor, but also serve as an important means of bringing a large proportion of those using informal channels into the mainstream. Thus, remittances have been found to have a positive impact on financial sector size (Giuliano and Ruiz-Arranz 2009, Aggarwal *et al.* 2006, Orozco and Fedewa 2005, Gupta *et al.* 2009). Increasing financial access by improving liquidity, can in turn lead to lower transactions costs and net interest margins. Migrant remittances can permit banks to further subsidise loans which does not necessarily imply increased efficiency, but nonetheless, will lead to a fall in net interest margins. Similarly, remittances can provide banks with access to funds that can contribute to a fall in overhead costs. If on the other hand, remittances allow banks to earn monopolistic profits, this will lead to increases in net interest margins and overhead costs. A number of measures are being taken by the governments of the developing economies to increase financial inclusion. In Uganda for example, banks now have centralised databases and money can be sent to any part of the country within the same branch network in seconds at no, or minimal cost. Banks have in addition, introduced improved infrastructure and various financial literacy programmes (East African 2009). A number of countries in South America, Asia and Africa, have introduced mobile phone banking. “With new technology and computerisation of banking operations, new remittance products have been introduced in the market, which have increased the speed, cost-effectiveness and efficiency of the payments and settlement system. These include the National Electronic Funds Transfer (NEFT), Electronic

Clearing System (ECS), Real Time Gross Settlement (RTGS) and ongoing endeavour at cheque truncation system leading to a national payment and settlement system" (Mohapatra 2009). These measures can be expected to increase access to finance and lower overhead costs and net interest margins. Despite the introduction of these measures by the government to increase banking outreach, a large proportion of the population in the middle and particularly low income economies still remain unbanked. Therefore the question of whether the size and efficiency of a financial sector is higher in economies with a high or low prevalence of government owned banks is one that needs to be investigated.

4. Data and Estimation Methodology

4.1 Data

The study uses annual data over the 1990-2007 period for 98 countries. See Data Appendix for list of countries, data sources and explanation. The sample constitutes a representative cross section of the regions covering Eastern Europe and Central Asia, the Middle East and North Africa, Latin America and the Caribbean, East Asia and the Pacific, South Asia and Africa. The high income OECD countries are excluded from the analysis as the channels through which remittance inflows influence the financial sector in these economies are likely to be different from other regions. It is estimated that a large proportion of remittance flows are transmitted through informal channels. A limitation of the study therefore, is that it is only able to capture official flows that are transmitted through formal channels[1]. The dependent variables in the study are the financial sector size and efficiency variables. Financial sector size is measured by: (1) the ratio of deposit banks assets to GDP (2) liquid assets to GDP (3) domestic credit by deposit banks and other financial institutions to the private sector as a ratio of GDP. The provision of credit by the banking sector to the private sector is also an indicator of the degree of activity of financial intermediaries. Financial sector efficiency is measured by (1) the value of banks' net interest margin to total assets, and (2) banks' overhead costs to total assets. Increased competition in the financial sector should reduce overhead costs and interest margins. Therefore, if these measures are low it would imply increased efficiency and vice versa. These financial sector indicators are used by Aggarawal, Demirguc-Kunt and Martinez Peria (2006), Beck, Demirguc-Kunt and Levine (2003), among others.

The main independent variable in the study is the ratio of migrant remittances to GDP. These are formal remittances that are recorded in the National Accounts. Remittances are defined as the addition of migrant remittances and compensation of employees. These include current transfers by migrant workers and wages and salaries earned by non resident workers. Other independent variables in the preliminary estimation include, the initial level of per capita income to capture the level of development of a country, openness and inflation variables based upon the previous literature. Studies have shown that current and capital account liberalisation have a favourable impact on financial sector development (see Chinn and Ito 2002, Aggarwal et al. 2006). The ratio of exports to GDP, the ratio of foreign direct investment to GDP and a dummy variable for the exchange rate regime are used to capture the degree of openness of an economy. If a country follows some form of fixed/managed/ crawling peg exchange rate regime, a dummy variable of one is assigned to it and zero

[1] A study by Freund and Spatafora (2005) empirically estimate informal remittance flows. According to them, informal remittance flows account for about 35%-75% of official remittances to developing economies.

if the currency is allowed to float independently. Inflation can discourage financial intermediation (see Aggarwal et al. 2006) and also act as a proxy for uncertainty and risk (see Giuliano and Ruiz-Arranz 2009). Therefore inflation is used an explanatory variable in the empirical estimation that follows.

Additional control variables are used in the estimation that follows, to test the robustness of the results to the choice of variables. A well developed financial system requires a proper legal and regulatory framework. La Porta *et al*.(1997) show that countries in which legal systems provide proper protection to investors against expropriation by entrepreneurs, are likely to have larger and better developed financial markets. They argue that countries with English Common law origin provide the highest investor protection while countries with French law origin provide investors with the least protection. Hence, a dummy variable is created for French legal origin. This dummy variable takes on a value of one for French legal origin and zero otherwise. As migration is likely to be higher from conflict ridden states, a dummy variable of one is assigned if a country experienced a conflict during the period under study, that is, 1990-2007, and zero otherwise. The level of financial literacy of a society can positively impact upon the volume of remittances transmitted through formal channels and thereby on financial sector development. Secondary school enrolment is used as a proxy for the level of financial literacy. A well developed financial system also requires to be accompanied by the necessary infrastructure and technological know-how. This is captured by the ratio of gross domestic fixed capital formation to GDP. As increased government expenditure can increase bank concentration and reduce competitiveness by crowding out private sector investment expenditure, the share of public consumption to GDP is also considered. Beck, Demirguc-Kunt and Levine (2003) show that increased ethnic/religious fractionalisation can impede financial sector development. Culture is found to be associated with financial sector development also in Stultz and Williamson (2003). Therefore the religious fractionalisation measure of (Alesina *et al*. 2003) is employed to capture culture.

To investigate the hypothesis that remittances affect the financial sector through the government ownership of banks channel, the ratio of migrant remittances to GDP is interacted with the government ownership of banks from LaPorta, Lopez-De-Sinales and Shleifer (2002) and Barth, Caprio and Levine (2001)[2].

4.2 Estimation Methods

The study uses both pooled OLS and system GMM methods to estimate the influence of remittances on the financial sector.

The following model forms the basis of the preliminary OLS estimation:

$$F_{ii} = aR_{it} + \boldsymbol{x}_{it}\beta + \upsilon_{it} \qquad (1)$$

where F_{it} is the financial sector variable for country i in period t. R_{it} is the remittance variable for country i in period t All control variables mentioned in Section 4 are captured by the vector $\boldsymbol{x}_{it}$. υ_i is a random error term that captures all other variables.

[2] Note that in La Porta et al. (2001) the government ownership of banks is defined as the ownership of deposits by the government in the 10 largest commercial and development banks. In Barth et al. (2001) the government ownership of banks is defined as the ownership of deposits by the government in the 5 largest banks.

In order to exploit the time series dimension of the data and individual country specific effects correcting for any endogeneity bias in the explanatory variables, the Arellano-Bover (1995)-Blundell Bond (1998) system GMM method is used. Here the levels equation (2) is combined with a first difference equation (3). The equation in levels (2), is instrumented with lagged first differences of the variables, while the equation in first differences, (3), is instrumented with lagged levels of the variables. Blundell and Bond (1998) show that when there are time-invariant regressors, the lagged levels of the explanatory variables can be weak instruments for the variables in differences. The system GMM method enables estimating the equation not only in first differences but also in levels permitting the inclusion of time invariant regressors which would disappear in difference GMM (Roodman 2006).

$$F_{it} = \gamma F_{it-1} + aR_{it} + \boldsymbol{x}_{it}\beta + \mu_i + \eta_i + \upsilon_{it} \qquad (2)$$

$$F_{it} - F_{it-1} = \gamma(F_{it-1} - F_{ii-2}) + a(R_{it} - R_{ii-1}) + \beta(\boldsymbol{x}_{it} - \boldsymbol{x}_{it-1}) + \mu_i + \eta_i + (\upsilon_{it} - \upsilon_{it-1}) \qquad (3)$$

The variable definitions are the same as for equation (1) with the lagged values of the variables now entering the equations and μ_i representing a country specific effect and η_i, a fixed time effect. The GMM estimator is based on the assumption that the error terms are not serially correlated and that the explanatory variables are weakly exogenous or not correlated with future realizations of the error terms under which the following moment condition holds for the first difference estimator:

$E[F_{it-s}(\upsilon_{it} - \upsilon_{it-1})] = 0$; $E[R_{it-s}(\upsilon_{it} - \upsilon_{it-1})] = 0$; $E[\boldsymbol{x}_{it-s}(\upsilon_{it} - \upsilon_{it-1})] = 0$ where i = 1…..n, t = 3….T and s≥ 2.

and as mentioned above the levels equation is instrumented with lagged first differences of the variables which leads to the additional moments condition:

$E[\Delta F_{it-s}(\mu_i + \upsilon_{it})] = 0$; $E[\Delta R_{it-s}(\mu_i + \upsilon_{it})] = 0$; $E[\Delta \boldsymbol{x}_{it-s}(\mu_i + \upsilon_{it})] = 0$ for s =1.

Two diagnostic tests are carried out on the system GMM estimates. The Hansen test for over-identifying restrictions under which the null hypothesis is that the instruments are not correlated with the residuals. The second is the Arellano-Bond test for second order correlation in the first differenced residuals.

5. Empirical Estimation

OLS Estimation

Table 2 presents OLS results for the model. The dependent variable in column (1) is Deposit Money Bank Assets/GDP, column (2) Private Sector Credit/GDP, column (3) liquid assets/GDP, column (4) overhead costs and column (5) net interest margin. Estimation is initially carried out with migrant remittances to GDP, the level of per capita income, the ratio of exports to GDP, FDI to GDP, and an exchange rate dummy variable, all of which capture the degree of openness of an economy and the rate of inflation as explanatory variables.

[Table 2, about here]

The results indicate that migrant remittances have a positive and significant impact on the financial sector size variables. For example, column (1) indicates that a 1% increase in remittances lead to a 0.04% increase bank deposits and column (2) that a 1% increase in remittances lead to a 0.03% increase in private credit to GDP. An increase in remittances lead to a fall in overhead costs and net interest margins. In Column (4), a 1% increase in remittances lead to a 0.003% decrease in overhead costs and in column (5), a 0.004% decrease in the net interest margin. The estimates on per capita income are statistically significant and suggest that a higher per capita income is associated with an increase in the financial sector size variables and lower overhead costs and net interest margins. The coefficients on the ratio of exports to GDP is

statistically significant in all columns indicating that greater openness contributes to an increase in financial sector size and rise in efficiency. Foreign direct investment is statistically significant in columns (2)-(5). The results suggest that foreign direct investment has a positive effect on financial sector size, also that it contributes to reducing overhead costs and net interest margins. Inflation has a significant negative impact on both financial sector size and efficiency. The estimates on the exchange rate variables are statistically significant in columns (1), (3) and (5) suggesting that exchange controls exert a negative effect on the volume of deposits and liquid assets to GDP and lead to an increase in the net interest margin.

Table 3 estimates the equations with additional control variables mentioned in Section 4. Including the secondary school enrolment ratio reduces the sample size significantly however.

[Table 3, about here]

As before, the variable of interest, migrant remittances, have a significant positive impact on both financial sector size and efficiency. Columns (1), (2) and (3) indicate that a 1% increase in migrant remittances will lead to a 0.04% increase deposit money bank assets/GDP, a 0.03% increase in credit/ GDP and a 0.02% increase in liquid assets/GDP respectively. The French legal origin dummy variable has a significant negative impact on the size and efficiency of the financial sector in all columns. Openness as measured by exports to GDP has statistically significant positive impact on financial sector size and efficiency. FDI is statistically significant only in equation (3). Inflation exerts a significant negative effect on the financial sector size and efficiency variables. In column (1) for instance, a 1% increase in the rate of inflation will lead to a 0.08% fall in deposit bank assets. The coefficient on the exchange rate dummy variable is statistically significant in all equations suggesting that exchange rate controls lead to a fall in the financial sector size variables and a rise in overhead costs and net interest margins. The coefficients on secondary schooling are statistically significant exerting positive impact on financial sector size and efficiency. The coefficients on government consumption are statistically significant in equations (3) and (4) suggesting that increases in government consumption are associated with increases in bank liquid assets and a rise in overhead costs. Population growth has a significant positive effect on financial sector size and also leads to an increase in the net interest margin. Gross domestic capital formation is statistically significant in equation (4) and the coefficients on religious fractionalisation in equations (1), (2) and (5). The results suggest that increased religious fractionalisation leads to a fall in the ratio of bank deposits/GDP and the volume of credit disbursed to the private sector. Religious fractionalisation also leads to a rise in the net interest margin. The conflict dummy variable is significant in all columns except for column (2). An increase in conflict reduces the volume of deposits and the liquid assets held by banks. The results suggest that conflict also causes overhead costs and net interest margins to fall.

GMM Estimation

Table 4 replicates the preliminary regressions in Table 2 using system GMM[3]. The one-step GMM estimator is used in the present study. This yields standard errors that are not only asymptotically robust to heteroskedasticity but have also been found to be more reliable for finite sample estimation (see Blundell and Bond 1998, Bond, Hoeffler, Temple 2001).

[Table 4, about here]

The results for the GMM estimation are consistent with those obtained under OLS estimation in Table 2. The remittance variables continue to be highly statistically significant. Exports to GDP is significant in all columns except for column (4) and FDI is significant in columns (2) and (4). Exchange rate controls have a significant negative impact on deposit money bank assets and private credit, and also lead to increases in overhead costs. Inflation has a significant negative impact on financial sector size and efficiency. The lagged values of the dependent variables are all statistically significant reflecting a high degree of persistency in the variables. The Sargan test for over-identifying restrictions where the null hypothesis is that the instruments are uncorrelated with the residuals, and the Arellano-Bond test for second order serial correlation in the first-differenced residuals, confirm that the moments conditions cannot be rejected.

Table 5 replicates the regressions carried out in Table 3 with additional control variables using system GMM. The results confirm the OLS findings that remittances have a positive impact on financial sector development. French legal origin has a negative influence on financial sector size and efficiency as before. Similarly, exports have a significant positive effect on the financial sector size variables and inflation and exchange rate controls a negative impact on financial sector development. Secondary schooling is statistically significant in columns (1), (3) and (4) and gross domestic capital formation in columns (1), (2) and (4) suggesting the importance of literacy and infrastructure for financial sector development. There is some evidence of a negative effect of religious fractionalisation on financial sector development. Conflict has a negative impact on financial sector size and leads to a fall in the net interest margin and overhead costs.

[Table 5, about here]

Government Ownership, Financial Sector Development and Migrant Remittances

Table 6 reports results for the influence of remittances on the financial sector through the government ownership channel. System GMM is used as this method best addresses the possible endogeneity of migrant remittances and also accounts for the effect of time invariant or very slowly changing government ownership of banks.

[Table 6, about here]

The overall results are consistent with those above with remittances leading to increases in financial sector size and efficiency. The interaction terms on the government ownership of banks x migrant remittances are statistically significant in equations (1), (2) (4) and (5). The interaction terms in columns (1) and (2) suggest that remittances lead to increases in the volume of deposits and private credit in

[3] Although the two-step estimator is more efficient for system GMM, Monte Carlo studies show that the two-step GMM estimator converges to its asymptotic distribution very slowly. In finite samples, the asymptotic standard errors associated with the two-step GMM estimators can be downward biased and thus be an unreliable measure for inference (see Bond, Hoeffler and Temple (2001).

countries with low government bank ownership and the interaction terms in columns (4) and (5) suggest that remittances lead to a fall in overhead costs and net interest margins in countries with high government bank ownership.

The Model Disaggregated by Government Ownership of Banks

Next, the baseline model is re-estimated by dividing the sample into two groups -low and high government ownership of banks (according to the mean level of the government ownership of banks). This is to compare how remittances influence financial sector development in these two groups. The results are reported in Table 7.

[Table 7, about here]

The results are consistent with those obtained above in Table 6. The variable of interest, migrant remittances, have a positive significant impact on deposit money bank assets, private credit and liquid assets to GDP in the low government bank ownership group. Remittances also have a positive significant impact on deposit money bank assets and private credit in the high government bank ownership group. However, the coefficients on the remittance variables in equations (1)-(3) are higher for the low government bank ownership group suggesting that remittances have a larger positive impact on the financial sector size variables in this group. For example, column (1) suggests that a 1% increase in remittances will lead to a 0.03% increase in deposits in the low government bank ownership group as opposed to a 0.02% increase in deposits in the high government bank ownership group. The remittance coefficients in equations (4) and (5) suggest that remittances lead to increased efficiency, or, a larger fall in overhead costs and net interest margins in the high government bank ownership group. The remittance coefficients in columns (4) and (5) are statistically significant for the high government ownership group, however, not statistically significant for the low government ownership group. These results are consistent with those obtained in Table 6 above. An examination of the other variables show that per capita income has a positive impact on the size and efficiency of the financial sector in both groups. An increase in the ratio of exports to GDP exerts a positive significant impact on the financial sector size variables and a fall in the net interest margin. FDI is not statistically significant in the high government bank ownership group, however, has a positive effect on private credit and the financial sector efficiency variables in the low government bank ownership group. Exchange rate controls and inflation influence the financial sector size and efficiency variables negatively.

Robustness Tests

Several tests are carried out to ensure the robustness of the results. The study uses a number of alternative measures of financial development to check the robustness of the results to the measure of financial sector development. Financial sector size is proxied by three different variables: the ratio of deposit banks assets to GDP, liquid assets to GDP and domestic credit by deposit banks and other financial institutions to the private sector as a ratio of GDP. Financial sector efficiency is measured by two variables: the value of banks' net interest margin to total assets, and banks' overhead costs to total assets. The results are robust to the measure of financial sector development.

Several additional control variables are used to check the robustness of the results to the conclusions of the study. These control variables which include, population growth, secondary schooling, government consumption, gross domestic capital

formation, religious fractionalisation and a conflict dummy variable do not change the overall conclusions of the study.

System GMM is used in addition to OLS to ensure that the results are robust to the estimation procedure. The system GMM method allows correcting for the potential endogeneity of migrant remittances and other explanatory variables. It also permits the inclusion of time invariant regressors which would disappear in difference GMM. Two diagnostic tests are carried out on the system GMM estimates, a Sargan test for overidentifying restrictions and the Arellano-Bond test for second order serial correlation in the first-differenced residuals. The Sargan test and the serial correlation test confirm that the moments conditions cannot be rejected.

The sample is further disaggregated by the government ownership of banks to confirm the finding that remittances have a stronger influence on financial sector size in countries with a lower government ownership of banks and a stronger impact on financial sector efficiency in countries with a higher government ownership of banks. The disaggregated models confirm the findings derived in Table 6.

6. Conclusions

This study examines the impact of migrant remittances on financial sector size and efficiency. The study also investigates the effect of remittances on financial sector size and efficiency through the government ownership of banks channel. The results suggest that remittances lead to increases in the volume of credit disbursed, the volume of bank deposits and liquid assets in the banking sector consistent with the findings of Aggarwal *et al*.(2006), Giuliano and Ruiz-Arranz (2009), Gupta *et al.* (2009). The results also suggest that remittances lead to a fall in overhead costs and net interest margins. The conclusion that remittances lead to an increases in deposits mobilised, credit disbursed and liquid assets is reasonable considering that remittances serve as an important means of providing financial access particularly to the rural poor. Remittances provide a means through which recipients can open accounts thereby improving the liquidity of the banking system and the availability of credit the public. The results also suggest that remittances permit banks to reduce overhead costs and net interest margins. In many low and middle income economies, the banking system subsidies loans providing the public with access to funds (see Detragiache et al. 2005). It is possible that remittance inflows permit banks to further subsidise loans and thereby have the potential to reduce overhead costs. The interaction terms on bank ownership x migrant remittances, and the government bank ownership disaggregated estimates, suggest that remittances lead to increases in the volume of deposits mobilised, credit disbursed and liquid assets in countries with a low government ownership of banks. Although remittances also lead to increases in financial sector size in countries with a high government ownership of banks, greater increases in financial sector size are experienced by the low government ownership group. A possible explanation for this perhaps is that countries with a lower presence of state banks offer higher interest rates on deposits attracting larger volumes of deposits. This in turn enables these banks to increase liquid assets and lending to the private sector. Privately owned banks could also provide customers with a wider range of financial services and instruments compared to government owned banks. The interaction terms and the estimates for the regressions disaggregated by the government ownership of banks also suggest that remittances lead to a fall in

overhead costs and net interest margins in countries with a high government bank ownership. A reason that net interest margins are low in countries with a high government ownership of banks is perhaps due to the subsidization of loans due to lending to priority sectors. It is possible that remittance flows enable these banks to further subsidize lending giving rise to lower net interest margins and therefore overhead costs.

The present study in addition, shows that income is an important factor explaining financial sector development. Evidence also shows that greater openness as measured primarily by the volume of exports to GDP, exchange rate relaxation and to some extent FDI, contribute to financial sector development. This is reasonable considering that increased openness could encourage increased transfers into remittance receiving countries and also increase the use of the formal sector for money transmission purposes. The results indicate that inflation has a negative impact on both financial sector size and efficiency. Inflation can discourage financial intermediation and increase risk thereby reducing remittance flows and financial sector development. There is also some evidence that secondary school enrolment and gross domestic capital formation are important for financial sector development suggesting that the level of financial literacy of a society and investment in infrastructure are important pre-requisites for financial sector development. The results indicate that religious fractionalisation contributes negatively to financial sector development. This is not surprising given that religious heterogeneity can slow down the process of financial development by promoting the interests of certain groups (see Beck *et al*. 2003). The results lend support to the argument that conflict contributes negatively to financial sector size, however, also contribute to reducing overhead costs and net interest margins. The fall in the financial sector size variables are possibly due to the uncertainity and risk associated with conflict. It is also possible that borrowing falls during periods of conflict to which banks respond by reducing net interest margins and overhead costs.

In conclusion, the government ownership of banks is not detrimental to remittance receiving countries. In the developing economies, the government has a wider distribution of branches in rural areas, and it is the government that primarily provides the masses with access to cheap credit. Government ownership plays an important role in the present study by mobilising savings within a financial system. This is consistent with the development view according to which the government can help reduce market failures thereby promoting development through lower costs and increased access to finance. Given the evidence that remittances contribute positively to financial sector development, the governments of these economies should take measures to improve the range of money transmission services provided to migrants through formal channels. This would contribute not only to increasing the size and efficiency of the financial system but also bring a larger proportion of the 'unbanked' population into the 'banked' sector. While measures have been taken by several countries to introduce financial literacy programmes and improve the infrastructure necessary for the provision of financial services, it is important to ensure that these programmes are targeted to the masses increasing financial inclusiveness. Bank penetration needs to be increased by setting up more banks and/or increasing services such as access to branchless banking, for example mobile phone payment systems, targeting the unbanked.

References

Abdih Y, Chami R, Dagher J and Montiel P (2008) "Remittances and Institutions: Are Remittances a Curse?" IMF Working Paper, 29/2008.

Acemoglu D, Johnson S, Robinson J and Yared P (2008) 'Income and Democracy,' *American Economic Review*, 91, 808-842.

Acosta p, Baerg R and Mandelman F (2009) "Financial Development, Remittances and Real Exchange Rate Appreciation" Federal Reserve Bank of Atlanta Economic Review, 94, 1-12.

Adams R and Page J (2003) "International Migration, Remittances and Poverty in Developing Countries, World Bank Policy Research Paper 3179, Washington.

Aggarwal R, Demirguc-Kunt A and Martinez-Peria M (2006) "Do Workers' Remittances Promote Financial Development?" World Bank Policy Research Working Paper 3957, Washington.

Alberola E and Salvado R (2006) "Banks, Remittances and Financial Deepening in Receiving Countries: A Model" Documentors de Trabajo No, 0621, Banco de Espana.

Alesina A, Devleeschauwer A, Easterly W, Kurlat S and Wacziarg R (2003) "Fractionalization," *Journal of Economic Growth*, 8, 155-194.

Arellano M and Bover O (1995). "Another Look at the Instrumental Variables Estimation of Error Components Models" Journal of Econometrics, 68, 29-51.

Barjas A, Chami R, Fullenkamp C, Gapen M and Montiel P (2009) "Do Workers' Remittances Promote Economic Growth?" IMF Working Paper 153/2009.

Barth J, Caprio G Jr. and Levine R (2001) 'The Regulation and Supervision of Banks Around the World: A New Database" World Bank Policy Research Paper 2588, World Bank.

Beck T, Demirguc-Kunt A and Levine R (2003) "Law, Endowments and Finance," Journal of Financial Economics, 70, 137-181.

Beck T, Demirgüc-Kunt A and Levine R (1999) "A New Database on Financial Development and Structure," *World Bank Policy Research Working Paper* 2146, World Bank, Washington (updated in 2009).

Blundell R and Bond S (1998) "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models," Journal of Econometrics, 87, 115-143.

Bond S, Hoeffler A and Temple J (2001) "GMM Estimation of Empirical Growth Models," Economics Group, Nuffield College, University of Oxford Working Paper 21.

Chami R, Hakura D and Montiel P (2009) "Remittances: An Automatic Output Stabilizer? " IMF Working Papers: 91/2009.

Ciment J (2006) Ed. Encyclopedia of Conflicts Since World War II: Second Edition, M E Sharpe.

Chin M and Ito H (2002) "Capital Account Liberalization, Institutions and Financial Development: Cross Country Evidence" NBER Working Paper 8967.

Detragiache E, Gupta P and Tressel T (2005) 'Finance in Lower-Income Countries: An Empirical Exploration,' IMF Working Paper, 167.

Durbin J (1954) "Errors in Variables," *Review of the International Statistical Institute*, 22, 23-32

East African (2009) 'Businesses Still Prefer Cash or Cheques' November 16, 2009 Monday.

Fischer S (2001) "Exchange Rate Regimes: Is the Bipolar View Correct" Journal of Economic Perspectives, 15, 3-24.

Freund C and Spatafora N (2005) "Remittances: Transactions Costs, Determinants, and Informal Flows" World Bank Policy Research Paper No, 3704.

Giuliano P and Ruiz-Arranz M (2009) "Remittances, Financial Development and Growth," Journal of Development Economics, 90, 144-152.

Gupta S, Pattillo A and Wagh S (2009) "Effect of Remittances on Poverty and Financial Development in Sub-Saharan Africa," World Development, 37, 104-115.

Hansen, L. Heaton, J. and Yaron, A. (1996), 'Finite Sample Properties of Some Alternative GMM Estimators', *Journal of Business and Economic Statistics*, 14, 262 – 280.

Harper J and McNulty J (2008) "Financial System Size in Transition Economies: The Effect of Legal Origin," *Journal of Money, Credit and Banking*, 40, 1263-1280.

Hausman J (1978) 'Specification Tests in Econometrics' *Econometrica*, 46, 1251.

IMF (2005) World Economic Outlook: Globalization and External Imbalances, Washington.

Kaufmann, D, Kraay, A and Mastruzzi, M. 2006. "Governance Matters V: Governance Indicators for 1996-2005." World Bank Policy Research Working Paper 4012.

La Porta R, Lopez-de-Silanes F, Shleifer A (2002) "Government Ownership of Banks," *Journal of Finance,* 57, 265–301.

La Porta R., Lopez-de-Silanes F, Shleifer A and Vishny R. (1999) "The Quality of Government," *Journal of Law, Economics and Organization*, 15, 222-279.

La Porta R., Lopez-de-Silanes F and Shleifer, A. (1997) "Legal Determinants of External Finance," *Journal of Finance*, LII, 1131- 1150.

Lopez H, Molina L and Bussolo M (2007) "Remittances and the Real Exchange Rate" World Bank Policy Research Paper 4213.

Mohapatra N (2009) "Micro remittance from Mumbai to Apnagaon" Inclusion: Mainstreaming the Marginalised, S<OCH Summit, Saluting Best Practices, 2010.

Mundaca B. G (2009) "Remittances, Financial Market Development, and Economic Growth: The Case of Latin America and the Caribbean," Review of Development Economics, 13, 288-2009.

Daily the Pak Banker (2009) 'Tameer Bank, Telenor launch `Money Transfer' service' November 20, 2009 Friday, Islamabad.

Orozco M and Fedewa R (2005) "Leveraging Efforts on Remittances and Financial Intermediation" Report Commissioned by the Inter-American Development Bank.

Rajan R and Subramanian A (2005) "What Undermines Aid's Impact on Growth?" NBER Working Paper, 11657.

Roodman D (2007) "PRACTIONERS' CORNER: A Note on the Theme of Too Many Instruments," Oxford Bulletin of Economics and Statistics, 71, 135-158.

Roodman D (2006) "An Introduction to "Difference" and "System" GMM in Stata" Centre for Global Development, Working Paper No. 103.

Shea J (1997) "Instrument Relevance in Multivariate Linear Models: A Simple Measure," *Review of Economics and Statistics*, 79, 348 – 352.

Shortland A (2009) "A Case for Nationalising Failing Banks" Development and Transition, 13, 9-10.

Stutz R and Williamson R (2003) "Culture, Openness and Finance," Journal of Financial Economics, 70, 313-349.

Woodruff C and Zenteno R (2007) "Migration Networks and Microenterprises in Mexico," Journal of Development Economics, 82, 509-528.

World Bank (2009) "Trade in Financial Services: Mobile Phone Banking in Southern Africa" Consolidated Draft Report.
World Bank (2009)
siteresources.**worldbank**.org/.../**Remittances**Data_July09(Public).xls
World Bank: Global Development Finance, Various Issues.
Wu, D. 1973. "Alternative Tests of Independence between Stochastic Regressors and Disturbances." *Econometrica*, 41, 733 – 750.
Yang D and Choi H (2007) "Are Remittances Insurance? Evidence from Rainfall Shocks in the Philippines," *World Bank Economic Review*, 21, 219-248.

Appendix

Data Sources and Description:

- Ratio of Deposit Bank Assets/GDP, Domestic Credit by Deposit Banks and Other Financial Institutions/GDP, Liquid Assets/GDP, Banks Net Interest Margin/Total Assets, Banks' Overhead Costs/Total Assets, Migrant Remittances % of GDP, annual data 1990-2007: from Beck, Demirguc-Kunt and Levine (1999 updated in 2009) and World Development Indicators.
- GDP per capita annual data 1990-2007: Purchasing Power Parity from the World Development Indicators.
- Migrant Remittances and Compensation of Employees Absolute Value US $ Million annual data 1990-2007– Current transfers by migrant workers, wages and salaries earned by non resident workers from Global Development Finance.
- Foreign Direct Investment annual data 1990-2007: World Development Indicators.
- Exports as % of GDP annual data 1990-2007: World Development Indicators.
- Exchange Rate Dummy Variable: Takes on a value of 1 if a country follows some form of fixed/managed/crawling peg exchange rate regime and a value of 0 is the currency of a country is allowed to float freely: from Fischer S (2001).
- Inflation (consumer price index) annual data 1990-2007: World Development Indicators.
- Government Consumption/GDP annual data 1990-2007: World Development Indicators.
- Government Ownership of Banks: Share of the top 10 banks in a country owned by the government of that country in 1995 from La Porta, Lopez-De-Silanes and Shleifer (2002); and the fraction of deposits held by the five largest banks from Barth, Caprio and Levine (2001).
- Legal origin from La Porta, Lopez-DeSilanes and Shleifer (1997) and Harper and Mc Nulty (2008). A dummy variable of one is assigned for French legal origin and zero otherwise.
- Gross Domestic Capital Formation/GDP annual data 1990-2007: World Development Indicators.
- Net Secondary Enrolment Ratio annual data 1990-2007: World Development Indicators.
- Conflict Dummy Variable: takes on a value of 1 if a country experienced a conflict during the period under study, and zero otherwise. From the Encyclopedia of Conflicts Since World War II edited by Ciment J (2006).

- Religious fractionalisation 2001: from Alesina A, Devleeschauwer A, Easterly W, Kurlat S and Wacziarg R (2003).
- Population growth rate annual data 1990-2007: World Development Indicators.

Countries in the Sample

Albania, Algeria, Argentina, Armenia, Azerbaijan, Bangladesh, Belarus, Benin, Bolivia, Botswana, Brazil, Burundi, Cambodia, Cameroon, Central African Republic, Chad, Chile, China, Cambodia, Comoros, Congo, Costa Rica, Cote d'Ivoire, Cuba, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Ethiopia, Fiji, Georgia, Ghana, Guatemala, Haiti, Honduras, India, Indonesia, Iran, Jamaica, Jordan, Kazakhstan, Kenya, Lao, Latvia, Lebanon, Lesotho, Liberia, Libya, Lithuania, Madagascar, Malawi, Maldives, Mauritania, Mauritius, Mexico, Mongolia, Morocco, Mozambique, Myanmar, Namibia, Nepal, Nicaragua, Niger, Nigeria, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Romania, Russia, Samoa, Senegal, Sierra Leone, Solomon Islands, South Africa, Sri Lanka, Sudan, Suriname, Swaziland, Syria, Thailand, Togo, Tonga, Tunisia, Turkey, Uganda, Ukraine, Vanuatu, Venezuela, Viet Nam, Yemen, Zambia, Zimbabwe.

Table 1: The Government Ownership of Banks, Financial Sector Development and Migrant Remittances

Country	Government Ownership of Banks[a]	Deposit Bank Assets/GDP[b]	Liquid Liabilities /GDP[b]	Private Credit /GDP[b]	Overhead Costs[b]	Net Interest Margin[b]	Remittances US $ Million[c]	Remittances/ GDP[c]
China	1.040			1.140	0.011	0.024	7499.750	0.434
Iran	1.000	0.257	0.517	0.300	0.017	0.044	1056.000	0.714
Algeria	0.990	0.320	0.478	0.480	0.016	0.046	1053.000	1.734
Viet Nam	0.990	0.652		0.660	0.013	0.028	4000.000	7.821
Bangladesh	0.950	0.255	0.274	0.165	0.023	0.007	2050.000	4.094
Costa Rica	0.910	0.191	0.375	0.171	0.065	0.052	67.750	0.541
Bulgaria	0.860	0.436			0.037	0.044	547.000	0.466
India	0.850	0.324	0.416	0.268	0.029	0.030	11328.000	2.088
Pakistan	0.850	0.341	0.397	0.234	0.030	0.029	2268.250	3.266
Poland	0.840	0.393	0.418	0.277	0.038	0.043	1499.750	0.918
Maldives	0.750						2.250	0.575
Slovakia	0.740			0.440	0.028	0.023	123.000	0.389
Sri Lanka	0.710	0.258	0.359	0.191	0.047	0.051	1116.000	7.001
Moldova	0.700		0.365	0.208	0.052	0.058	366.667	10.451
Belarus	0.670			0.220	0.048	0.050	179.333	0.852
Burundi	0.630	0.035	0.040	0.200	0.332	0.512	0.000	0.000
Nicaragua	0.630			0.250	0.046	0.047	331.667	5.937
Romania	0.630	0.184	0.297	0.150	0.052	0.053	1209.500	1.711
Venezuela	0.570	0.235	0.448	0.387	0.067	0.078	42.000	0.032
Jamaica	0.560	0.328	0.455	0.280	0.076	0.091	889.250	12.184
Kazakhstan	0.560	0.296	0.241	0.150	0.034	0.046	138.667	0.407
Tajikistan	0.560			0.140			0.000	0.000
Colombia	0.530	0.155	0.265	0.272	0.083	0.064	1566.500	1.759
Lesotho	0.510	0.274	0.442	0.162	0.046	0.035	354.500	28.697
Average High Govt. Bank Ownership (> 50 %)	**0.751**	**0.290**	**0.362**	**0.307**	**0.054**	**0.066**	**1570.368**	**3.836**
Paraguay	0.480	0.121	0.207	0.162	0.064	0.065	216.750	2.931
Lithuania	0.440	0.375	0.360	0.328	0.025	0.026	195.000	0.644
Indonesia	0.430	0.301	0.274	0.262	0.029	0.041	669.000	0.419
Ecuador	0.400	0.152	0.210	0.189	0.077	0.072	1265.667	4.390
Dominican Republic	0.390	0.172	0.225	0.253	0.065	0.063	1427.500	7.861
Ghana	0.380	0.052	0.142	0.032	0.055	0.071	77.000	0.493
Morocco	0.380	0.279	0.542	0.258	0.027	0.036	2681.500	7.475
Tunisia	0.370	0.569	0.478	0.565	0.019	0.022	855.000	4.505
Mexico	0.360	0.192	0.234	0.176	0.050	0.053	9190.750	1.757
Turkey	0.350	0.186	0.218	0.138	0.064	0.094	2996.000	1.645
Brazil	0.320	0.242	0.193	0.247	0.120	0.120	2269.250	0.337
Russian Federation	0.320	0.268	0.297	0.227	0.040	0.040	2298.333	0.390

Country	Government Ownership of Banks[a]	Deposit Bank Assets/GDP[b]	Liquid Liabilities /GDP[b]	Private Credit /GDP[b]	Overhead Costs[b]	Net Interest Margin[b]	Remittances US $ Million[c]	Remittances/ GDP[c]
Zimbabwe	0.300	0.211	0.395	0.219	0.039	0.044	1.000	0.012
Kenya	0.290	0.247	0.404	0.291	0.037	0.073	374.750	3.049
Senegal	0.280	0.327	0.251	0.310	0.067	0.050	289.750	4.819
Philippines	0.270	0.294	0.331	0.294	0.051	0.042	6650.750	7.686
El Salvador	0.260	0.248	0.312	0.236	0.033	0.039	1509.250	13.446
Jordan	0.260	0.656	0.656	0.258	0.027	0.036	1571.250	18.945
Peru	0.260	0.101	0.146	0.098	0.105	0.072	711.000	1.209
Ukraine	0.260			0.330	0.048	0.049	314.000	0.418
Zambia	0.230	0.001	0.010	0.070	0.541	0.420	0.000	0.000
Guatemala	0.220	0.154	0.229	0.151	0.061	0.054	3324.250	13.624
Botswana	0.200	0.123	0.256	0.113	0.055	0.052	74.000	1.332
Nepal	0.200	0.167	0.280	0.111	0.025	0.037	459.667	4.913
Guyana	0.190	0.638	0.837	0.297	0.039	0.044	76.667	10.548
Panama	0.170	0.536	0.442	0.508	0.016	0.020	91.000	1.172
Thailand	0.170	0.575	0.607	0.682	0.020	0.030	1388.000	1.068
Nigeria	0.130	0.188	0.272	0.147	0.078	0.047	1383.750	2.610
Malaysia	0.100	0.678	0.921	0.797	0.016	0.025	825.750	0.959
Vanuatu	0.100	0.450	0.963	0.428			17.000	7.457
Lebanon	0.070	0.440	0.500	0.840	0.017	0.027	2387.250	23.692
Trinidad &Tobago	0.020	0.372	0.512	0.498	0.045	0.037	40.000	0.465
Samoa	0.000	0.380	0.411	0.362			43.333	16.774
South Africa	0.000	0.564	0.455	0.788	0.036	0.039	369.000	0.303
Tonga	0.000	0.578	0.514	0.536			45.000	33.268
Average Low Govt. Bank Ownership (< 50%)	**0.246**	**0.319**	**0.385**	**0.320**	**0.057**	**0.057**	**1316.805**	**5.732**

a- Government ownership of banks from La Porta, Lopez-De-Silanes and Shleifer (2002) and Barth, Caprio Jr and Levine(2001).

b – All financial sector variables and migrant remittances as % of GDP are from Beck, Demirguc-Kunt and Levine (1999 updated in 2009) and World Development Indicators.

c - Data on remittances absolute value in US $ million from Global Development Finance, World Bank.

Table 2: Migrant Remittances and Financial Sector Size and Efficiency: OLS Estimation

	(1)	(2)	(3)	(4)	(5)
Independent Variables	Deposit Money Bank Assets/ GDP	Private Credit/GDP	Liquid Assets/GDP	Overhead Costs	Net Interest Margin
Log GDP Per Capita	0.033	0.048	0.072	-0.003	-0.005
	(0.080)***	(0.010)***	(0.018)***	(0.001)**	(0.001)***
Remittances	0.039	0.025	0.024	- 0.003	-0.004
	(0.003)***	(0.003)*	(0.005)***	(0.0005)***	(0.0006)***
Exports	0.136	0.144	0.141	-0.009	-0.015
	(0.019)***	(0.019)***	(0.017)***	(0.002)***	(0.002)***
FDI	0.005	0.010	0.011	-0.004	- 0.003
	(0.004)	(0.005)*	(0.004)**	(0.0007)***	(0.0008)***
Inflation	-0.059	-0.054	-0.070	0.011	0.014
	(0.006)***	(0.007)***	(0.007)***	(0.0008)***	(0.001)***
Exchange Rate	- 0.035	-0.007	- 0.063	0.004	0.006
Regime Dummy	(0.018)***	(0.034)	(0.018)***	(0.003)	(0.003)*
Intercept	0.516	0.615	0.056	0.060	0.075
	(0.075)***	(0.076)***	(0.154)	(0.011)***	(0.012)***
R^2	0.36	0.28	0.30	0.29	0.39
Observations	831	830	832	719	711

Note: Robust standard errors clustered by region reported in parenthesis. ***, **, *, significant at the 1%, 5% and 10% levels respectively.

Table 3: Migrant Remittances and Financial Sector Size and Efficiency with Additional Control Variables: OLS Estimation

	(1)	(2)	(3)	(4)	(5)
Independent Variables	Deposit Money Bank Assets/ GDP	Private Credit/GDP	Liquid Assets/GDP	Overhead Costs	Net Interest Margin
Log GDP Per Capita	0.048	0.083	0.060	-0.008	-0.018
	(0.010)***	(0.036)***	(0.029)**	(0.003)***	(0.003)***
Remittances	0.041	0.028	0.021	-0.003	-0.003
	(0.008)***	(0.008)***	(0.007)***	(0.001)**	(0.001)**
French Legal Origin Dummy	-0.012	-0.060	-0.042	0.023	0.030
	(0.039)	(0.037)*	(0.044)	(0.004)***	(0.004)***
Exports	0.144	0.163	0.166	-0.009	-0.017
	(0.030)***	(0.028)***	(0.025)***	(0.002)***	(0.003)***
FDI	0.019	0.002	0.030	0.002	-0.002
	(0.014)	(0.016)	(0.016)*	(0.008)	(0.002)
Exchange Rate Dummy	-0.084	-0.030	-0.159	0.018	0.017
	(0.038)**	(0.052)**	(0.045)***	(0.005)***	(0.006)***
Inflation	-0.084	-0.088	-0.102	0.009	0.012
	(0.012)***	(0.013)***	(0.014)***	(0.001)***	(0.002)***
Population growth	0.103	0.128	0.089	-0.001	0.007
	(0.034)***	(0.041)***	(0.038)**	(0.002)	(0.003)*
Secondary Schooling	0.095	0.051	0.128	-0.014	-0.011
	(0.030)***	(0.030)*	(0.003)***	(0.004)***	(0.003)***
Govt. Consumption	0.009	-0.018	0.068	0.008	0.005
	(0.039)	(0.036)	(0.040)*	(0.004)**	(0.004)
Gross Domestic Capital Formation	0.067	0.094	0.043	-0.020	0.004
	(0.052)	(0.059)	(0.057)	(0.006)***	(0.009)
Religious Fractionalisation	-0.221	-0.229	-0.097	0.012	0.047
	(0.084)***	(0.105)**	(0.081)	(0.008)	(0.010)***
Conflict Dummy	-0.084	0.042	-0.071	-0.006	-0.006
	(0.026)***	(0.031)	(0.026)***	(0.003)*	(0.003)*
Intercept	0.008	0.531	0.706	0.248	0.114
	(0.642)	(0.546)	(0.722)	(0.019)***	(0.087)
R^2	0.53	0.51	0.52	0.48	0.46
Observations	252	252	252	246	245

Note: Robust standard errors clustered by region reported in parenthesis. ***, **, *, significant at the 1%, 5% and 10% levels respectively.

Table 4: Migrant Remittances and Financial Sector Size and Efficiency: System GMM Estimation

	(1)	(2)	(3)	(4)	(5)
Independent Variables	Deposit Money Bank Assets/ GDP	Private Credit/GDP	Liquid Assets/GDP	Overhead Costs	Net Interest Margin
Log GDP Per Capita	0.124 (0.037)***	0.125 (0.011)***	0.043 (0.009)***	-0.001 (0.003)	-0.013 (0.009)***
Remittances	0.008 (0.002)***	0.004 (0.002)**	0.010 (0.002)***	-0.002 (0.001)**	-0.004 (0.001)***
Exports	0.090 (0.040)**	0.069 (0.010)***	0.034 (0.009)***	-0.006 (0.004)	-0.013 (0.004)***
FDI	0.001 (0.003)	0.003 (0.001)***	0.001 (0.001)	-0.001 (0.0001)*	-0.001 (0.001)
Exchange Rate Dummy	-0.107 (0.039)***	-0.065 (0.040)*	-0.002 (0.031)	0.048 (0.017)***	0.022 (0.028)
Inflation	-0.010 (0.001)***	-0.011 (0.001)***	-0.003 (0.001)*	0.001 (0.0008)*	0.003 (0.0009)***
Lag of Dependent Variable	0.947 (0.030)***	0.974 (0.011)***	0.976 (0.021)***	0.526 (0.034)***	0.394 (0.038)***
Intercept	0.842 (0.294)***	0.835 (0.099)***	0.282 (0.074)***	0.023 (0.029)	-0.415 (0.219)**
Sargan Test for over-identifying restriction: p value	0.14	0.15	0.15	0.16	0.16
2nd Order Autocorrelation: p value	0.13	0.13	0.14	0.14	0.15
Observations	782	781	784	669	660

Note: Standard errors reported in parenthesis. ***, **, *, significant at the 1%, 5% and 10% levels respectively. The difference equation is instrumented with the lagged levels, two periods, of the dependent variable and the levels equation with the difference lagged one period. Time specific fixed effects are included as regressors.

Table 5: Migrant Remittances and Financial Sector Size and Efficiency with Additional Control Variables: System GMM

	(1)	(2)	(3)	(4)	(5)
Independent Variables	Deposit Money Bank Assets/ GDP	Private Credit/GDP	Liquid Assets/GDP	Overhead Costs	Net Interest Margin
Log GDP Per Capita	0.024 (0.014)*	0.026 (0.018)*	0.045 (0.016)***	-0.006 (0.001)***	-0.007 (0.004)*
Remittances	0.023 (0.010)**	0.021 (0.008)***	0.019 (0.005)***	-0.003 (0.001)**	-0.009 (0.003)***
French Legal Origin Dummy	-0.068 (0.038)*	-0.122 (0.055)**	-0.011 (0.035)	0.131 (0.025)***	0.045 (0.076)
Exports	0.117 (0.046)***	0.039 (0.020)**	0.026 (0.014)*	-0.005 (0.008)	-0.008 (0.010)
FDI	0.010 (0.008)	0.002 (0.003)	0.009 (0.003)***	0.001 (0.001)	-0.002 (0.001)**
Exchange Rate Dummy	-0.457 (0.095)**	-0.239 (0.045)***	-0.081 (0.045)*	0.040 (0.032)	0.017 (0.060)
Inflation	-0.025 (0.008)***	-0.009 (0.003)**	-0.005 (0.003)	0.001 (0.001)	0.003 (0.001)*
Population growth	0.019 (0.013)	0.005 (0.006)	0.002 (0.006)	-0.002 (0.003)	0.003 (0.003)
Secondary Schooling	0.051 (0.022)**	0.007 (0.023)	0.021 (0.012)*	-0.009 (0.004)**	-0.013 (0.011)
Govt. Consumption	0.050 (0.056)	-0.002 (0.027)	0.001 (0.021)	0.014 (0.013)	0.010 (0.012)
Gross Domestic Capital Formation	0.168 (0.047)***	0.045 (0.022)**	0.019 (0.019)	-0.029 (0.010)***	-0.009 (0.016)
Religious Fractionalisation	-0.165 (0.242)	-0.011 (0.176)	-0.311 (0.096)***	0.089 (0.033)***	0.110 (0.146)
Conflict Dummy	-0.183 (0.075)***	0.019 (0.013)	-0.001 (0.035)	-0.004 (0.015)	-0.031 (0.015)*
Lag of Dependent Variable	0.877 (0.040)***	0.781 (0.043)***	0.894 (0.042)***	0.214 (0.068)***	0.229 (0.125)*
Intercept	0.875 (0.505)*	0.225 (0.206)	0.440 (0.146)***	0.010 (0.078)	0.106 (0.187)
Sargan Test for over-identifying restriction: p value	0.15	0.14	0.15	0.13	0.16
Arellano-Bond Test for 2nd Order Autocorrelation: p value	0.21	0.22	0.75	0.58	0.15
Observations	252	252	252	246	240

Note: Standard errors reported in parenthesis. ***, **, *, significant at the 1%, 5% and 10% levels respectively. The difference equation is instrumented with the lagged levels, two periods, of the dependent variable and the levels equation with the difference lagged one period. Time specific fixed effects are included as regressors.

Table 6: Bank Ownership, Migrant Remittances and Financial Sector Development: System GMM

	(1)	(2)	(3)	(4)	(5)
Independent Variables	Deposit Money Bank Assets/ GDP	Private Credit/GDP	Liquid Assets/GDP	Overhead Costs	Net Interest Margin
Log GDP Per Capita	0.168 (0.065)***	0.250 (0.037)***	0.052 (0.028)*	-0.004 (0.003)	-0.008 (0.016)
Remittances	0.036 (0.010)***	0.024 (0.010)***	0.019 (0.010)*	-0.002 (0.001)*	-0.006 (0.002)**
Exports	0.208 (0.053)***	0.151 (0.039)***	0.102 (0.040)***	-0.004 (0.005)	-0.010 (0.005)*
FDI	0.004 (0.007)	0.029 (0.009)***	0.001 (0.005)	-0.001 (0.001)	-0.002 (0.0008)***
Exchange Rate Dummy	-0.447 (0.191)**	-0.373 (0.097)***	-0.522 (0.368)	0.030 (0.02)	0.019 (0.027)
Inflation	-0.007 (0.013)	-0.018 (0.008)***	-0.007 (0.007)	0.002 (0.001)*	0.003 (0.001)**
Government Ownership* Remittances	-0.003 (0.0009)***	-0.002 (0.001)*	-0.001 (0.001)	-0.005 (0.003)*	-0.019 (0.010)*
Intercept	0.222 0.620)	0.367 (0.312)	1.83 (0.923)	0.032 (0.049)	0.016 (0.110)
Lag of Dependent Variable	0.997 (0.055)***	0.845 (0.026)***	0.933 (0.035)***	0.523 (0.098)***	0.389 (0.075)***
Sargan Test for over-identifying restriction: p value	0.12	0.16	0.17	0.15	0.14
Arellano-Bond Test for 2nd Order Autocorrelation: p value	0.14	0.13	0.15	0.14	0.14
Observations	611	608	614	563	559

Note: Standard errors reported in parenthesis. ***, **, *, significant at the 1%, 5% and 10% levels respectively. The difference equation is instrumented with the lagged levels, two periods, of the dependent variable and the levels equation with the difference lagged one period. Time specific fixed effects are included as regressors.

Table 7: Bank Ownership, Migrant Remittances and Financial Sector Development Disaggregated by Government Ownership of Banks: System GMM

	(1)	(2)	(3)	(4)	(5)
High Government Bank Ownership Group					
Independent Variables	Deposit Money Bank Assets/ GDP	Private Credit/GDP	Liquid Assets/GDP	Overhead Costs	Net Interest Margin
Log GDP Per Capita	0.150 (0.040)***	0.206 (0.028)***	0.059 (0.029)**	-0.001 (0.003)	-0.003 (0.005)
Remittances	0.015 (0.008)*	0.020 (0.008)***	0.006 (0.006)	-0.003 (0.001)***	-0.004 (0.001)***
Exports	0.194 (0.032)***	0.154 (0.029)***	0.108 (0.024)***	-0.007 (0.005)	-0.017 (0.006)***
FDI	0.004 (0.006)	0.005 (0.006)	0.002 (0.005)	-0.001 (0.001)	-0.001 (0.0001)
Exchange Rate Dummy	-0.401 (0.087)***	-0.333 (0.078)***	-0.031 (0.098)	0.029 (0.019)	0.001 (0.015)
Inflation	-0.007 (0.006)	-0.007 (0.006)	-0.010 (0.004)**	0.001 (0.001)	0.006 (0.001)***
Lag of Dependent Variable	0.882 (0.030)***	0.860 (0.028)***	0.853 (0.031)***	0.306 (0.054)***	0.457 (0.053)***
Intercept	0.709 (0.326)**	0.845 (0.026)***	0.222 (0.259)	0.063 (0.031)**	0.074 (0.035)**
Sargan Test for over-identifying restriction: p value	0.15	0.16	0.18	0.13	0.12
Arellano-Bond Test for 2nd Order Autocorrelation: p value	0.14	0.013	0.15	0.18	0.20
Observations	400	403	403	356	352
Low Government Bank Ownership Group					
	Deposit Money Bank Assets/ GDP	Private Credit/GDP	Liquid Assets/GDP	Overhead Costs	Net Interest Margin
Log GDP Per Capita	0.113 (0.024)***	0.044 (0.033)	0.097 (0.024)***	-0.015 (0.006)**	-0.002 (0.005)
Remittances	0.032 (0.008)***	0.048 (0.011)***	0.017 (0.006)***	-0.001 (0.001)	-0.001 (0.001)
Exports	0.082 (0.035)***	0.095 (0.044)**	0.062 (0.025)***	-0.004 (0.003)	-0.014 (0.005)***
FDI	0.002 (0.006)	0.037 (0.005)***	0.003 (0.005)	-0.002 (0.001)*	-0.002 (0.001)**
Exchange Rate Dummy	-0.114 (0.083)	-0.564 (0.154)***	-0.280 (0.070)***	0.012 (0.011)	0.005 (0.015)
Inflation	-0.027 (0.007)***	-0.035 (0.009)***	-0.003 (0.005)	0.003 (0.001)***	0.002 (0.001)***
Lag of Dependent Variable	0.951 (0.027)***	0.967 (0.029)***	0.897 (0.030)***	0.614 (0.034)***	0.399 (0.043)***
Intercept	0.406 (0.324)	0.175 (0.368)	0.546 (0.181)***	0.125 (0.050)***	0.120 (0.046)***
Sargan Test for over-identifying restriction: p value	0.16	0.17	0.16	0.12	0.13
Arellano-Bond Test for 2nd Order Autocorrelation: p value	0.17	0.13	0.14	0.13	0.15
Observations	382	378	381	313	308

Note: Standard errors reported in parenthesis. ***, **, *, significant at the 1%, 5% and 10% levels respectively. The difference equation is instrumented with the lagged levels, two periods, of the dependent variable and the levels equation with the difference lagged one period. Time specific fixed effects are included as regressors.