African development finance journal http://journals.uonbi.ac.ke/index.php/adfj
November Vol1 No.2, 2017 PP 82-101 ISSN 2522-3186

Effect of Remittances from Diaspora on Financial Sector Deepening in the East African Community

By: Eric Kinyanjui[1] and Duncan Elly Ochieng (PhD, CIFA)[2]

Abstract

Purpose – This paper investigated the effect of diaspora remittances on financial sector deepening in the East African Community. Personal diaspora remittances were used as a measure of remittances from diaspora. The three proxies for financial deepening that were employed in the study were domestic credit as a ratio of GDP, total credit provided by the financial sector as a percentage of GDP and degree of monetization, M_2 as a percentage of GDP.

Methodology – The study adopted an explanatory research design. It employed panel data analysis - fixed effects method, to model the linear regression equation. The population of the study was the five East African Community member countries and covered a 20-year period (1997 to 2016). The data for this study was obtained from the World Bank statistics website.

Findings – This study established that there exists a positive relationship between remittances from diaspora and financial sector deepening in the EAC but this relationship is not significant. The three models analyzed in this study, show that a 0.31, 0.08 and 0.28 change respectively, in remittances in the respective models, leads to a unit change in the level of financial sector deepening in the EAC.

Implications – The results of this study show that an increase in the level of remittances leads to increased financial deepening in the EAC economies. There is therefore need for the government in liaison with the private sector, to provide a conducive environment for development of financially innovative products that ease and reduce the cost of sending remittances as this will foster further financial deepening, which has the positive effect of financial inclusion, access to credit and economic growth.

Value – This study recommended the fostering of activities that are geared towards the ease of sending remittances and cost reduction of sending the remittances through employment of new financial technologies. Further studies have also been recommended to increase the frontiers of the study especially on developed countries in order to gain more conclusive understanding and generalizability of the remittances-financial sector deepening nexus.

Key Words; *Diaspora remittances, Financial sector deepening, East Africa Community*

[1] MSc Finance Student at the University of Nairobi, School of Business (erickinyanjui8927@gmail.com)

[2] Lecturer University of Nairobi, School of Business, Department of Finance and Accounting and a Certified Investment and Financial Analyst (CIFA) (duncan.elly@uonbi.ac.ke)

Introduction

Diaspora remittances, have over the past few years become an important part of external development finance in developing countries and have by and large increased in absolute volume in comparison to other sources of external financing and provide a relatively stable source of external financing (Kapur, 2003). Aggarwal et al. (2010) and Nyamongo et al. (2012), document the positive effect of remittances on financial sector deepening. Through empirical studies carried out on developing countries, they conceptualize that remittances aid in the financial deepening of an economy. This is through the demand that is created for more financial products that allow the recipients of the remittances who have excess funds not used for consumption, to increase their propensity to save thus allowing the individuals to gain access to financial services and products and thus leading to development and deepening of the financial sector.

Remittances from diaspora to the East African Community countries, have grown in part aided by, the increase in international money remittances service providers and the reduction in the cost of money transfer. There have been various initiatives or products among the three East African countries that have increased financial deepening. Among the initiatives in the East African region includes the East African Payment System (EAPS), the standardization of financial rules and regulations, mutual acceptance of mandate of supervisory agencies and integration of the member country's financial market structure. These are aimed at fostering an environment that will lead to the creation and subsequent provision of financial products to more people in a more efficient manner (World Bank, 2016).

The theory to which we refer to in this study, postulates that through channeling of diaspora remittances through formal financial institutions, the financial institutions will be able to offer financial products and services to an increased populace. We also allude to theories developed by Lucas & Stark (1985) that explain the motivation of migrant workers to remit money back to their home countries. These theories are; the pure altruist theory, which postulates that a remitter would remit money back home to increase the utility of the family back home as this maximizes his/her utility, the pure self-interest theory which postulates that a remitter would send money back home so as to benefit at a personal level from the same and the tempered altruism theory, which

postulates that a remitter would send money back home due to a mutual co-dependent relationship with the family back home and this is to the benefit of all parties involved.

Financial sector deepening occurs when the financial sector players develop products that provide services that increase the flow of information between parties to a transaction and also reduce the transactional costs and thus enable provision of more bespoke financial products and services. It refers to the provision of a wide array of financial products and services that are tailor-made and aimed at all the different levels of society (Shaw, 1974). Financial deepening has been measured using various proxies including; domestic credit as a ratio of GDP, total credit provided by the financial sector as a percentage of GDP and degree of monetization, M_2 as a percentage of GDP. Aggarwal et al. (2011); King & Levine (1993); Oke et al. (2011) use these proxies as a measure of financial sector deepening of a country.

Diaspora remittance can be defined as money sent by a person in a foreign land to his or her home country. Mohamoud and Fréchaut (2006) defines diaspora remittances as the practices, ideas, values and attitudes, mindsets, world views and social capital the diaspora transfers from host communities to home communities. Diaspora remittances are difficult to reliably measure. This is due to the fact that a great chunk of remittances is transmitted through informal channels which makes quantification of the same difficult as they are not captured reliably. Most analysts opt to use official balance of payments or central bank data on remittances.

There have been studies that have delved into the relationship that exists between diaspora remittances and financial deepening. Aggarawal et al. (2010) in an empirical study of the relationship that exists between the two variables, concluded that evidence points to the existence of a significant association between remittances and financial sector development. Mundaca (2009) who in his study stated that there exists a complementarity between diaspora remittances and financial sector deepening. Oke et al. (2011) also concluded in their study that remittances from diaspora have a positive and significant influence on financial deepening in the Nigerian economy. Kumar (2011) concluded that there exists no linkage between workers diaspora remittances and financial development in the long run whilst an inverse relationship exists between the two in the short run. Also in support of this contrary position Brown et al. (2011) stated that there exists an inverse relationship between diaspora remittances and financial sector deepening.

Thus, in literature on the relationship between diaspora remittances and financial deepening, there arises two conflicting stands on the relationship between the two variables.

Regionally, the relationship between the remittances and financial development has been shown by Nyamongo et al. (2012) who found complementary effects of remittances and financial development. A study by Gupta et al. (2009) set out to investigate the nexus between financial development and remittances in sub Saharan Africa, their conclusion was that remittances promote financial development in an economy.

At the local level, Cherono (2013) in a study of the two variables in Kenya, concluded that diaspora remittances have a positive and significant impact on private investment in Kenya. In addition, the coefficient on the regression between financial sector deepening and remittances is positive and statistically significant, thus, a complementary relationship between remittances and financial sector deepening exists. Rubyutsa (2012) in a study in Rwanda that covered a period of 4 years (2006-2009), noted that remittances from diaspora have a positive effect on the economic growth and also the level of financial deepening in Rwanda.

Research Objective

This study sought to investigate the effect of diaspora remittances on financial sector deepening in the East African Community.

Methodology

This study employed the use of the explanatory research design. It enables a meaningful way of data collection and presentation for easy interpretation. The population for this study comprises of the Eastern Africa Community member countries that includes; Burundi, Kenya, Rwanda, Tanzania and Uganda. This study used annual secondary data for 20 years from 1997 to 2016. This data was sourced from the World Bank statistics. It is from these statistics that our study variables, Foreign Direct Investments (FDI), per capita GDP growth, personal diaspora remittances, inflation and trade openness, were obtained.

The data analysis model that was employed in the analysis of the data in this study is the panel data regression technique whereby analysis was done on the various variables that explain the level of financial deepening in the member countries over the 20-year period. The panel estimation

model that we used was the fixed effects models that was determined by the Hausman's specification test to be the superior method.

Analytical Model

The model that was used in this study to determine the effect of remittances from diaspora on financial sector deepening in the EAC was be specified as:

$$\mathbf{FSD_i} = \boldsymbol{\alpha} + \boldsymbol{\beta_1}\mathbf{FDI} + \boldsymbol{\beta_2}\mathbf{GDP} + \boldsymbol{\beta_3}\mathbf{INF} + \boldsymbol{\beta_4}\mathbf{WR} + \boldsymbol{\beta_5}\mathbf{TO} + \boldsymbol{\beta_6}\,\mathbf{WR_{t-1}} + \boldsymbol{\varepsilon}$$

Where;

FSD$_i$ = Financial Sector Deepening

$\boldsymbol{\alpha}$ = constant

$\boldsymbol{\beta_1, \beta_2, \beta_3, \ldots, \ldots, \ldots, \ldots, \ldots, \beta_6}$ = Regression coefficients

FDI = Foreign Direct Investment as a percentage of GDP

GDP = Per capita GDP growth

INF = Inflation

WR = Diaspora remittance as a percentage of GDP

TO = Trade openness as a percentage of GDP

$\mathbf{WR_{t-1}}$ = Diaspora remittance as a percentage of GDP lagged one-time period

$\boldsymbol{\varepsilon}$ = error (or residual)

Results and Discussions

This section presents the analysis and findings of the study as set out in the research objective and research methodology. The general objective of the study was to determine the effect of remittances from diaspora on financial sector deepening in the EAC for the period 1997 to 2016.

Descriptive Statistics

Table 4.1 below presents the summary statistics on annual averages for the period 1997-2016, the table summarizes the number of observations, the mean, median, standard deviation, minimum and maximum for both the dependent and independent variables of the model.

Table 1: Descriptive Statistics

Variable	Obs.	Mean	Skewness	Kurtosis	S.D.	Min	Max
FSD_1	100	15.4716	0.6839	2.8386	7.3462	3.54535	34.3752
FSD_2	100	20.0500	0.6992	2.2499	11.3748	5.4924	45.3824
FSD_3	100	23.8851	1.05666	2.9279	7.9963	13.7935	43.2472
FDI	100	2.0207	0.5484	2.0933	1.8662	-0.0013	6.4798
GDP	100	5.4436	-0.3364	3.8524	3.0497	-3.9049	13.8498
INF	100	8.2416	1.4477	6.341	5.558	-2.4059	31.1116
WR	100	2.5691	0.7581	3.0691	1.6028	0.0009	7.1510
TO	100	42.9646	-0.2166	2.4861	9.5283	20.964	64.4789
WR_{t-1}	100	2.6018	0.8212	3.1403	1.613	0.0009	7.1510

The variable FSD_1 has 100 observations in this panel. The mean is 15.4716% with a standard deviation of 7.3462 % which translates to having a dispersion from 22.8178% to 8.1254%. The smallest value is 3.54535% whilst the largest value is 34.3752% of the variable in this panel. The variable FSD_2 has 100 observations in this panel. The mean is 20.0500% with a standard deviation of 11.3748% which translates to having a dispersion from 31.4247% to 8.6751%. The smallest value is 5.4924% whilst the largest value is 45.3824% of the variable in this panel. The final proxy of financial sector deepening, FSD_3 has 100 observations in this panel. The mean is 23.8850% with a standard deviation of 7.9963% which translates to having a dispersion from 31.8813% to 15.8887%. The smallest value is 13.7934% whilst the largest value is 43.2472% of the variable in this panel.

The Independent variable FDI, has 100 observations in this panel. The mean is 2.0206% with a huge standard deviation of 1.8662% which translates to having a dispersion from 3.8868% to 0.1544%. The smallest value is -0.0013% whilst the largest value is 6.4798% of the variable in this panel. The variable GDP has 100 observations in this panel. The mean is 5.4435% with a standard deviation of 3.0497% which translates to having a dispersion from 8.4932% to 2.3938%. The smallest value is -3.9049% whilst the largest value is 13.8497% of the variable in this panel.

The variable INF has 100 observations in this panel. The mean is 8.2416% with a standard deviation of 5.558% which translates to having a dispersion from 13.7996% to 2.6836%. The smallest value is -2.4059% whilst the largest value is 31.1115% of the variable in this panel.

The variable WR has 100 observations in this panel. The mean is 2.5691% with a standard deviation of 1.6028% which translates to having a dispersion from 4.1719% to 0.9663%. The smallest value is 0.0009% whilst the largest value is 7.151o% of the variable in this panel. The variable TO has 100 observations in this panel. The mean is 42.9645% with a standard deviation of 9.5283% which translates to having a dispersion from 52.4928% to 33.4362%. The smallest value is 20.9640% whilst the largest value is 64.4788% of the variable in this panel. The variable WR_{t-1} has 100 observations in this panel. The mean is 2.6018% with a standard deviation of 1.613% which translates to having a dispersion from 4.2148% to 0.9888%. The smallest value is 0.0009% whilst the largest value is 7.1510% of the variable in this panel.

Diagnostic Test Results

This section details the results of the following diagnostic tests: Hausman specification test, Breusch-Pagan Test, Multicollinearity Test and Normality Test.

Hausman specification test

To determine which method is appropriate to use in our instance we employ the use of the Hausman specification test in order to determine the appropriate model between the fixed and random models. We run both models in order to obtain equations which we subsequently subject to the test. We employ the Sigmamore variant of the Hausman test as it is recommended when comparing the two models because the test is less likely to produce a non-positive definite differenced covariance matrix, hence the Chi^2 value is always positive.

From the test, we obtain values of 50.82 for model 1, 57.92 for model 2 and 72.08 for model 3. All the three values are significant at the 1% significance level as their p values are less than 0.01. The null hypothesis of the test is that the two models are similar and yield similar coefficients whilst the alternative hypothesis is that the fixed effects estimation is superior to the random effects model. Since our test results are all significant we reject the null hypothesis and thus opt to use the fixed effects model in our estimation. Table 2 below summarizes the statistical output of this test.

Table 2: Hausman specification test

Hausman, Sigmamore Test		
Model 1	Model 2	Model 3
$chi^2(4) = 50.82$	$chi^2(4) = 57.92$	$chi^2(4) = 72.08$
$Prob > chi^2 = 0.0000$	$Prob > chi^2 = 0.0000$	$Prob > chi^2 = 0.0000$

Breusch-Pagan Test

This test is used to check for heteroscedasticity in linear regression models. Having obtained a p-values greater than 0.05 in all three models we conclude that there exists no heteroscedasticity in our data. The results of this test are summarized in table 3 below.

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity		
Model 1	Model 2	Model 3
$chi^2(6) = 11.15$	$chi^2(6) = 7.02$	$chi^2(6) = 10.11$
$Prob > chi^2 = 0.0838$	$Prob > chi^2 = 0.3189$	$Prob > chi^2 = 0.1202$

Multicollinearity Test

Before running any panel techniques, we checked for multicollinearity of the independent variables with our cut point being a correlation coefficient of 0.6, and significant. This information is obtained from the correlation matrix. The highest and significant coefficient in our data, other than the lag of remittances and remittances, is 0.3514 between inflation and trade openness, this is far below our cutoff point of 0.6 hence we can conclude that there is no multicollinearity between the independent variables thus we can run panel data models by using these variables.

Normality Test

This test is used to check for normality of data and the test that this study employs to achieve this goal is the Skewness/Kurtosis normality test. The test determines that the observations from where our data is obtained, is normally distributed as this is an assumption in linear regressions. The study therefore conducted the joint Skewness-Kurtosis test on the data obtained from the five East African Community countries.

The null hypothesis of this test is that the data is normally distributed whilst the alternative hypothesis is that the data is not normally distributed. From the table, this study notes that the data exhibits normality as the P- values of the data are greater than 0.05 hence we fail to reject the null hypothesis that the data is normally distributed. The results from that test are summarized in the table 4 below.

Table 4: Skewness-Kurtosis Normality test

	Variable	FSD1	FSD2	FSD3	FDI	GDP	INF	WR	TO	WRt-1
KENYA	adj chi2(2)	3.26	0.44	2.7	4.1	1.65	0.32	0.27	5.4	0.32
	Prob>chi2	0.2	0.8	0.26	0.13	0.44	0.85	0.87	0.07	0.85
RWANDA	adj chi2(2)	3.55	2.22	3.84	3.75	1.13	0.21	5.05	5.33	3.92
	Prob>chi2	0.17	0.33	0.15	0.15	0.57	0.9	0.08	0.07	0.14
BURUNDI	adj chi2(2)	0.05	4.85	1.79	3.03	3.65	5.68	7.81	5.46	8.66
	Prob>chi2	0.98	0.09	0.41	0.18	0.16	0.06	0.02	0.07	0.01
TANZANIA	adj chi2(2)	4.36	2.93	5.45	3.18	1.61	4.51	5.51	1.4	4.59
	Prob>chi2	0.11	0.23	0.07	0.2	0.45	0.1	0.06	0.5	0.1
UGANDA	adj chi2(2)	6.46	5.53	2.49	2.69	1.28	4.22	12.95	1.91	11.83
	Prob>chi2	0.06	0.06	0.29	0.26	0.53	0.12	0.16	0.39	0.28

Correlation analysis

Correlation Analysis involves the investigation of the relationship between two variables. The correlation coefficient measures the strength of the association between the two variables. This study set out to test the relationship between diaspora remittances and financial deepening using correlation matrix presented in the table 5 below, also the relationship between the other variables are also presented.

Table 5: Correlation matrix

	FSD_1	FSD_2	FSD_3	FDI	GDP	INF	WR	TO	WR_{t-1}
FSD_1	1								
FSD_2	0.9041	1							
FSD_3	0.8825	0.9231	1						
FDI	-0.4613	-0.5305	-0.3823	1					
GDP	-0.2785	-0.4769	-0.3566	0.2681	1				
INF	0.101	0.1163	0.1717	-0.1068	-0.1142	1			
WR	0.1777	0.0699	0.0995	0.1844	-0.0295	-0.0851	1		
TO	0.6556	0.5889	0.7198	-0.0539	-0.2016	0.3514	0.1681	1	
WR_{t-1}	0.1565	0.0535	0.0598	0.1984	-0.001	-0.0757	0.8656	0.1237	1

5% critical value (two-tailed) = 0.2084 for n = 89

In the case of EAC member countries as illustrated in the correlation matrix above, there is a positive relationship between diaspora remittances and the three proxies for financial deepening. For the three proxies of financial sector deepening and diaspora remittances the relationship is positive but not significant at the 5% critical value. The positive relationship between diaspora remittances and financial sector deepening is in line with most theory. We also observe that the three measures of Financial sector deepening are highly correlated with FSD_1 and FSD_2 having a correlation coefficient of 0.9041, FSD_1 and FSD_3 having a correlation coefficient of 0.8825 and finally FSD_2 and FSD_3 having a correlation coefficient of 0.9231. This shows they are good measures of the same variable.

Regression analysis

The results of running the panel data to have a regression are detailed in table 6 below for the three proxies of financial deepening using the fixed effect model.

Table 6: Regression models for the EAC countries

	Model 1 (FSD 1)	Model 2 (FSD 2)	Model 3 (FSD 3)
Variable	**FE**	FE	**FE**
FDI	0.4086 (1.41)	-0.2672 (-0.69)	0.0150 (0.09)
GDP	0.0561 (0.54)	-0.1910 (-1.05)	0.2158** (2.62)
INF	-0.16905* (-2.45)	-0.2926** (-3.16)	-0.1378 ** (-3.28)
WR	0 .3049 (0.72)	0.0858 (0.15)	0.2795 (1.08)
TO	0.2946** (5.40)	0.1963** (2.68)	0.2257** (6.78)
WR_t-1	0.5081 (1.23)	0.4157 (0.75)	-0.4347 (-1.73)
Constant	1.1392 (0.49)	14.4184** (4.59)	14.5269** (10.18)
Observations	89	89	89
R^2	0.8735	0.9067	0.9599
Adjusted R^2	0.8573	0.8948	0.9548
F Statistics	8.82**	2.61*	11.56**

The t or z values are given in parenthesis. **, * is significant at 1% and 5% level of significance respectively.

As the Breusch-Pagan model led us to the conclusion that the fixed effects model is the most appropriate for our study, the following are the regression equations that were obtained from the analysis as summarized in table 6 above;

$$\mathbf{FSD_1 = 1.1392 + 0.4086 * FDI + 0.0561 * GDP - 0.1691 * INF + 0.3049 * WR + 0.2946 * TO + 0.5081 * WR_{t-1} + \varepsilon}$$

$$\mathbf{FSD_2 = 14.4184 - 0.2672 * FDI - 0.1910 * GDP - 0.2926 * INF + 0.0858 * WR + 0.1963 * TO + 0.4157 * WR_{t-1} + \varepsilon}$$

$$\mathbf{FSD_3} = \mathbf{14.5269} + \mathbf{0.0150} * \mathbf{FDI} + \mathbf{0.2158} * \mathbf{GDP} - \mathbf{0.1378} * \mathbf{INF} + \mathbf{0.2795} * \mathbf{WR} + \mathbf{0.2257} * \mathbf{TO} - \mathbf{0.4347} * \mathbf{WR_{t-1}} + \boldsymbol{\varepsilon}$$

From model 1, FSD_1 (Domestic credit to private sector as percentage of GDP) has a positive relationship with diaspora remittances but this is not significant as the t-statistic is less than 1.96 which is the critical value at 95% confidence level. Two control variables, inflation and trade openness are significant whilst GDP growth FDI and lagged remittances is not significant. The model shows goodness of fit as it's F-statistic of 8.82 is significant as it's p-value is 0.0000, which is less than p-critical value of 0.05. The model also has a high R^2 and adjusted R^2 of 87.35% and 85.73% which means that the independent variables in the model explain the variance in the dependent variable to a large extent.

From model 2, FSD_2 (Total domestic credit provided by financial sector as percentage of GDP) has a positive relationship with diaspora remittances but this is not significant as the t-statistic is less than 1.96 which is the critical value at 95% confidence level. Two control variables, inflation and trade openness are significant at the 99% confidence level, whilst FDI, GDP growth and lagged remittances are not significant. The model shows goodness of fit as it's F-statistic of 2.61 is significant as it's p-value is 0.0234, which is less than p-critical value of 0.05. The model also has a high R^2 and adjusted R^2 of 90.67% and 89.48% which means that the independent variables in the model explain the variance in the dependent variable to a large extent.

From model 3, FSD_3 (Degree of monetization, M_2 as percentage of GDP) has a positive relationship with diaspora remittances but this is not significant as the t-statistic is less than 1.96 which is the critical value at 95% confidence level. Three control variables, inflation and trade openness and GDP growth are significant at the 99% confidence level whilst lagged remittances and FDI is not significant. The model shows goodness of fit as it's F-statistic of 11.56 is significant as it's p-value is 0.0000, which is less than p-critical value of 0.05. The three models above show us consistently that remittances have a positive effect on financial sector deepening in the East African Community but this is not significant. The model also has a high R^2 and adjusted R^2 of 95.99% and 95.48% which means that the independent variables in the model explain the variance in the dependent variable to a large extent.

Discussion of Findings

As presented in table 6, 87.35%, 90.67%, and 95.99% of the variations of financial deepening in the EAC are explained by the variations in the six indicated determinants of financial deepening. The results show that diaspora remittances, our key independent variable has a positive relationship with financial deepening in the East African Community but this relationship is not significant. Thus, the positive relationship obtained from these findings is in line with literature as some authors have shown that remittances have a positive relationship with financial deepening Esteves & Khoudour-Castéras (2011); Gupta et al. (2009); Oke et al. (2011) and Aggarwal et al. (2011) have shown in their studies that remittances have a positive effect on financial sector deepening. However, this study finds that the relationship between the two variables is not statistically significant across all the models employed in this analysis.

The relationship between foreign direct investments and financial deepening has been shown to be positive but not significant in all the three models. For the first model, FDI may have a positive coefficient as the funds from FDI can be lent to the private sector thus increasing the level of financial deepening. For the second model, the coefficient could be positive as FDI inflows go to the banks as deposits hence extra credit creation and this increases the level of financial deepening in an economy. For the third model, the relationship is positive as increase in cash FDI flows increases the amount of money and quasi money available in the economy, though the relationship has been shown not to be statistically significant.

For gross domestic product per capita growth, the first model shows that the relationship is positive. This relationship between the two variables is supported by Chang & Wu. (2012). But this relationship is not statistically significant, the second model shows the relationship as being negative but not significant at the 5% significance level whilst the third model shows the relationship as being positive and significant. The results from the models may be an indication that economic growth has not been tapped to increase financial deepening. Also, the data has some volatility in the rate of GDP growth in some of the EAC countries may lead to the mixed basket of results as achieved above. The mixed effects may also suggest that economic growth and financial deepening are independent (Olodele, 2000).

For inflation, the results are in agreement with a priori expectations that the level of inflation in an economy would reduce the level of financial deepening. It is seen that across all the models employed, the relationship between inflation and financial deepening is negative and significant at the 5% significance level. Naceur et al. (2007) investigated the nexus between inflation and financial development and came to the conclusion that economies that experienced higher levels of inflation had lesser financial deepening.

The control variable, trade openness, shows a positive relationship with financial sector deepening in the EAC. The relationship is both positive and consistently significant across all the models that were employed in this analysis. Huang and Temple (2005) find that a rise in the level of market openness results into increase in financial depth. This relationship is thus in line with literature.

The final control variable adopted, lagged diaspora remittances, the first model shows that the relationship is positive. This relationship between the two variables is supported by various authors, (Oke et al., 2011); (Aggarwal et al., 2011). But this relationship is not statistically significant. The second model shows the relationship as being positive and also not significant at the 5% significance level whilst the third model shows the relationship as being negative but not significant. The results from the models may be an indication that remittances received in a prior period have not been fully tapped to increase financial deepening in all aspects.

Summary of Findings

The objective of the study was to determine the effect of remittances from diaspora on financial sector deepening in the East African Community. The fixed effects model for panel estimation was adopted in this analysis to determine the effects of diaspora remittances on financial sector deepening in the EAC. The proxies for financial deepening utilized in this study are: domestic credit to private sector as a percentage of GDP, total domestic credit provided by the financial sector as a percentage of GDP and M_2, a degree of monetization, as a percentage of GDP. The research covered a period of 20 Years from 1997 to 2016 where the dependent variable was financial sector deepening, the independent variable was diaspora remittances whilst the control variables employed in the study were foreign direct investments, per capita GDP growth, inflation, trade openness and remittances lagged one period.

This study established, from the three models analyzed in this study that diaspora remittances have a positive effect on financial deepening in the EAC but the relationship is not statistically significant across all the three models. The relationship between the control variables and financial sector deepening were also established. The relationship between FDI and financial sector deepening was determined to be positive from the first and third model and negative in the second model but this relationship was not significant across all the three models.

The relationship between GDP and financial deepening was shown to be positive in the first model and third models and negative in the second model. This relationship was found to be not significant at the 5% significance level for the first and second models whilst it was significant for the third model. For inflation, the relationship with financial deepening was shown to be negative and significant at the 5% significance level for all the three models employed in the analysis. The relationship between trade openness and financial deepening it was shown to be positive and significant at the 5% significance level for all the three models. The final control variable adopted in the analysis, remittances lagged one-time period, the first and second models establish the relationship with financial sector deepening to be positive but not significant and the third model establishes the relationship to be negative and not statistically significant at the 5% significance level.

Conclusions

From the analysis made in this study, this study concludes that diaspora remittances have a positive effect on the level of financial deepening in the East African community. This finding is in line with a study carried out by Peria, Mascaro and Moizeszowicz (2008) that focuses on the Latin American countries and the Caribbean region for the period 1975 – 2005. The authors reveal that the impact of remittances on financial development is though positive but very marginal. Aggarwal et al. (2011), Oke et al. (2011) and Gupta et al. (2009) in their study, showed that remittances have a positive effect on financial sector deepening and that this relationship is significant. In this study, we have a departure from that as though the relationship we obtained between the two variables is positive, that relationship is not statistically significant. This effect may not be significant because the remittances are only but a very small faction of GDP but with the increase in volumes of the same they'd become significant as one of the models shows that remittances are significant at the 90% confidence level and with an increase in volume they'd become more significant.

The study also came to a conclusion that the relationship between FDI and financial deepening was shown by two of the models to be positive, this means an increase in FDI flows that are in the form of liquidity, can foster deepening in the financial sector through the creation of credit and provision of increased financial services.

For GDP, a priori assumption is that an increase in GDP causes demand for more financial products thus causing financial deepening, this is supported by two of the models, the other one may be affected by the fluctuation in the per capita GDP witnessed in some of the EAC countries. Inflation having been shown to be negatively related to financial deepening, means that when the level of inflation is reduced then more financial deepening occurs in the countries and this is in line with literature.

Trade openness has been shown to be positively and significantly related to financial sector deepening. This therefore means that increase in exports and imports into the country makes traders seek financial products that increase the level of financial deepening and this has been shown to be in line with literature and previous studies. For lagged diaspora remittances, the relationship has been shown to be positive for the first and second models and this is an indication that remittances have a positive effect on financial sector deepening due to increased funds in the economies. The third model that shows a negative relationship between the two variables may be an indication that previous years remittances don't have an impact on the current level of money in circulation or the previous year's remittances are independent of the current year's level of monetization.

Recommendations

The study provides evidence that remittances can increase the level of financial deepening in the country, based on the findings of this paper, we therefore recommend that strategies that enhance this relationship be put in place as a mechanism of stimulating financial deepening in the EAC.

Some of the strategies could include investing in financial technology innovation so as to reduce the cost and increase the ease and speed of funds transfer and thus encourage more remittances, Increased monitoring and regulation of financial institutions and adoption of standard procedures in the EAC member countries in order to ensure stability of the financial sector and also foster a

culture of good corporate governance in the financial sector in order to increase the level of trust and thus increased financial intermediation which leads to financial deepening.

The countries can also implement macroeconomic policies that foster economic growth as it is a factor that contributes to the financial deepening of an economy. The countries may also invest more in improvement of infrastructure, lessen the bottlenecks in opening and running a business in the economy and strengthen property rights and these measures will attract more foreign direct investments and thus increase the level of financial deepening. The member countries of the EAC could also put in place measures such as strategic grain reserves, encourage sustainable agricultural practices so as to increase food security. Food forms a large part of the basket of goods that the CPI is calculated from.

The governments of the respective countries can also apply monetary policies in order to tame inflation as it has a negative impact on financial deepening. These measures reduce inflation and foster financial deepening. Finally, with respect to trade openness the member countries can foster more trade by encouraging exports through reducing trade barriers, and making the export process easier. Also, the government can employ and forex adjustments to make the prices of its goods and services competitive on the global market. There measures would help in increasing the level of financial deepening in the EAC member countries.

References

Abdullah Mohamoud; Monica Fréchaut. (2006). *Social remittances of the African diasporas in Europe.* Lisbon: The North South Centre of the Council of Europe.

Aggarwal, R., Demirgüç-Kunt, A., Soledad, M., & Pería, M. (2010). Do Remittances Promote FInancial Development? *Journal of Development Economics*.

Ahmed, S. N., & Ansari., M. I. (1998). Financial Sector Development and Economic Growth: The South-Asian. *Journal of Asian Economics,* 503-517.

Becker, G. S. (1974). A Theory of Social Interactions. *Journal of Political Economy*, 1063-1093.

Biller, S. (2007). *International Finance and Development Briefing.* IOWA: University of IOWA.

Brown, R. P., Carmignani, F., & Fayad, G. (2011). *Migrants' Remittances and financial Development: Macro-and Micro-level Evidence of a Perverse Relationship.* Oxcarre Working Papers.

Calderon, C., Fajnzylber, P., & Lopez, H. (2007). *Remittances and growth: The role of complementary policies," in Remittances and Development: Lessons from Latin America.* Washington DC: World Bank.

Catrinescu, N., Leon-Ledesma, M., Piracha, M., & Quillin, B. (2009). *Remittances, Institutions and Economic Growth.* World Development, Elsevier.

Chami, R., Fullenkamp, C., & Jahjah, S. (2003). *Are Immigrant Remittance Flows A Source Of Capital For Development?* Washington: International Monetary Fund Working.

Cherono, M. R. (2013). *The effect of remittances and financial development on private investment in Kenya.* Nairobi: An unpublished Masters project.

Chowdhury, M. B. (2011). Remittances flow and financial development in Bangladesh. *Economic Modelling*, 2600-2608.

Detragiache, E., & Demidguk-Kunt, A. (2005). *Cross-Country empirical studies of systematic bank distress: A Survey.* National Institute of Economic Review.

DFID. (2004). *The Importance of Financial Sector Development for Growth and Poverty Reduction.* Glasgow: Department for International Development.

Esteves, R., & Khoudour-Castéras, D. (2011). Remittances, capital flows and financial development during the mass migration period, 1870–1913. *European Review of Economic History*, *15(3)*, 443-474.

Fayissa, B., & Nsiah, C. (2012). Financial Development and Remittances in Africa and the Americas: A Panel Unit-Root Tests and Panel Cointegration Analysis. *Working Papers, Middle Tennessee State University, Department of Economics and Finance*.

Fonchamnyo, D. C. (2012). The Altruistic Motive of Remittances: A Panel Data Analysis of. *International Journal of Economics and Finance*.

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

Gupta, S., Pattillo, C. A., & Wagh, S. (2009). Effect of remittances on poverty and financial development in Sub-Saharan Africa. *World Development*, 104-115.

Kaijage, E., & Elly, D. (2014). Financial Integration relationships and linkages in East African Community (EAC) equity markets. *10Th Operations Research Society of Eastern Africa(ORSEA) Conference.* Nairobi.

Kapur, D. (2003). *Remittances: The new development mantra?* Cambridge: Harvard University Press.

King, R., & Levine, R. (1993). Finance and Growth: Schumpeter Might be Right. *The Quarterly Journal of Economics*, 717-737.

Kumar, R. R. (2011). *Exploring the role of Trade, Aid, Remittances and Financial Development in Pakistan.*

Lucas, R., & Stark, O. (1985). Motivations to Remit: Evidence from Botswana. *Journal of Political Economy*, 901-918.

Mlachila, M., Cui, L., Jidoud, A., Newiak, M., & Radzewicz-Bak, B. (2016). *Financial Development in Sub-Saharan Africa – Promoting Inclusive and Sustainable Growth.* Washington, International Monetary Fund.

Mundaca, G. (2009). Remittances, financial markets development and economic growth: *Review of Development Economics*, 288-303.

Naceur, B., Ayadi, R., Arbak, E., & WillemPieter, D. (2013). Determinants of Financial Development across the Mediterranean. MEDPRO Technical Report No. 29.

Nyamongo, E., Misati, R., Kipyegon, L., & Ndirangu, L. (2012). Remittances, financial development and economic growth in Africa. *Journal of Economics and Business*, 240-260.

Ojapinwa, T. V., & Odekunle, L. A. (2013). Workers' Remittance and Their Effect on the Level of Investment in Nigeria: An Empirical Analysis. *International Journal of Economics and Finance*, 89-102.

Oke, B., Udianye, O., & Okpala, O. (2011). Impact of Worker's Remittances on Financial Development in Nigeria. *International Business Research*, 218-225.

Olodele, A. (2000). The relationship between financial deepening and economic growth in Tanzania. *Journal of International Development*, 939-950.

Peria, M., Mascaro, Y., & Moizeszowicz, F. (2008). Do Remittances Affect Recipient Countries´ Financial Development? In P. Fainzylber, & H. López, *Remittances and Development, Lessons from Latin America*, (pp. 171-215). Washington, DC: The World Bank.

Ratha, D. (2013). *The Impact of Remittances on Economic Growth and Poverty reduction.* Washington: Migration Policy Institute.

Rubyusta, J. M. (2012). The Role of Remittances in Development: The Case of Rwandan Diaspora Remittances. *Rwanda Journal Volume 26, Series B, 120-132.*

The World Bank. (2017). *Remittance Prices Worldwide – Issue 21,* Washington DC: The World Bank.

World Bank. (2006). *Global Economic Prospects 2006: Economic Implications of Remittances and Migration.* Washington DC: World Bank.

World Bank. (2016). *Financial Sector development and Regionalization Project 1.* Washington: World Bank.

Yaseen, H. S. (2012). *The Positive and Negative Impact of Remittances on Economic Growth in MENA Countries.* UAE: The Journal of International Management Studies.