

EFFECT OF FOREIGN REMITTANCES ON PRIVATE CONSUMPTION, INVESTMENT, IMPORT AND OUTPUT IN EAST AFRICA COMMUNITY

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ABSTRACT

Foreign remittances to East Africa Community (EAC) have increased considerably in the past two decades becoming one of the largest sources of foreign currency earnings. However, despite the remarkable growth of remittances in EAC, little has been researched on its effect on consumption, investment, import and output at macro level. Most of the available literatures concentrates on its effect on poverty reduction at household levels. This study, therefore, sought to empirically test the link between remittances and consumption, investment, import and output. The study used correlational research design anchored on a linear Keynesian macroeconomic model with a dynamic outlook. Panel data set for the period 2000-2014 from the World Bank database for the five EAC countries, namely; Kenya, Uganda, Tanzania, Rwanda and Burundi were used. The study used a Two Stage Least Square (TSLS) method of estimation and established that of foreign remittances have a positive effect on private consumption, investment, import and output in EAC. The study recommends that macroeconomic policies should focus on its sustainability to promote economic growth and makes implications for policy and further research.

Keywords: Remittances, consumption, investment, import and output.

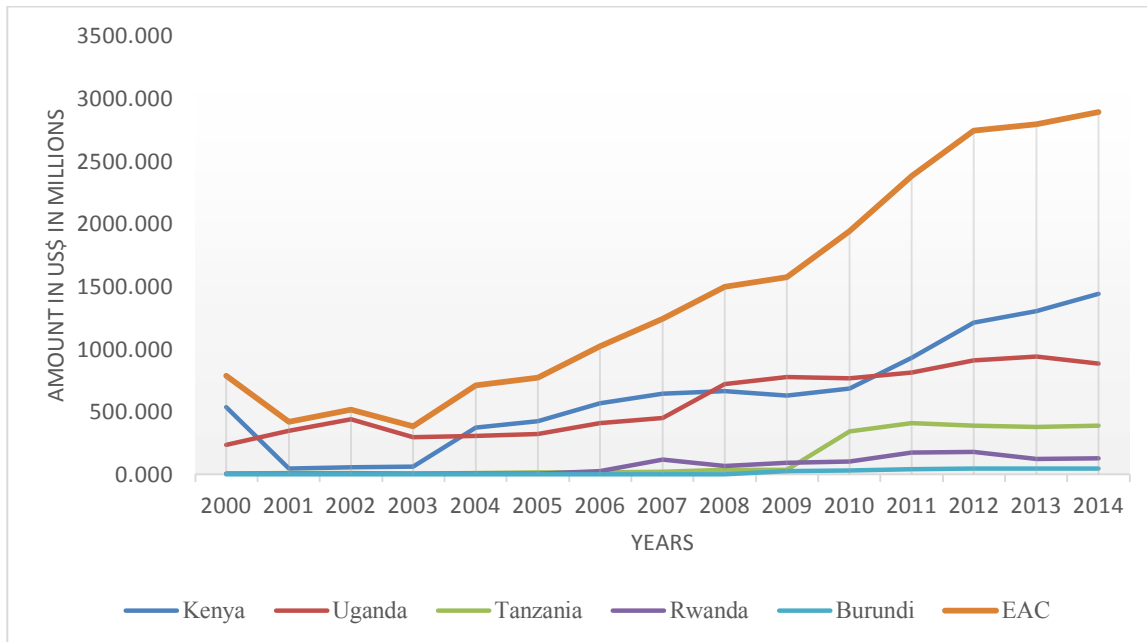
1. INTRODUCTION

Individuals from developing countries relocate to higher income regions such as United States of America, Middle East and Europe in the hope of better job opportunities and good standard of living. It is estimated that more than 250 million people live outside their countries of birth,

making significant contributions to the social and economic development to their mother countries (World Bank, 2015). This figure could be much high as not all emigrants are registered and it is likely to increase rapidly due to demographic forces, globalization and climate change. African countries have an estimated 30 million international emigrants (Ratha & Sonia, 2011). Ratha et al. (2011), estimated that the East Africa Community (EAC), comprising of Kenya, Uganda, Tanzania, Burundi and Rwanda, had over 2.1 million emigrants internationally by 2010. Studies have generally indicated that as emigrants improve their own standard of living through the earnings in the foreign countries, they also improve the life of their family members and friends in their mother countries. They often send a few hundred dollars at a time to family members and friends they leave behind which add up to billions of dollars annually (IMF, 2008). Family ties in the form of mutual caring, are important motivations of remitting fund from abroad (Chami et al, 2003) . Migrants may be motivated to remit money to their home countries for investment purposes. In this case, remittances will flow as a disguised capital to respond to real investment opportunities in the migrant's country of origin (Lucas & Stark ,1985).

Foreign remittances to developing countries have increased considerably in the past two decades becoming one of the largest sources of foreign earning in developing countries. It constitutes the second-largest financial inflows to developing countries after Official Development Assistance (World Bank, 2006) and (Ratha, 2005). According to the World Development Indicators, remittances from the diaspora to developing countries were estimated at only US\$ 47 billion in 1980, increased to US\$ 49 billion in 1990. In 2000, it doubled to US\$ 102 billion, and from there, it tripled to US\$ 321 billion in 2010. This has now tremendously increased to US\$ 436 in 2014 (World Bank, 2015) of which US\$ 2.9 billion was sent to EAC. The growth in remittances in EAC in the recent past is remarkable as demonstrated in Figure 1. It increased from US\$ 791 million in the year 2000 to US\$ 2.9 billion in the year 2014. Actual figures could be higher than this, because in many occasions remittances are often brought in cash or kind by migrants themselves or sent through friends, therefore, not recorded when entering the country. Spatafora (2005) estimates that between 35 and 75 percent of remittances world wide are channeled through informal channels which are not represented in official statistics.

Figure 1: Remittances to EAC between 2000 and 2014



Source: The authors using data from World Bank Development indicators (2017).

Foreign remittances represent a considerable proportion of foreign exchange proceeds and an indispensable source for covering balance of payment, as well as being a generator of high demand in developing economies. According to IOM (2015), foreign remittances in Sub-Saharan Africa represent about 5 percent of GDP or 27 percent of export receipts. Foreign remittances to EAC represented 2.5 percent, 1.6 percent, 2.0 percent and 2.0 percent of the GDP in 2000, 2005, 2010 and 2014 respectively. In the individual economies, in 2014, remittances represented 2.3 percent, 3.3 percent, 1.0 percent, 1.6 percent and 1.6 percent of GDPs for Kenya, Uganda, Tanzania, Rwanda and Burundi respectively. In 2000, it represented 20 percent and 36 percent of the proportion of exports in Kenya and Uganda respectively while in 2014, it represented 22 percent of the proportion of export for Burundi. With the steady increase in volume across the EAC region, knowledge about their effects on macroeconomics is vital as the region aspires to form a trading block with a single currency by 2024 (IMF, 2016). Most of the available literatures are non EAC specific.

Studies have generally indicated that remittances are effective as compared to development aid since they are sent directly to the recipients hence, making them less vulnerable to administrative challenges and corruption. Receivers are able to identify their own greatest needs and allocate the remittance income accordingly making them popular. In times of crisis, migrant investors are

expected to be more loyal than other foreign investors that lack personal ties to the country, and the former may be especially interested in financing infrastructure, housing, health, and education projects (Ratha, 2013). They do not decline even in conditions of instability and poor governance. This was witnessed in Kenya during the post-election violence, where remittances increased from US\$ 570 million in 2006 to US\$ 645 million and US\$ 667 million in 2007 and 2008 respectively. This period witnessed massive death, destruction of properties and displacement. This, therefore, raises questions whether foreign remittances are really meant for investment purposes or play a counter-cyclic role i.e. assist family members and friends in times of hardship.

The macroeconomic effect of foreign remittances remains a subject of contrast especially in the receiving economies. Some scholars present a positive perspective while others present a negative result. As part of money supply, remittances are expected to produce a considerable growth effect in output through investments as more domestic credit is available, plus the multiplier stimulus effects from additional spending. Similarly, foreign remittances may influence private consumption which could lead to economic growth as consumption creates investment demand through multiplier effect (Najid, et al., 2013), (Gupta, et al.,2007), (Barajas et al.,2009) and (Ramocan, 2010). In most developing economies where households have little wealth like in the case of EAC, individuals might forgo possibly profitable investment opportunities and consumers also might consume below their desired levels (Salahuddin& Gow ,2015) and (Stern & Akkoyunlu, 2012), therefore, remittances are expected to fill this gap. In addition, in developing economies where access to credit is inadequate, individuals might use remittances to relax constraints. This relaxation would in turn get reflected in higher growth as the interest rate declines, real sector activity may pick up driven by higher investment financed by foreign remittances (Ahmed et al., 2013).

On the contrary, the inflow of foreign exchange and the corresponding rise in demand for local currency can cause pressure on the exchange rate towards its appreciation thus fuelling inflation (Acosta, et al.,2009), (Stratan et al, 2013). Inflow of remittances also determines an increase in the household income which leads to rise of aggregate demand which implies rise of inflation (demand-pull) which impacts the economy negatively. Since a high percentage of remittances are used in consumption, the increase in consumption shifts the demand which creates an inflationary pressure in the economy (Baldera & Nath, 2008). In addition, foreign remittances may be subject to a severe moral hazard problem as recipients may channel funds from the intended use like for investment to consumption of leisure, therefore, reducing labour force participation consequently reducing economic activities (Barajas et al., 2009) and (Chami et al., 2003). With increased investment and consumption helping growth, and appreciation of currency hampering it, the outcome is ambiguous.

In EAC economies, researchers seem to be in agreement that it has contributed enormously to reduction of poverty in the receiving households, however, their effect on macroeconomic variables is little researched, theoretical studies concentrate on their impact on poverty and income distribution. This lack of information prevents both governments and financial institutions from formulating policies to manage remittance inflows. This study, therefore, sought to fill this inadequacy and contribute to the economic analysis of the effects of remittances on consumption, investment and imports with the ultimate purpose of estimating their contribution to growth.

2. LITERATURE REVIEW

Theoretical perspective:

The significant effects of transfers on receiving economies were discussed by Keynes(1929), the direct effect of the foreign remittances is on aggregate demand which results to increase in consumption expenditure which in turn triggers supply (investment). In this approach, the effect on the output depends on the interaction between the size of the foreign remittances and the calculated marginal propensity to save (MPS).

The savings are then used in private investment which results to increase in production of both goods and services in an economy, and consequently growth in output (GDP). Barajas et.al (2009), observes that in economies, where domestic households face financial limitations that constrain their investment activities due to poor domestic financial development like in the case in EAC; remittances in this case can be substituted for domestic funds, which are lacking to enable recipient households improve their rate on capital accumulation both human and physical. Stahl & Arnold (1986) also observes that creditworthiness of domestic investors is likely to be improved by foreign remittances as they may lower competition of credit facilities from financial institution, therefore, lowering cost of capital through interest rates in the recipient economies. He also notes that, the multiplier effect of foreign remittance utilized in private consumption may also have significant positive effect on output in the recipient economies.

Stark (1991), postulates that increase in income due to foreign remittances is a boost for investment even if the actual cash remitted is not invested because it provides the recipients with insurance, which allows them to engage in high risk activities like increasing investment in production and adoption of emerging technologies which could not have been ventured into. Generally, remittances may affect the rate of private investment in an economy depending on where they are spent. However, how remittances are spent depends in turn on the motives driving the remittances flow which can either be altruism or portfolio approach -self-interest (Chami et al. (2003).

Empirical Literature:

Giuliono & Arranz (2009) in their study on the effect of remittances on economic growth in developing countries established a positive effect. They postulates that foreign remittances are responsible for boosting growth in economies with inadequate financial systems through provision of alternative financial support to investors and assisting countries to deal with liquidity limitations. The study used panel data for 100 developing countries covering the period from 1975 to 2002. The findings by Giuliano and Arranz are supported by studies by Adela & Dietmar (2013), Ahmed, et al. (2013), Simon et al., (2013), Azam & Khan (2011), Ratha (2005), Raheem et al., (2014), Mukit et al.(2013), Hrushikesh (2012), Iqbal & Abdus (2005). However, the positive contributions are contested by Kiyalbek & Budaichieva (2012), Farid & Mazhar (2013), Stratan et al. (2013), Iqbal, et al., (2013) and Nazir et al. (2012), and Baldera & Nath (2008).

Tansel & Yasar (2010) established that remittances increased income through multiplier process in Turkey. The study established that remittances induced output growth rate throughout the study period 1968-2003. During this period, the remittances financed the imports of machinery and other intermediate goods which increased domestic production. On the contrary, Kadir (2013) established a negative impact on growth in Turkey. The study used time series data for the period from 1970 to 2005. In Nigeria, Akano et al. (2013) established a positive relationship between remittances and growth. The study used annual data for the period from 1991 to 2011 from World Bank and Central Bank of Nigeria. However, the positive effect is contested by Akonji & Wakili (2013). The authors examined the impact of net migrant remittances on economic growth in Nigeria using a time series data for the period 1985 to 2010 and established a negative impact.

Fayissa & Nsiah (2010) observes that remittances can boost economic growth in countries with less developed financial system as it provides an alternative way of financing investment and ease liquidity limitations. The study used unbalanced panel data for 37 African countries spanning from 1980 to 2004. The authors established that a 10 percent increase in remittances lead to a 0.3 percent increase in the GDP per capita income. On the contrary, Chami et al., (2003) found that remittances had a negative effect on growth. The authors argue that when families receive remittances, they decrease their own productivity which translates into a reduction in the labour supply for the developing country. The study covered 113 countries across the world and used a panel data between 1970 and 1998. This contradicts findings by Glytsos (2005) in Egypt and Morocco where an increase in remittances increased private consumption by 0.33 percent and 0.56 percent respectively. The study also established that an increase in remittances by 1 percent, increased investment by 0.39 percent in Morocco, increased import by 0.24 percent in Egypt. In overall, Glytsos (2005) established that an increase in

remittances by 1 percent increased income (output) by 0.95 percent and 2.80 percent in Egypt and Morocco respectively through multiplier effects in the first year and reduced gradually over the years. However, the study by Glytsos did not separate the effect of remittances from that of income on the variables under study.

A study by Gupta, et al (2007) on the impact of remittances on poverty and financial development in Sub-Saharan Africa (SSA) found out that remittances reduce poverty and contribute to financial development. The study used a panel data for 44 countries for the period from 1975 to 2004. Ajayi, et al. (2009) established similar results in SSA. The study used a cross-country data drawn from 38 countries and used a multiple regression analysis. Balde (2010) established a positive relationship remittances and economic growth. The study by Balde covered 34 SSA over the period 1980-2004 and found out that a 10% increase in remittances increased savings by 7% and investment by 6.5%. On the contrary, Sighn, et al. (2009) established a negative effect. The study covered 36 SSA counties over the period 1990-2005. A study by Ondieng'a et.al (2017) established that an increase of income by one (1) dollar, would increase consumption, investment and import by 0.71, 0.31 and 0.30 dollars in Kenya respectively. The study used time series data for the period from 1985 to 2014. Similarly, a study by Kii, et al. (2014) established a positive relationship between remittances and output in Kenya. The authors used data for the period 1970-2010. These findings are supported by Mwangi & Mwenda (2015). The authors established that remittances indicators are significant factors influencing the economic growth in Kenya. They used data from the World Bank's Development Indicators for the period 1993-2013. However, other than the effects remittances has on output, both studies did not demonstrate how remittances affect private investment, consumption and imports which are the key bearings of growth.

Owing the significance attached to remittances in this region and in light of uncertainty in terms of its effect on output, private investment, consumption and imports. It is important, therefore, to examine its effect on these variables to facilitate effective policy formulation. This study therefore, contribute to the existing knowledge by making the following contributions: (1) most studies in the literature tend to conduct panel studies in either Africa as a whole, developing countries or SSA (2) The available literature regarding remittances in EAC are surveys at household levels that demonstrate on how they impact on poverty. This particular study is EAC specific and has demonstrated the role played by remittances on economic growth in respect to its contribution to, private investment, consumption and imports.

3. METHODOLOGY

The study was conducted in EAC which is an intergovernmental organisation composed of five countries in the African Great Lakes region in Eastern Africa comprising of Kenya, Uganda, Tanzania, Rwanda and Burundi and used a panel data covering the period 2000 to 2014. All variables are in US\$ in millions. This is the period the region has worked as a block and witnessed a remarkable increase in remittances. EAC was founded in 1967 covering Kenya, Uganda and Tanzania, collapsed in 1977 and was revived in 2000. The new EAC includes Rwanda and Burundi. The Community was formed with the objective to attain a sustainable growth and development by promoting a more balanced and harmonious development of the member countries (Tpsftz, 2017). The region is expected to have a single currency by 2024 (IMF, 2016).

The study employed a correlational design to describe the relationship that exists between remittances and output, investment, consumption and imports. The panel data was chosen as opposed to using time series data of individual countries because it gives more informative data, more variability, less collinearity among variables, more degree of freedom and more efficiency (Gujarati & Porter, 2009). In addition, the time series data for individual countries has only 15 observations per variable which could not give accurate estimates, with panel data, we have 75 observations per variable which logically gives a more accurate estimates. The rule of the Thump recommends more observations when regressing a linear model.

Model specification:

A linear Keynesian macroeconomic model with a dynamic outlook proposed by Tansel & Yasar (2010) was used in the estimation. The model contains three behavioural functions; namely, a consumption function, investment function and import function together with a national income identity through which, foreign remittances are introduced as an exogenous variable into the proposed model. The objective of the model is to establish the effects of an exogenous shock of remittances on these four endogenous variables (consumption, investment import and output), which determines the short-run effects and eventually trace their long-run impact.

Consumption function:

The consumption function is based on the Friedman's theory of consumption (1957) with a slight modification to take care of the foreign remittances. Foreign remittances received in a country are not included directly in the country's GDP because they do not represent goods and services in the country, nevertheless, they get their way into the GDP through consumption or investment. Therefore, in order to avoid double accounting, we subtract foreign remittances (R) from GDP to

obtain Z i.e. Z=GDP-R, which is regressed together with R which is the variable of interest as presented in equation (1)

$$C_{it} = a_0 + a_1Z_{it} + a_2C_{it-1} + a_3R_{it} + \varepsilon_{it} \dots\dots\dots 1$$

However, Z which is GDP-R and R are highly collinear variables naturally. They share a common trend, all increase over time with more or less the same rate, leading to collinearity among them. Gujarati & Porter (2009) advises that, in the presence of high collinearity, it is difficult to estimate the individual regression coefficients precisely, but with the linear combinations of these variables, coefficients may be estimated more accurately. Though, it is difficult to disentangle the separate influence of Z and R on private consumption, but with the average proportion of the foreign remittances, this can be done. If we let the proportion of the foreign remittances to be ϕ , then the coefficient for remittances can be estimated as $a_3 = \phi a_1$. In order to avoid correlation between these two variables in the regression, we combine R and Z to get Equation (2)

$$C_{it} = a_0 + a_1Y_{it} + a_2C_{it-1} + \varepsilon_{it} \dots\dots\dots 2$$

Where,

$Y_{it} = Z_{it} + R_{it}$, once a_1 is estimated, then a_3 is estimated from the postulated relationship between a_1 and a_3 , which is $a_3 = \phi a_1$,

C= Private Consumption, C_{it-1} is the lagged consumption (consumption from the previous year), subscript t stands for time or period, a_i 's parameters to be estimated, ε_t is the error term or white noise? It includes the effects of omitted factors at time t and, t is periods (time); (2000, 2001....,2014).

The priori information procedure way of preventing multicollinearity was adopted as opposed to other methods like transformation of variables because, first difference or ratio transformations according to Gujarati & Porter (2009) have serious problems than the cure. There is loss of observations due to the differencing procedure, therefore reducing the degree of freedom and it is not ideal for panel data. In addition, the error term of the transformed regression may not satisfy one of the assumptions of the classical linear regression model which assumes that the disturbances are serially uncorrelated. The ratio model in transformation is likely to turn the error term to be heteroscedastic, if the original term is homoscedastic. Other methods like getting additional or new data is not practical because, the study does not have influence on the data.

Investment function:

In investment, some desired stock levels of capital are required toward which business persons orient their investment activities. This implies that gross investment is dependent on the returns of existing capital stock. As observed by Modigliani & Miller (1958), there is a positive correlation between Investment and business profits, property income, income from transfer (foreign remittances) and capital output. In the model, profits are presumed to be a positive function of income (Y_t), which enters as argument in our investment equation, along with lagged capital stock (K_{t-1}), which allows some time for investment to adjust to the stock. Thus, the expected signs are positive and negative respectively.

As discussed under consumption function, foreign remittances received in a country are not included directly in the country's national income (GDP) because they do not represent goods and services in the country, however, they get their way into the GDP through consumption or investment. In order to avoid double accounting, we subtract foreign remittances (R) from GDP to obtain Z i.e. $Z=GDP-R$, which is regressed together with R in the proposed equation 3.

$$I_{it} = b_0 + b_1 Z_{it} + b_2 K_{it-1} + b_3 R_{it} + \varepsilon_{it} \dots \dots \dots 3$$

However, Z and R share a common trend; it is, therefore, difficult to estimate the individual regression coefficients precisely, but with the linear combinations of these variables, coefficients may be estimated more accurately even if it is difficult to separate the influence of Z and R on investment, but with the average proportion of the foreign remittances, it is possible. If the proportion of foreign remittances to GDP is ϕ , then the coefficient of remittances can be estimated as $b_3 = \phi b_1$. With this priori information, the study combined Z and R to get Y (income). This is done in order to avoid correlation between these two variables in the regression leading to Equation (4).

$$I_{it} = b_0 + b_{i1} Y_t + b_2 K_{it-1} + \varepsilon_{it} \dots \dots \dots 4$$

Where,

$Y_{it} = Z_{it} + R_{it}$, once b_1 is estimated, then b_3 can be estimated from the postulated relationship between b_1 and b_3 , which is $b_3 = \phi b_1$, I_{it} = Private investment at time t,

K_{it-1} = Cumulative gross capital formation at time t, b_{is} are parameters to be estimated, t is periods (time); (2000, 2001...,2014), ε_t is the error term. It includes the effects of omitted factors at time t.

Import function:

The import equation is based on the life-cycle hypothesis as developed for consumption by Ado & Modigliani (1963), incorporating the influence of income and wealth and foreign remittances. However, as indicated in the previous models, foreign remittances which is a variable of interest in the study is not included directly in the country's national income (GDP) because they do not represent goods and services in the country, however, they get their way into the GDP through consumption or investment at the household level. Therefore, in order to avoid double accounting, we subtract foreign remittances (R) from GDP to obtain Z i.e. $Z=GDP-R$, which is regressed together with R in the proposed equation (5)

$$I_{it} = \delta_0 + \delta_1 Z_{it} + \delta_2 K_{it-1} + \delta_3 Z_{it-1} + \delta_4 R_{it} + \varepsilon_{it} \dots \dots \dots 5$$

However, Z and R are highly collinear making it difficult to estimate the individual regression coefficients precisely, but with the linear combinations of these variables, coefficients may be estimated more accurately. With the average propoportion of the foreign remittances, it is possible to get the separate effect. We let the proportion of the foreign remittances to be \emptyset , then the coefficient of remittances can be estimated as $\delta_4 = \emptyset \delta_1$.

$$M_{it} = \delta_0 + \delta_1 Y_{it} + \delta_2 Y_{it-1} + \delta_3 M_{it-1} + \varepsilon_{it} \dots \dots \dots 6$$

Where,

$Y_{it} = Z_{it} + R_{it}$, once δ_1 is estimated, then δ_4 can be estimated from the postulated relationship between δ_1 and δ_4 , which is $\delta_4 = \emptyset \delta_1$, Y_{it-1} is the lagged income, M_{it} = the imports at time t, M_{it-1} is the lagged imports, t is periods (2000, 2001...,2014), $\delta_{i's}$, are coefficients to be estimated.

Output:

The identity function is given as:

$$Y_{it} = C_{it} + I_{it} + G_{it} + X_{it} - M_{it} \dots \dots \dots 7$$

Where:

C=Private Consumption, Y= (GDP-R) +R, C_t is Private Consumption in the domestic market at time t, G_t = Total government expenditure at time t, R_t is the remittances at time t,

X_t = the export at time t, t is periods (time); (2000, 2001...,2014).

Dynamic nature:

The dynamic nature of the model is developed by introducing lagged endogenous variables into the system. The relationship between any endogenous variable and all the predetermined variables of the system of equations, i.e. the reduced form of the expression of the structural equations (2) -(6) is given in the form summarized in Table 1. The dynamic effects of shocks in the exogenous variables are on the endogenous variables are captured by the formular in Table 1.

Table 1: Impact and dynamic multipliers for the effect of a unit change in remittances.

	Impact Multipliers	Dynamic Multipliers		
	Year 1	Year 2	Year 3	Year 4
Consumption	α_1/A	$P(\alpha_1/A)$	$P^2(\alpha_1/A)$	$P^3(\alpha_1/A)$
Investment	b_1/A	$M(b_1/A)$	$M^2(b_1/A)$	$M^3(b_1/A)$
Imports	δ_1/A	$N(\delta_1/A)$	$N^2(\delta_1/A)$	$N^3(\delta_1/A)$
Income	$((\alpha_1 + b_1 - \delta_1)/A)$ $A=1-b_1-\alpha_1 + \delta_1$	$M=b_2(1-\alpha_1 + \delta_1)/A$	$N=\delta_2(1 - \alpha_1 - b_1)/A$	$P=\alpha_2(1 - b_1 + \delta_1)/A$

Source: Tansel and Yasar (2010)

4. RESULT AND DISCUSSION

Stationarity test:

The study tested the (null) hypothesis that $\rho = 1$, with the alternative hypothesis being that $\rho < 1$. If $\rho = 1$, we have a unit root, meaning the time series under consideration is nonstationary. The study employed the Dickey-Fuller (DF) test approach and the results are summarized in Tables 2.

The information in Table 2 reveals that, the estimated test statistics (τ) at level values in absolute terms for data in the study are less than the critical τ values at 5% significance level. Because, in absolute terms the estimated values are less than critical τ values, our conclusion is that the data is not stationary . Therefore, the null hypothesis that the data has a unit root could not be rejected at 5 percent significance level. However, after taking the first order difference, the data is found to be stationary. The estimated τ values in absolute terms are greater than critical τ value at 5 percent significance level. The null hypothesis that each series has a unit root is rejected in the first difference at 5 percent significance level for all data and hold the null hypothesis that each series is integrated of order one. The data in stationarity form was used in

the estimation. Regressing a non-stationary time series variables, often give a very high R^2 (in excess of 0.9) even though there is no significant relationship between the variables (Gujarati & Porter, 2009).

Table 2: Dickey-Fuller (DF) unit root test for EAC variables in the study

Variables	1% critical value	5% critical value	10% critical value	Estimated test Statistics (τ)	
				I(0)	I(1)
<i>Y</i>	-3.678800	-3.113200	-2.818000	-1.197665	-8.302265
$Y_{(t-1)}$	-3.678800	-3.113200	-2.818000	-1.387330	-8.305353
<i>PC</i>	-3.678800	-3.113200	-2.818000	-0.781621	-7.715592
$PC_{(t-1)}$	-3.678800	-3.113200	-2.818000	-0.985062	-7.700465
<i>I</i>	-3.678800	-3.113200	-2.818000	-1.901403	-9.149229
$K_{(t-1)}$	-3.678800	-3.113200	-2.818000	-2.114763	-8.602572
<i>M</i>	-3.678800	-3.113200	-2.818000	-1.050994	-7.945000
$M_{(t-1)}$	-3.678800	-3.113200	-2.818000	-1.296304	-7.978612

Source: The authors using E-Views generated values (2017)

Two Stage Least Square Estimates of the Macroeconomic model:

The TSLS is applied on the EAC as a block and the results are presented in Tables 3. Annual data for the period 2000-2014 are used in all the variables under study. All variables are in stationary form and in US\$ in millions.

Consumption:

Table 3 presents information on the consumption coefficients as proposed in Equation (1). The information reveals that EAC has an estimated marginal propensity to consume (MPC) of 0.66. This implies that an increase in income by one dollar would increase consumption by 66 cents in this region. The coefficient has the right sign and it is statistically significant as demonstrated by the high t-Statistic and low p-values. Since, foreign remittances only constitute 1.9 percent of the total income, therefore the effect of remittances in the coefficient is only 1.9 percent. To get the effect of foreign remittances as proposed in methodology, we multiply 1.9 percent by 66 cents (0.019x66 cents) which is 1.3 cents. This means that an increase in remittances by 1 dollar, would increase consumption by 1.3 cents. The null hypothesis that foreign remittances do not affect private consumption in the EAC region is, therefore, rejected and the alternative hypothesis is accepted.

As demonstrated in Table 3, the model performs in EAC as theoretically expected. The marginal propensity (MPC) ratio is < 1. This agrees with Keynes'(1936) argument that the MPC is positive but < 1. The findings are in agreement with Kiyalbek & Budaichieva (2012)'s findings in Kyrgyzstan where an increase in remittances by 1 unit increased consumption by 0.70 units, Aitymbetor (2006) also established that an increase of remittance by 1 unit increased consumption by 0.68 units in the same economy. Nisar et. Al (2013) established that one percent increase in in the average annual amount of remittances in Pakistan, increased consumption by 0.95 percent. Similary, Ondieng'a et al (2017) established that an increase in income by 1 dollar would increase consumption by 0.71 dollars in Kenya and Tanzania. However, Glytsos (2005) established relatively low MPCs in Egypt and Morocco of 0.33 and 0.56 respectively. Tansel & Yasar (2010) estimated MPC for Turkey at 0.35. However, unlike the previous studies; this study was able to separate the effect of remittance and income. Ondieng'a et al (2017), Glytsos (2005), Tansar & Yasar (2010) did not go beyond the estimation of the MPC to the specific effect of remittances on private consumption.

Table 3: Two Stage Least Square Estimates of the Private Consumption model.

Dependent Variable: PC
 Method: Two-Stage Least Squares
 Date: 05/26/17 Time: 14:11
 Sample (adjusted): 2 74
 Included observations: 73 after adjustments
 $PC = C(1) + C(2) * Y + C(3) * PC(-1)$
 Instrument specification: PC Y PC_{t-1}
 Constant added to instrument list

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	98.56585	64.20404	1.535197	0.1292
C(2)	0.661563	0.009941	66.55049	0.0000
C(3)	0.019047	0.014973	1.272056	0.2076
R-squared	0.984640	Mean dependent var	612.3836	
Adjusted R-squared	0.984202	S.D. dependent var	4304.712	
S.E. of regression	541.0682	Sum squared resid	20492837	
Durbin-Watson stat	2.189354	J-statistic	70.00000	
Instrument rank	4	Prob(J-statistic)	0.000000	

Source: Output of EViews7.2

Generally, higher value of MPC ratio in the region is signaling that larger spending in the present year results to a higher additional demand that may prompt more output or increase imports or lead to high inflation, it also implies a lower additional savings in the present period with potential diminishing effects on output on the supply side. The influence of foreign remittances on the economy as part of disposable income is a reflection in this behaviour. The coefficient of the lagged consumption has the correct sign as theoretically expected, but at 5 percent significance level, it is statistically insignificant. The positive sign of lagged consumption is consistent with the permanent income hypothesis by Friedman (1957). The theory states that consumption of an individual in any given period is not necessarily determined by income in that period, but income over his or her entire life time. This means that households accustomed to a certain standard of living do not adjust immediately with change in income. Therefore, households are able to save in the present times and spend (consume) in future. However, in EAC, the MPC ratio is high (0.66) implying that very little is saved for future consumption. Using the Keynesian approach, marginal propensity to save (MPS) =1-MPC, meaning that in EAC, only 0.44 percent of income is save which is in turn used for investment.

The intercept value (autonomous private consumption) in this study is positive as theoretically expected. This means that when income is zero or when remittances is zero or not sent, private consumption would be at US\$ 99 million. However, at 5 percent significance level, this value is statistically insignificant since the t-statistics values are less than the critical value of 1.96. The high adjusted R^2 (0.98) in Table 3 is an indication that the model fits the regression well. The study, therefore, concludes that there is a positive correlation between private consumption and income (income this study includes foreign remittances) leading to rejection of the null hypothesis that all coefficients are equal to zero. This implies that 98 percent of the variation in private consumption function in Equation (2) is explained by changes in income (which includes) foreign remittances. The coefficients of the lagged consumption and autonomous consumption are statistically insignificant implying that private consumption in EAC heavily depends on the present income (foreign remittances is part of the income).

The information in Table 3, further reveals that private consumption function in the study does not suffer from autocorrelation. Higher Durbin-Watson statistics suggest that the reliability of the estimates are not affected by serial correlation of the residuals. For 74 observations and two explanatory variables, the upper 5 percent critical Durbin Watson (d) value is 1.680. Since the observed (d) value of 2.18934 is above the upper limit, therefore, there is no evidence of positive autocorrelation. We, therefore, reject the null hypothesis that there is serial correlation in the residuals in the EAC data under study.

Investment:

The model performed quite well as theoretically expected, the value of the $MPI < 1$, this is because part of income is consumed. The study estimates the MPI for EAC at 0.32 as presented in Table 4. The MPI has the right sign as per the priori expectation and it is statistically significant at 5 percent significance level as demonstrated by the high t-statistics value. Given that foreign remittances only constitutes 1.9 percent of the total income; it therefore implies that the effect of remittances in the coefficient is only 1.9 percent. To get the effect of foreign remittances as proposed in methodology, we multiply 1.9 percent by 32 cents (0.019×32 cents) which gives 0.60 cents. Implying that an increase in remittances by 1 dollar, would increase investment in EAC by 0.60 cents. The null hypothesis that foreign remittances do not affect investment in the EAC region is, therefore, rejected and the alternative hypothesis is accepted, implying that increase of remittances increase investment in the EAC region even if it is by small margin.

Similar results were established by Glytsos (2005). The study by Glytsos estimated MPIs for Greece, Jordan, Morocco and Portugal at 0.13, 0.36, 0.39 and 0.29 respectively which are in agreement with Tansel & Yasar (2010). The study by Tansel & Yasar estimated MPI for Turkey at 0.33. Ondieng'a et al (2017) estimates MPI for Kenya and Tanzania at 0.31 and 0.32 respectively. In Palestine, Saad (2015) estimated MPI at 0.27 and Aitymbetor (2006) estimated MPI for Kyrgyzstan at 0.17. Similarly, MPI for Albania and Moldova were estimated at 0.14 and 0.38 respectively by Blouchoutzi & Christos (2014). However, unlike these studies, this particular study was able to separate the effects of foreign remittances in EAC from those of other forms of income.

The lagged capital accumulation coefficients have the right signs (negative) even if it is statistically insignificant. The model fits the regression well as demonstrated by high value of adjusted R^2 at 0.90 implying that in EAC, 90 percent of variation in investment is explained by the regressor income (which includes or is part of foreign remittances). The coefficient of the autonomous investment is negative and statistically insignificant meaning that it does not have any economic implication in the region.

Table 4: Two Stage Least Square Estimates of the investment model.

Dependent Variable: I
 Method: Two-Stage Least Squares
 Date: 05/27/17 Time: 19:00
 Sample (adjusted): 2 74
 Included observations: 73 after adjustments
 $I=C(1)+C(2)*Y+C(3)*K(-1)$
 Instrument specification: I Y K(-1)
 Constant added to instrument list

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-59.73438	81.21529	-0.735507	0.4645
C(2)	0.316450	0.012577	25.16033	0.0000
C(3)	-0.028540	0.039811	-0.716906	0.4758
R-squared	0.900446	Mean dependent var	177.2164	
Adjusted R-squared	0.897602	S.D. dependent var	2148.799	
S.E. of regression	687.6099	Sum squared resid	33096516	
Durbin-Watson stat	2.198186	J-statistic	70.00000	
Instrument rank	4	Prob(J-statistic)	0.000000	

Source: EViews 7.2 (2017)

The information in Table 4, further reveals that the data in investment regression in the study do not suffer from autocorrelation. Higher Durbin-Watson statistics suggest that the reliability of the estimates are not affected by serial correlation of the residuals. For 74 observations and two explanatory variables, the upper 5 percent critical Durbin Watson (d) value is 1.680. Since the observed d value of 2.198186 is above the upper limit, there is no evidence of positive autocorrelation. We, therefore, reject the null hypothesis that there is serial correlation in the residuals in the EAC data under study.

Import:

Just like the consumption and investment, the model performs well in EAC as theoretically expected. The coefficient of marginal propensity to import (MPM) is estimated at 0.30 as presented in Table 5. The coefficient has the correct sign and it is statistically significant at 5 percent level of significance. However, since foreign remittances only constitutes 1.9 percent of the total income, their impact on the coefficient is only 1.9 percent. To get the effect of foreign remittances as proposed in methodology, we multiply 1.9 percent by 30 cents (0.019x30 cents)

which gives 0.57 cents. This therefore, suggests that an increase in remittances by 1 dollar, would increase imports by 0.57cents. The null hypothesis that foreign remittances do not affect private import in the EAC region is, therefore, rejected and the alternative hypothesis is accepted, implying that increase of foreign remittances increases import in the EAC region.

Table 5: Two Stage Least Square Estimates of the import model.

Dependent Variable: M
 Method: Two-Stage Least Squares
 Date: 05/28/17 Time: 11:02
 Sample (adjusted): 2 74
 Included observations: 73 after adjustments
 M=C(1)+C(2)*Y+C(3)*Y(-1)+C(4)*M(-1)
 Instrument specification: M Y Y(-1) M(-1)
 Constant added to instrument list

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	41.38514	75.12978	0.550849	0.5835
C(2)	0.304907	0.011829	25.77711	0.0000
C(3)	0.032196	0.038872	0.828261	0.4104
C(4)	-0.114192	0.123382	-0.925512	0.3579
R-squared	0.908173	Mean dependent var	268.5786	
Adjusted R-squared	0.904180	S.D. dependent var	2048.137	
S.E. of regression	633.9962	Sum squared resid	27734633	
Durbin-Watson stat	2.116780	J-statistic	69.00000	
Instrument rank	5	Prob(J-statistic)	0.000000	

Source: EViews software version 7.2 (2017).

The findings in Table 5 are similar to the one established by Tansel & Yasar (2010) in Turkey where MPM was estimated at 0.16. Glytsos (2005) estimated MPM for Egypt, Greece, Jordan and Portugal 0.24, 0.14, 0.40 and 0.16 respectively. Ondieng’a et al (2017), estimated MPM for Kenya and Tanzania at 0.30 and 0.29 respectively. Similarly, Aitymbetor (2006) estimated MPM for Kyrgyzstan at 0.29. From the estimates, it is clear that the immediate concern of consumers in the EAC region is to increase their consumption (that obviously includes imported goods like cars and medicine).

The coefficients of the lagged imports ($M_{(t-1)}$) have the negative sign contrary to the priori expectation, however, it is statistically insignificant. The negative sign of the coefficient of the lagged imports implies that importation is based on the current income but not saving, hence, the

permanent income hypothesis does not apply, importation is for immediate use. This is clearly evidenced by the high MPM of 0.30 as compared to 0.16 established in Turkey and Portugal by Tansel & Yasar (2010) and Glytsos (2005) respectively. The high MPM ratios in the region, has a negative effect on the output. Import, generally, reduces output, the higher MPM ratios estimated in EAC is a clear indication that increase in income (remittances) could have a negative effect on the economy unless the imports are for investment purposes. These ratios are almost equal to MPI in these economies signaling negative effect. The positive sign for lagged income would be an indication of asset liquidation, but such a possibility is negligible and statistically insignificant at 5 percent significance level.

The information in Table 5, further reveals that the import function in the study does not suffer from autocorrelation. Higher Durbin-Watson statistics suggest that the reliability of the estimates are not affected by serial correlation of the residuals. For 74 observations and three explanatory variables, the upper 5 percent critical Durbin Watson (d) value is 1.709. Since the observed d value of 2.116780 is above the upper limit, there is no evidence of positive autocorrelation. We, therefore, reject the null hypothesis that there is serial correlation in the residuals in the EAC data under study.

The high value for adjusted R^2 in the three regressions is a sign that the models fits the regressions well; meaning that 98 percent, 89 percent and 90 percent variations are explained by the regressors in consumption, investment and import functions respectively. However, the high value of adjusted R^2 is a sign of the presence of multicollinearity in the data used in the estimation. Nevertheless, some coefficients in the regressions have correct signs and are individually statistically supporting the rejection of the null hypothesis that the variables are suffering from multicollinearity. Since, the objective is to estimate linear combination of these coefficients this can be done even in the presence of perfect multicollinearity (Gujarati & Porter, 2009). The study, choose "Do Nothing" approach of dealing with multicollinearity as expressed by Kennedy (1998), this is because multicollinearity is a data deficiency problem which we have no choice over, besides, not all the coefficients in the regression model are statistically insignificant. Moreover, even if we can not estimate one or more regression coefficients with greater precision, a linear combination of them can be estimated relatively efficiently.

Impact and Dynamic Multiplier for the Effect of change in Remittances by one dollar:

The reduced form equations express the endogenous variables as a function of all the predetermined variables in the model. They are also used to find the short-run or impact multipliers. The dynamic or impact multipliers can be derived from the final form equations for

the endogenous variables which are obtained by making substitutions for the dynamic terms. The information is presented in Table 6.

Table 6: Time Distribution of the Effects of a unit Change in Income on Endogenous variables (Impact and Dynamic Multipliers).

Variables	Impact Multipliers	Dynamic Multipliers			
	Year 1	Year 2	Year 3	Year 4	Long run
Consumption	2.0625	0.1196	0.0069	0.0004	2.1894
Investment	1.0000	-0.0570	0.0032	-0.0002	0.9460
Imports	0.9375	0.0019	0.0000	0.0000	0.9394
Output	2.125	0.0607	0.0101	0.0002	2.1960

Source: Authors using figures from Tables 3, 4 & 5

Table 6 presents information on the effects of a unit change in income on endogenous variables. However, as proposed under methodology, foreign remittances only constitute 1.9 percent of the income. In order to estimate the effect of a unit increase of foreign remittance on impact and dynamic multiplier, we multiply the income dynamic effects by 1.9 percent. This results are presented in Table 7. Therefore, an increase in remittances by 1 dollar would increase consumption in EAC through dynamic multiplier effects by 3.92 cents, 0.23 cents and 0.01 cents in the first, second and third year respectively with a long run effect of 4.16 cents. As expected, the impact effect is high on the first year and gradually declines over the years. Clearly, does not only foreign remittances affect private consumption positively in the short run, but in the long run as well.

Using the same approach, an increase in remittances by one dollar would increase investments by 1.9 cents in the first year and wears out in the second year as theoretically expected. It is, therefore clear that remittances have a positive effect in EAC leading to the rejection of the null hypotheses that foreign remittance does not have any effect on investment. Similarly, an increase of foreign remittances by 1 dollar through dynamic multiplier effect would increase import in EAC by 1.78 cents in the first year and reduces to zero in the second year. Output would increase by 4.04 cents in the first year and drastically reduces to 0.12 cents, 0.02 in the second and third

year respectively before reducing to zero in the subsequent years. The output would increase by 4.17 cents in the long run.

As expected, the impact and dynamic multipliers for imports are smaller than those for consumption in the region. This is because some goods and services consumed are imported and imports comes after some levels of consumption have been achieved. Changes in consumption, investment and imports is a reflection of changes in output brought about by changes in remittances. The dynamic multipliers for output are obtained by adding the multipliers for consumption and investment and subtracting that for imports.

The positive impact and dynamic effect of remittances on consumption and investment is consistent with altruism and self-interest theory (Lucas & Stark ,1985). The theory highlights that migrants remit money back home in concern of the welfare of the remaining family members especially during economic hardships and also as motive for investment. Essentially, remittances motivated by self-interest will tend to flow as a disguised capital into the receiving economy. The overall assumption is that remittances flow responds to real investment opportunities in the migrant's country of origin. With these empirical findings and the hypothesis of the study, we reject the null hypotheses (H_0) and conclude that foreign remittances do affect Private Consumption, investment, Imports, output and accept the alternative hypotheses (H_1) for EAC.

Table 7 reveals that the dynamic multipliers effect of a unit change in remittances is high in the first year and gradually declines in the subsequent years over a period of four years except in investment where it wears out in the second year when all other predetermined variables are held constant. It is, therefore, clear that the effect of foreign remittances on consumption, investment, imports and output is positive in short run and in the long run. It is also clear that, the dynamic multipliers are smaller than the impact multipliers. As theoretically expected, the impact of remittance on investment wears out in the second year. The gradual decline for consumption and import is in line with the Permanent Income Hypothesis which outlines the importance of life-time income spending distributed over time. This is evident from the positive coefficient of the lagged consumption in the consumption regression.

Table 7: Impact and Dynamic Multiplier for the Effect of change in Remittances by one dollar.

Variables	Impact Multipliers	Dynamic Multipliers			
	Year 1	Year 2	Year 3	Year 4	Long run
Consumption	3.91875	0.22724	0.01311	0.00076	4.1599
Investment	1.9	-0.1083	0.00608	-0.0004	1.7974
Imports	1.78125	0.00361	0.0000	0.0000	1.7849
Output	4.0375	0.11533	0.01919	0.0004	4.1724

Tansel & Yasar (2010), established similar results in Turkey where a percentage increase in income increased consumption, investment, import and output by 0.728 percent, 0.684 percent, 0.333 percent and 2.079 percent respectively. Similarly, Glytsos (2005) established that an increase in income by 1 percent, would increase output in Egypt, Greece, Jordan, Morocco and Portugal by 0.95 percent, 1.72 percent, 1.25 percent, 2.80 percent and 1.86 percent respectively in the first year and declined gradually over the years till the sixth year. Ondieng'a et al (2017) established that an increase of income by 1 dollar, would increase consumption by 2.536 and 0.816 dollars in the first and second year respectively in Kenya. In Kyrgyzstan economy, Aitymbetor (2006) established that an increase in remittances by 1 percent increased output by 2.3 percent. The gradual decline in variables over time is largely attributed to low MPCs and positive sign of the lagged private consumption coefficient in EAC. Glytsos estimated MPC for Portugal, Egypt, Greece and Jordan at 0.325, 0.334, 0.383 and 0.241 respectively. Tansel & Yasar(2010) estimated MPC in Turkey at 0.350. However, studies by Ondieng'a et al(2017), Tansel & Yasar (2010) and Glytsos (2005) did not separate the impact and dynamic multipliers of remittances on consumption, investment, import and output from that of income (GDP), therefore, this is the first study to demonstrate on how remittances affects these macroeconomic variables.

5. CONCLUSIONS AND RECOMMENDATIONS

This study is motivated by the uncertainties surrounding the effect of foreign remittances on private consumption, investment, import and output in EAC. From a theoretical perspective, remittances can contribute positively to growth by providing a stable source of foreign exchange and supporting domestic demand for both inputs and consumption goods, domestic savings and consequently investment in the long run. In EAC economies, remittances have played a significant role in reducing poverty through enhancing consumption even during times of crisis. The overall objective of the study was to investigate the effect of foreign remittances on private consumption, investment, import and output in EAC. Evidence provided in this study reveals that foreign remittances have a positive effect these macroeconomic variables in EAC region.

However, for remittances to have a high long term effect in the region, the study recommends that households to be encouraged to save more, this will reduce short term consumption as it reduces future consumptions. Savings could encourage future spending (over one's life time). To achieve this, the respective governments should encourage remittances through removal of barriers associated with the formal channels of remitting back. This will go a long way to discourage remittances through informal channels that does not have data records and which does not encourage saving. The major barrier is the cost of remitting money through financial intermediaries (World Bank, 2011).

To ensure sustainable investment in the region, the study recommends incentives to be put in place to encourage savings which would increase investment. The EAC governments to encourage the diaspora to invest in the region even when the host countries might give high rates or profits. This can be achieved through floating a diaspora bonds, provide good infrastructure in the domestic market. Encourage the formation of diaspora saccoes to take care of investments of the emigrants. And design policies to allow dual citizenship like it is the case in Kenya. This will encourages those who might have acquired citizenship in Europe or America to invest at home.

For sustainable growth, there is need to reduce MPC in the short-run including imported consumption goods and encourage savings. Saving will encourage investment which has good multiplier effects. Importation has negative effect on the output. Therefore, for remittances to have positive long run impact in the region, the respective governments should encourage savings which automatically reduces short term consumption. The positive effect of foreign remittances on consumption, investment and imports in EAC in the short run, could have effects on inflation levels and exchange rates. The study, therefore, recommends future studies to focus on its effect on inflation and exchange rates in the region.

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