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DETERMINANTS OF ECONOMIC GROWTH IN THE EAST AFRICAN COMMUNITY

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Abstract

Economic growth is essential for the achievement of the twin goals of a sustained reduction in unemployment and inflation. However East African countries have the challenge of raising their economic growth rates and eventually translating it to lower unemployment and poverty levels. It is with this regard that this research entailed investigating the major determinants of economic growth for Kenya, Tanzania, Uganda, Rwanda and Burundi. The study relied on the endogenous growth theory to assess the major determinants of economic growth using secondary data for the period 2000 to 2013. Both random effects and fixed effects unbalanced panel regression approaches were estimated. However, fixed effects regression model was adopted in the study since it was found to be appropriate after carrying out Hausman test. The findings showed a positive significant effect for FDI and M2 at 5% and 10% significant levels respectively on explaining cross country different economic growth rates. These results are consistent with the theories of economic growth and growth literature. The study recommends that relevant policies promoting FDI and financial deepening to be formulated and implemented so as to ensure sustained economic growth in East Africa Community Member states.

Keywords: Capital formation, East Africa Community (EAC), Economic growth, FDI's, financial deepening, human capital development, trade

INTRODUCTION

Economic growth has been the main subject of discussion for both developed and developing countries. The main questions taking the center stage being why then are some countries poor and others rich and what determines the rate of growth? This is due to sluggish economic growths in both developed and developing economies. Nkurunziza and Bates (2003) noted that economic growth rates are still not high enough to make a real dent in the pervasive poverty and enable developing countries to catch up with other developed nations since investments have remained subdued, limiting efforts to diversify economic structures and boost growth. Further, Mallick and Kumar (2002) specifically noted continued drop in capital formation suggesting that of the components of GDP, investment has been one of the slowest growing, a symptom of looming crisis. Most notably and what is also unusual is actually the phenomenon of economic growth, in terms of stagnation as it seems to be the norm during most of human history (Galor 2006). This makes it vital to understand why societies failed to grow until recently (Dalgaard and Strulik, 2015); if key mechanisms that hampered growth historically can be divulged to give important evidence as to why still some societies appear to stagnate or have low growth rates to this very day. Therefore, it is necessary to understand countries or regions economic circumstances that prevail and how they influence the current GDP per capita growth. Consequently, the aim of this study is to determine the major driving forces behind economic growth in the five East Africa Community (EAC) member countries; Kenya, Tanzania, Uganda, Rwanda and Burundi, with the assumption that such successful growth paths are determined by a unique set of variables as proposed by the endogenous growth theory. The specific objectives is thus to investigate the effects of gross capital formation, human development proxied by secondary school enrolment, technological innovation proxied by foreign direct investments (FDI's), trade, and effects of financial deepening proxied by remittances and broad money (M2) on economic growth measured by GDP per capita (GDPPC).

This study is of great value since it compares and exposes those factors which are critical in defining observed differences in EAC member countries per capita GDP growth. It provides justification for pursuing further policy reforms that promote economic growth in the EAC member countries. Specifically, it makes significant contributions to the Governments, Policy makers and investors by showing how the major economic determinants can be used to forecast and achieve long-term sustainable real per capita GDP growth rates which will help curb the problem of unemployment, poverty and uncertainty for investors. In addition, the study is also expected to add to body of knowledge of related and similar studies in the African Context as endogenous growth theory was revisited while incorporating financial deepening aspect and trade.

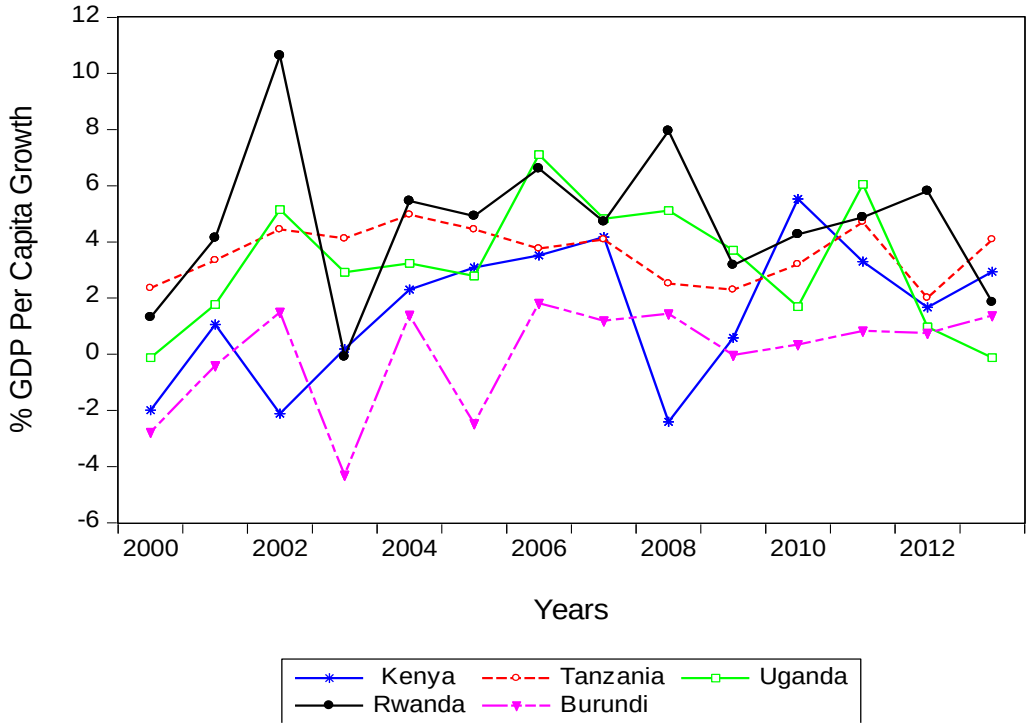
OVERVIEW OF ECONOMIC GROWTH IN EAST AFRICA COMMUNITY (EAC)

Economic growth is conventionally characterized by increases in GDP or real GDP per capita that occur over the long-term (Jackson & McIver 2001). In reality different nations have maintained different GDP per capita over long periods of time and these rates seem to be systematically related to various national features. Such features include: level of capital formation, human development and demographic changes, technological innovations in the countries, financial depth, trade openness and so forth. In most cases, economies that devote large shares of output to investments through capital formation, technological innovation, and embrace trade tend to have more GDPPC growth rates than the other nations that devote less output to these productive channels. Further, it is worth noting that there is a substantial variation in per capita incomes across countries with poor countries accounting for less than 5% of per capita incomes of the rich countries. The significant differences in growth rates across countries are also not constant overtime. Specifically East African countries have been having low real GDPPC which may be an indication of a looming crisis.

According to Loayza & Soto (2002) nations that grow at a faster pace for sustainable periods of time, have the ability to drastically reduce poverty, improve democratic and political stability, achieve greater quality in the natural environment, and minimize the volume of crime and violence. However, EAC member countries have had sluggish economic growths with annual GDP per capita growth between 2000 and 2013 varying from low to high rates: -2.4% and the highest 5.5% for Kenya, 2.0% and 4.9 % for Tanzania,– 0.1% and 7..1 % for Uganda, -0.09% and 7.9% for Rwanda, and -2.8% and 1.8% for Burundi as represented in Fig. 1.

As shown in Fig.1, the annual per capita GDP (GDPPC) growth rates fluctuate frequently with Rwanda generally having higher per capita GDP growth rates compared to the other countries and Burundi having relatively low GDPPC growth rates. Economic growth has therefore been a serious issue to the extent that it has called for strategic visions for EAC member countries such as vision 2030, vision 2035 and vision 2025, vision 2020 and Vision 2025 for Kenya, Uganda, Tanzania, Rwanda and Burundi respectively. All these strategic visions are inclined towards and emphasize on prosperity and global competitiveness which can only be achieved through economic growth and development. However, different economies normally have different drivers of economic growth which this study aims to investigate. It is with this regard that capital formation for investments and other set of variables that correlate with GDP per capita should be treated with seriousness they deserves and necessary policy recommendations be enforced to stimulate sustainable real economic growth that will go a long way to reduce poverty and promote employment.

Figure 1: Trends in Annual GDP per capita growth for EAC member countries between the period 2000 and 2013



Source: World Development Indicators (WDI) Database, 2015.

THEORETICAL FRAMEWORK AND MODEL SPECIFICATION

Theoretical review

Growth models began by classical economists; Adam Smith, Thomas Malthus, and David Ricardo. The classical economists' school of thought were pegged on the concrete conditions of their time as well as historical period economic and social events. Living in the 18th and 19th century, or during industrial revolution, they recognized that accumulation and productive investment of a part of social product is the main driving force behind economic growth and that under capitalism, it mainly takes the form of profit reinvestment. They focused on the relationship between the law of diminishing returns and population growth (Jackson & McIver 2001). The classical/pre-Keynesian models predicted that output is a function of capital, labor and land. Thus they postulated that output growth is determined by the population growth, increase in investment, land and the total labor productivity growth. Therefrom, the main problem of economic growth according to them was the explanation of the forces underlying the accumulation process.Afterwards there came the Keynesian growth models which were based on the transition of savings to investment and its multiplication effect. Harod began the

accelerator principle and Domar started the multiplication effect but they eventually came to the same conclusion that the rate of output growth is determined by national savings ratio.

The aggregate growth models were extended in the neoclassical models, with Solow's classic articles playing a leading role. Solow (1956) showed that the rates of saving and population growth, taken exogenously by assuming a standard neoclassical production function with decreasing returns to capital, determine the steady-state level of income per capita, which is exogenous. Solow therefore is considered the founder of traditional neoclassical theory, which assumes that the growth rate is determined by the rate of population growth and technical progress and savings. Both are external factors for growth, which is determined by the equation of production of the first degree. Depending on the equation of production of the first degree as follows; Where: Y = f (K, L), Y = GDP, K = Capital Stock, L = Employment

These exogenous neoclassical growth models have been extended in the late 1980s and early 1990s to endogenous growth models (Romer, 1990; Lucas, 2000). The endogenous growth models developed by Lucas–Romer challenged the old neoclassical model by emphasizing the role of endogenous factors (i.e., human capital stock and R&D activities) as the main engines of economic growth. While early neoclassical models assumed total factor productivity growth (or technical progress) as exogenously given, the newer endogenous growth models attributed this component of growth to the 'learning by doing' effect occurring between physical and human capital, which results in increasing returns to scale in production technology (Lucas, 2000). Paul Romer (Romer, 1990), established the endogenous growth model where y=AKL, is important component of the theory of development of developing countries. This theory assumes that the continued growth is determined by the production process, not by outside factors (Grandy, 1999). One of the most important drivers of this theory is the lack of response by the neo-classical theory about the reason for the different rates of economic growth among countries that have the same technological level. Modern theory also assumes increasing marginal returns on the size of production factors through the role of external effects of returns on human capital investment, which will generate improvements in productivity.

Growth therefore depends on savings and investment in human capital on one hand (Lucas, 2000), and investment in research and development on the other (Romer, 1990). In addition, it is argued that the free market leads to less than optimal level of capital accumulation in human capital and research and development. Therefore, the government may improve the efficiency of resource allocation through investment in human capital, and encouraging private investment in high-tech industries. Therefore an Endogenous growth theory implication is that policies which embrace capital formation, openness, competition, change and innovation will promote growth. The most distinctive difference between neoclassical exogenous and

endogenous growth theories is that the former assumes constant returns to scale whereas the latter generally assumes increasing returns to scale. The assumption of increasing returns to scale provides a possible way to long-run sustained growth in endogenous growth theories. These theories of endogenous economic growth stress the point that the opening up of investment opportunities under a liberalized market-friendly economy brings about high economic growth. Therefore this study was based on the endogenous growth theory wherefrom the variables were obtained.

Model specification

The variables that were used in this study were chosen based on their authenticity in empirical literature backed by growth theories and from the fact that local policy debates frequently revolves around them. Hence, the general model and variables used were based on endogenous model of economic growth augmented by financial deepening and trade as derived/ constructed below:

$G_t = f(A_t, L_t, K_t, FD_t, T_t)$, expressed mathematically in equation 1,

$G_{it} = \alpha_0 + \alpha_1 A_{it} + \alpha_2 L_{it} + \alpha_3 K_{it} + \alpha_4 FD_{it} + \alpha_5 T_{it} + \varepsilon_{it}$……equation 1

where "t" denotes time, G is the GDPPC growth rate which is a function of; technological innovation proxied by FDI denoted by A, Labor in terms of human capital proxied by gross secondary school enrolment denoted by L, gross capital formation denoted by K, FD denoting financial deepening and proxied by M2 and remittances and T denoting trade. All the independent variables were measured as percentages of GDP.

But

$K_{it} = K_{it-1} - \delta K_{it-1} + I_{it}$ …….....equation 2

Where δ is the depreciation rate of the capital stock and I_{it} is investment in each period t, and i stand for countries which are Kenya, Uganda, Tanzania, Rwanda and Burundi. Hence Equation 2 can be simplified further into equation 3 below,

$K_{it} = (1- \delta) K_{it-1} + I_{it}$ …….....equation 3

Substituting equation 3 above in equation 1 to provide a more comprehensive evaluation, it yields equation 4 below,

$G_{it} = \alpha_0 + \alpha_1 A_{it} + \alpha_2 L_{it} + \alpha_3 \{(1- \delta) K_{it-1} + I_{it}\} + \alpha_4 FD_{it} + \alpha_5 T_{it} + \varepsilon_{it}$…….....equation 4

Simplifying equation 4 above, we obtain the below multivariate model equation 5

$G_t = \beta_0 + \beta_1 A_{it} + \beta_2 L_{it} + \beta_3 K^*_{it-1} + \beta_4 I_{it} + \beta_5 FD_{it} + \beta_6 T_{it} + \varepsilon_{it}$ …….....equation 5

Where; $\beta_3 = \alpha_3 \{(1- \delta)$, δ is the depreciation of capital.

However since K^*_{it-1} is unobservable variable it was dropped/not estimated and Equation 5 can be transformed into below final estimable equation 6:

$G_t = \beta_0 + \beta_1 FDI_{it} + \beta_2 SSE_{it} + \beta_3 GCF_{it} + \beta_4 M2_{it} + \beta_5 PR_{it} + \beta_6 T_{it} + \varepsilon_{it}$ .....Equation 6

Where $\varepsilon_{it} = u_i + v_{it}$, ε_{it} is a random term comprised of the two parts, country specific effect u_i and v_{it} a random term.

v_{it} is IID N $(0, \delta_v^2)$, and the subscript (t) indexes time.

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ and $\beta_6 > 0$

G_t denotes GDP per capita growth, FDI denotes Foreign Direct Investment as a proxy for Technological innovation, SSE denotes Gross Secondary School Enrolment proxy for human capital, GCF is Gross capital Formation, M2 is broad money (Money and Quasi money) & PR denotes personal remittances used as proxies for financial deepening and T denotes trade. Note that all the independent variables were also estimated as percentages of GDP.

Therefrom, econometric model in (equation 6) was estimated.

METHODOLOGY

To find out the fundamental factors that define observed differences in economic growth rates among the 5 EAC member countries, Kenya, Tanzania, Uganda, Rwanda, and Burundi, annual data between 2000 and 2013 was obtained from secondary source (World Development Indicators database). The period chosen was due to availability of data and to help show the current trends on the variables under study. The following variables and proxy variables were used in the analysis: Per Capita GDP (GDPPC) growth as a proxy for economic growth, Capital formation as a % of GDP, broad money (M2 % of GDP) and personal remittances (% of GDP) as proxies for financial deepening, secondary school enrolment as a proxy for human capital development, FDI (% of GDP) as a proxy for technological innovation and trade as a % of GDP. It is worth noting that the proxies chosen were due to availability of data for most of the countries. Unbalanced panel data analysis approach was used in the analysis due because of unavailability of few data points for some analysis periods (cross-sections didn't have same number of observations).

Unbalanced panel data regression analysis involved estimating fixed effects model and Random Effects Model using E-views. Further check was done using Hausman test to determine which model between FEM and REM is appropriate or suitable to accept. Autocorrelation and normality/residual check was also considered to enable results not to be biased and be consistent. The data's reliability was tested using measure of Goodness- of-fit R^2 and F statistic probability values.

EMPIRICAL RESULTS AND DISCUSSIONS

Descriptive Analysis

Table 1: Individual Sample Descriptive Statistics for EAC region

STATISTIC	GDPPC	FDI	SSE	GCF	M2	PR	TRADE
Mean	0.026	0.020	0.272	0.211	0.252	0.020	0.446
Median	0.029	0.014	0.253	0.214	0.230	0.018	0.458
Max.	0.106	0.066	0.670	0.329	0.413	0.068	0.645
Min.	-0.043	0.000	0.097	0.028	0.161	0.000	0.210
Std. Dev.	0.027	0.020	0.141	0.065	0.076	0.018	0.099
Skewness	-0.04	0.70	0.96	-0.63	0.90	0.58	-0.37
Kurtosis	3.57	2.25	3.32	3.52	2.52	2.40	2.50
Jarque-Bera	0.972	7.338	8.395	5.37	8.96	4.72	2.31
Probability	0.615	0.025	0.015	0.07	0.01	0.09	0.31
Observations	70	70	53	70	62	65	70

Table 1 shows that GDP per capita (GDPPC growth) for all the EAC member countries grew at an average of 2.6% between 2000 and 2003. The maximum GDPPC growth in the region ever experienced between 2000 and 2013 was 10.6% by Rwanda while the minimum was -4.3% by Burundi, and the negative signifies a decline in growth by 4.31%. The variation of the growth was 2.66% and it's JB probability (0.615 which is greater than 0.05) was an indication that GDPPC growth was normally distributed.

Table 1 further depicted average FDI's to be 2.0% in the region.The maximum was 6.6% by Tanzania while the Burundi had a minimum of 0.0000013% FDI in 2002. Standard deviation or spread of FDI was 2. Further, FDI in the region was not normally distributed (it's JB p- value of 0.025 is less than 5%). On the other hand,only 53 observations for secondary school enrolment were analyzed as opposed to the standard 70 obseravations. This is because Tanzania and part of Burundi's data were unavailable. The average secondary school enrolment (SSE % gross) in the EAC region was 27.2% and median 25.3%.The maximum enrolment was 67% by Kenya in 2013 while the least was 10% by Burundi in 2013. It's JB P-value of 0.015 was less than 0.05 indicating that SSE was not normally distributed.

Further, Gross capital formation (GCF) had a mean of 21.1% in the region, and a median of 21.4% according to the same table 1. Tanzania had maximum GCF of 32.9% while Burundi had the least, 2.78%.The standard deviation which measures spread was 6.5. GCF

Jarque-Bera probalility value of 0.07 which is grater than 0.05 is also an indication that the distribution was normally distributed.

Moreover, table 1 depicts observed and analyzed values of broad money (M2) were 62 and not 70 because of unavailability of data for Rwanda between the perion 2006 to 2013. M2 had an average of 25.2% and median 23%. The maximum M2 in the region was 41.3% by Kenya in 2013 while the minimum M2 value was 16.1% by Uganda in 2001. Standard deviation for M2 was 7.6. The existence of Jarque-Bera p-value of 0.01< 0.05 further indicates that M2 is not normally distributed. Personal remittances (PR) had a mean of 2% in the EAC region and a median of 1.8% out of the available 65 observations.The maximum remittance as a percentage of GPD was 6.8% by Uganda while the minimum was 0.0009% (approximately 0) by Burundi. The P-value of JB (0.095 >0.05) was an indication that personal remittances is normally distributed.

In addition, trade, as a percentage of GDP, had a mean of 44.6% as shown in table 1. This is an indication that trade contributes a larger percentage of GDP in EAC compared to the other variables. The maximum trade as a percentage of GDP was 64.5% by Kenya in 2005 while the minimum was 21% by Burundi in 2001.Trade had a standard deviation of 9.9, suggesting high variability in trade in the EAC member countries. The JB probability value statistic of 0.3, which is greater than 0.05, is an indication that the distribution of trade values is normal.

Correlation analysis

Table 2: Correlational Matrix.

	GDPPC	FDI	SSE	GCF	M2	PR	TRADE
GDPPC	1.00						
FDI	0.40	1.00					
SSE	-0.25	-0.12	1.00				
GCF	-0.06	0.44	0.09	1.00			
M2	-0.36	-0.35	0.88	-0.08	1.00		
PR	0.07	0.43	0.14	0.11	0.05	1.00	
TRADE	-0.23	0.02	0.77	0.33	0.82	0.15	1.00

Table 2 is important as it shows the strength of association between variables. It shows correction of variables that will be regressed as depicted in (equation 6) in the model specification section. Two independent variables with a high correlation of above 0.75 is an

indication that the variables are closely linked and may cause multicolinearity problems if they are regressed in the same model. According to Table 2, the highest correlation that exists is between M2 and SSE which is 0.88. The high correlation means that both M2 and SSE should not be regressed in the same model. M2 and trade also have a high correlation of 0.82 followed by a correlation of 0.77 between trade and SSE. The remaining correlations between independent variables are all less than 0.75, hence the independent variables are not highly correlated and can be jointly regressed except for the highly correlated variables SSE, M2 and trade. Therefrom different models for unbalanced panel regression were analyzed as elaborated in the following sub-section.

Unbalanced Panel Regression Models

Both Fixed Effects Model (FEM) and Random Effects Model (REM) approaches to panel data analysis was carried out using E-Views 8.1 software. Random effects model posits that the country-specific effects (random effects) are uncorrelated with the explanatory variables. This assumption was tested using Hausman test. On the other hand, the fixed-effects estimates were calculated from differences within each country across time. Table 3 shows the summary of the estimated regression results for the different models.

Table 3: Regression Results for FEM and REM

	Fixed Effects				**Random Effects**		
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 1**	**Model 2**	**Model 3**
Constant	-0.04	0.02	-0.04	-0.04	0.05	0.05	0.01
	(-1.17)	(1.42)	(-1.50)	(-0.76)	(2.88)***	(3.47)***	(0.76)
FDI	0.31	0.86	0.23	0.86	0.51	0.65	0.40
	(0.91)	(2.18)**	(0.76)	(1.73)*	(3.11)***	(3.28)***	(2.37)**
GCF	-0.07	-0.12	0.02	-0.17	-0.09	-0.11	-0.02
	(-0.86)	(-0.94)	(0.19)	(-1.00)	(-1.60)	(-1.60)	(-0.32)
PR	-0.02	0.05		0.37	-0.19	-0.22	
	(-0.04)	(0.14)		(0.78)	(-1.22)	(0.21)	
M2	0.30		0.27	0.17	-0.03		-0.07
	(1.99)*		(1.68)*	(0.62)	(-0.66)		(-0.87)
TRADE			-0.02	0.017			0.06
			(-0.28)	(0.16)			(0.86)
SSE		0.04		0.08		-0.029	
		(0.59)		(0.95)		(-1.2)	

Table 3….

R squared	0.36	0.45	0.41	0.43	0.20	0.21	0.17
Adj. R-Squared	0.25	0.34	0.32	0.25	0.13	0.14	0.10
F- statistic	3.31	4.21	4.51	2.37	3.18	3.02	2.88
	(0.004)	(0.0009)	(0.0003)	(0.032)	(0.02)	(0.028)	(0.03)
Cross sections Effects							
KEN	-0.046	-0.019	-0.037	-0.0476			
TZA	0.013	-0.015	0.013	-0.0003			
UGA	0.018	-0.009	0.018	0.0017			
RWA	0.042	0.027	0.045	0.0579			
BDI	-0.008	0.001	-0.013	0.0172			
DW	2.24	2.47	2.30	2.47	1.95	1.7	1.68
Hausman test					11.83	17.9	21.12
					(0.019)	(0.0013)	(0.0003)

*** ** * represent significance at 1%, 5% and 10% significance levels respectively. t values for the coefficients are in brackets. P-values for fixed effects/Random effects F-test and Hausman test statistics are also in brackets. DW= Durbin Watson test; FDI= Foreign Direct Investment; GCF= Gross Capital Formation; PR= Personal Remittances; M2= broad money (Money and Quasi money); SSE= Secondary School Enrolment; KEN= Kenya; TZA= Tanzania; UGA. = Uganda; RWA =Rwanda and BDI= Burundi

Table 3 shows results for different models of economic growth since some variables were found to have high correlation values meaning that they may cause multicolinearity problems if they are regressed together. Model 1 thus comprised of (FDI, GCF, PR and M2); Model 2 had (FDI, GCF, PR and SSE); Model 3 had (FDI, GCF, TRADE and M2) while for Model 4 we had (FDI, GCF, PR, M2, TRADE and SSE), all the variables to test whether indeed they can all be regressed together. However Model 4 was not tested for Random Effects since to test for Random effects the number of cross sections need to be more than the number of variables regressed.

Discussions and Interpretation of results

According to table 3, in investigating the determinants of GDPPC growth, fixed effects model 1 comprising of (FDI, GCF, PR and M2) was regressed. In Model 1 trade and SSE were exempted due the high correlation effects they were found to have in relation to M2. Fixed effects Model 1 generated from the estimation depicted a positive relationship between FDI, M2

and the independent variable GDPPC growth. However M2 was the only variable found to be positive with coefficient of 0.3 and significant (at 10% level) in influencing GDPPC growth. This means that when M2 increases by 1%, economic growth with increase by 0.3%. PR and GCF showed negative insignificant effect. R squared for model 1 was 36% meaning the variables in the model explain only 36% of the variations in GDPPC growth and 74% are unexplained by the model. Durbin Watson (DW) of 2.24<2.5 also implies that model 1 has no autocorrelation. On the other hand, Random Effects estimation for model 1 showed constant term and FDI to be positive and significant at 1% significance level while the rest of the variables (GCF, PR, and M2) were insignificant. However Hausman test proved that Fixed effects estimation for model 1 was more appropriate than the Random effects regression.

In model 2, GDPPC, FDI, GCF, PR, and now SSE instead of M2 were regressed. The fixed effects model 2 showed that all variables regressed had positive coefficients except GCF which had negative coefficient. However, only FDI with coefficient of 0.86 was found to be significant at 5% level of significance, the rest of the variables were insignificant in fixed effects model 2.This implies that a percentage change in FDI will cause a 0.86 increase in economic growth. In the case of Random effects model 2, still the constant term and FDI were found to be significant at 1% level. However when Hausman test was done for model 2, random effects was still found to be inappropriate and fixed effect was thus preferred. It's worth noting that model 2 had an R squared of 45% which is more than the r squared for model 1. The adjusted R squared (0.34) for model 2 was also greater than the adjusted r squared for model 1(0.25). DW for model 2 was 2.46 < 2.5 hence still there was no serial correlation. From the model 2 results, we can deduce that it is a better fit compared to model 1 since 45% of the variations in GDPPC are explained by the independent variables in the model, only 55% are unexplained.

Further, model 3 was estimated to show the effects of FDI, GCF, trade and M2 on GDPPC growth. Fixed effects model 3 showed that FDI and M2 had positive effects on GDPPC growth. However only M2 (broad money) with coefficient of 0.27 was significant in contributing to economic growth. The other variables GFC and Trade had negative impact on GDPPC growth and were insignificant. Model 3 had an R squared of 40% which is still less compared to model 2 R squared of 45%, but more than model 1 R squared of 36%. DW of 2.3 for model 3 also meant that the model had no serial correlation. Random effect for model 3 was also estimated and FDI was the only variable found to be significant in influencing GDPPC. Hausman test however still proved that fixed effects model 3 was more appropriate than random effects model 3.

The last Model 4 in table 2 included all variables (GCF, FDI, PR, TRADE, M2, and SSE) to investigate their effects on GDPPC growth. All the variables except GCF had positive

coefficients meaning that they have positive impact on GDPPC. However, among all the variables regressed only FDI with coefficient of 0.86 was significant at 10% level in affecting economic growth rates (GDPPC growth) in the EAC region. All the other variables had insignificant effects on GDPPC. Durbin Watson for model 4 was 2.5, implies existence of low serial correlation among the variables. R squared of 43% for model 4 meant than 43% of the variations in GDPPC was explained by the model.

In conclusion and with regard to table 2, Fixed effects model 2 (GDPPC, FDI, GCF, PR, SSE) was found to be a better fit since it had the highest R squared of 45% and had no serial correlation. It also had the highest adjusted R –squared of 0.34 compared to all the other models. Model 2 F- statistic was also significant meaning the variables in model 2 can be jointly regressed to show their effects on GDPPC growth. Furthermore, the P- values in model 2, table 3 showed that only FDI with a coefficient of 0.86 had a significant effect on GDPPC in EAC. This concurs with Ndambiri (2012) findings that FDI has significant influence on the Economies growth. The significance of M2 also in model 1 agrees with (Mohsin, 2000) findings that financial depth is significant in explaining cross country economic growth rates.

CONCLUSIONS AND POLICY IMPLICATIONS

The general objective of this research was to find out the major determinants of economic growth in EAC. It investigated the linkage between gross capital formation (GCF), trade, financial deepening proxied by personal remittances (PR) and broad money (M2) technological innovation proxied by FDI, human capital development (proxied by SSE) and economic growth proxied by GDP per capita growth (GDPPC). However the study was limited by unavailability of data on tertiary enrolment and M3 which are more exhaustive indicators for Human Capital development and Financial deepening respectively. However, secondary school enrolment and M2 were used as proxies instead of dropping the variables completely. The unbalanced panel FEM across the 5 countries revealed the following results; FDI and M2 were found to have positive significant influence on explaining the cross country different economic growth rates in the region at 5% and 10% level of significance. The probability of F statistic showed that the variables can be jointly regressed and the R squared of 45% for fixed effect model 2 was the highest compared to all the other models, indicating that the model is better fit compare to the other models. This implies that though the percentage of FDI's in EAC region is low, an average of 2%, it bears a great potential in promoting economic growth among the 5 EAC countries.

In conclusion FDI results to spillovers and technological innovations which ultimately lower production cost thus positively affect economic growth, financial deepening is important

as well since it shows availability of more liquid money hence more opportunities exists for continued and increased economic growth since M2 was also significant. Therefore policies and strategies that promote FDI and financial deepening should always be adopted to promote economic growth in EAC region as these two variables were significant in explaining the different cross country economic growth rates. Side by side and due to scant cross country studies on to what extent do different sectors, such as health, agriculture, manufacturing and so forth, influence economic growth, there is need to do further research on cross country sectoral basis especially for EAC in order to help channel funds and Foreign direct investments to the most productive sectors in the EAC region to spur economic growth.

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