

## Research Article

### Growth Impact of Foreign Direct Investment in the COMESA Region: Does Infrastructure Development Matter?

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**Abstract:** Using country-level panel data, this study investigates the impact of foreign direct investment on the gross domestic product per capita in the Common Market for Eastern and Southern Africa region over the 2000-2015 period. The estimates are generated using the one-step generalized method of a moments-difference estimator. The study found that foreign direct investment exerted a negative while quality development of infrastructure has a positive impact on economic growth in the region. In addition, the quality development of infrastructure has a positive effect on the ability of the region to absorb and benefit from the spillovers of foreign direct investment. The findings suggest that the states of the region should target to attract foreign direct investment which complements economic growth and improve the quality development of infrastructure so as to realize positive economic growth from the investment.

**Keywords:** COMESA, economic growth, foreign direct investment, generalized method of moments, infrastructure

## INTRODUCTION

Foreign Direct Investment (FDI) is defined as an investment made by an investor to acquire a lasting interest of management of 10% or more of voting stock and equity shares in a business enterprise with operations in an economy different from that of the investor (Mwilima, 2003; World Bank, 1996). Foreign direct investment is in forms of brick and mortar investment and merger and acquisition (M&A), which involves the acquisition of existing interest as opposed to a new investment. FDI also take the form of international joint ventures related to mergers<sup>1</sup>. FDI is further classified into market-seeking, resource-seeking and efficiency-seeking types (Ajayi, 2007).

FDI is associated with a positive contribution to the economic growth in recipient countries. Hayami (2001) and Todaro and Smith (2003) argued that FDI could close the gap between desired levels of investment and savings mobilized from domestic sources, increase tax revenues, improve skills of management, technology and workforce skills in recipient economies. Additionally, FDI may include the acquisition of modern technology, creation of employment opportunities, development of human capital, improved integration of foreign trade, complement domestic investment, generation of revenue, introduction of

modern and efficient processes, impeccable skills of management and know-how in the local market, employee training, improved foreign production networks and improved access to large markets (Ajayi, 2005; Jenkins and Thomas, 2002; Mwilima, 2003; World Bank, 2000).

On the other hand, FDI may create inadequate employment opportunities and lead into limited capital formation, crowd-out local investment, lead to balance of payments challenges and create the enclaves economy (Mwega and Ngugi, 2007; Ugochukwu *et al.*, 2013). Firebaugh (1992) added that foreign firms may fail to encourage entrepreneurship in the domestic economy; generate little revenues through taxes; repatriate profits to parent country instead of reinvesting the same in the local economy; develop limited forward and backward linkages with domestic firms; and can utilize capital-intensive techniques of production that are inappropriate in the domestic countries.

Despite these advantages policy analysts and researchers have not accorded considerable attention to the relationship between FDI and economic growth in developing countries.

The inflow of FDI has been on the increase in Africa and sub-Saharan Africa in general and the COMESA region in particular. According to the data

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from the United Nations Conference on Trade and Development (2017) the net FDI stocks as a share of GDP averaged 29.0% over the 2000-2015 period rising from 21.0% in 2000 to 36.4% in 2014 before falling to 27.9% in 2015. The net FDI stocks were not homogeneously distributed within the COMESA region as much of the investment was attracted by the resource-rich economies. Out of the total FDI net stocks received in the region over the 2000-2015 period, Egypt accounted for the highest net FDI stocks, followed by Sudan, Libya, Zambia, Uganda and Ethiopia (United Nations Conference on Trade and Development (UNCTAD), 2017).

Africa has also experienced fast growth since 2000 with sub-Saharan African region being the third fastest growing region (5.59% per annum) after emerging markets and developing economies (5.98%) and developing Asia (8.39% per annum) (International Monetary Fund, 2017). The COMESA region experienced high economic growth rate since 2000, with the highest growth rates of 3.9% in 2007 and 8.3% in 2012 (International Monetary Fund, 2017). The region's GDP per capita growth rate rose from an average of 0.46% in 2000 to 2.79% in 2015. Overall, the region experienced an average real GDP per capita growth rate of 1.9% between 2000 and 2015. This is slightly higher than the GDP growth of 1.8% for the advanced economies during the same period. Finally, many member countries of the region are the fastest growing in Africa (International Monetary Fund, 2017)<sup>2</sup>.

However, the growth impact of the increased FDI in the region is not well known and documented. To the best of our knowledge, there are no similar studies conducted in the region in the past and previous regional empirical studies. In our empirical review, we did not find studies that have used all the COMESA countries in their analysis. Some of the studies that have analysed some of the countries in the region include Asiedu (2002), Babatunde (2011), Rungqu (2014), Jugurnath *et al.* (2016), Ndoricimpa (2009) and Seetanah and Khadaroo (2006). Further, empirical evidence from these studies suggest that the growth impact of FDI is conflicting. The results shows that the impact is either positive, negative or even indeterminate. For instance, Jugurnath *et al.* (2016), Mutenyo (2008), Ndoricimpa (2009) and Seetanah and Khadaroo (2006) reveal that FDI exert a positive impact on the economic growth while Agbloyor *et al.* (2014), Bos *et al.* (1974), Prebisch (1968), Saltz (1992) and Singer (1950) found FDI to have a negative effect on growth. Alternatively, other authors, including Agbloyor *et al.* (2016), Carkovic and Levine (2002) and De Mello (1999) find that FDI has no impact on economic growth of recipient economies.

Additionally, empirical evidence show that the growth impact of FDI is dependent on quality development of infrastructure. They include Asiedu (2002), Babatunde (2011) and Rungqu (2014), who

showed that infrastructure has a positive effect on the growth impact of FDI.

It is thus clear that empirical evidence on the effects of FDI on economic growth provides conflicting results. One of the explanations to justify the controversy of the empirical evidence on the effects of FDI on GDP per capita growth is dependent on the human capital development and other absorptive capacity measures including the technology gap, the development of the financial sector, infrastructure and quality of institutions, among others. Additionally, the host country requires to reach a minimum threshold of such absorptive capacity, before benefiting from the effects of foreign direct investment on growth.

This study is aims at establishing the growth effect of FDI in all the nineteen countries of the COMESA region over the time period 2000-2015. The study tests the hypotheses that increased inflows of FDI exert a positive impact on the GDP per capita and that quality development of infrastructure enhances the growth effect of FDI in the COMESA region. The methodology involved use of dynamic panel data analysis and employing the one-step Generalized Method of Moments (GMM) estimation technique suggested by Arellano and Bond (1991). The results of this study will add to the body of scholarly research in this area.

## SELECTED LITERATURE REVIEW

FDI can promote economic growth in several ways. For example, De Mello (1999) and Kim and Seo (2003) proposed that, on one hand, FDI can affect GDP per capita growth of an economy through accumulation of capital by introducing new products and exotic technology, a viewpoint held by neoclassical economists. According to standard neoclassical growth models, countries with low domestic savings attract FDI to help in the process of accumulation of capital. However, the approach suggests that diminishing returns to physical capital occur and lead to limited short run growth effects of FDI.

On the other hand, FDI can promote economic growth via augmentation of the knowledge stock in the host economy through knowledge transfer. This viewpoint is held by endogenous growth theorists who believe that FDI can promote growth both in the long-run and short-run. Endogenous growth theory suggests that FDI facilitates the use of local raw materials, introduces modern management practices, brings-in new technologies, helps in financing current account deficits, increases the stock of human capital via on the job training and labor development and increases the investment in research and development. Theoretically, therefore, FDI, can play a key role in economic growth via increasing capital accumulation and spillovers or progress of technology (Herzer *et al.*, 2008).

Many researchers, including De Mello (1997), Seetanah and Khadaroo (2006), Mutenyo (2008) and Jugumath *et al.* (2016) have found direct positive effect of FDI on growth of GDP per capita of host economies.

On the other hand, Agbloyor *et al.* (2016), Borensztein *et al.* (1998) and Carkovic and Levine (2002) found that FDI has an indeterminate effect on the GDP per capita growth.

In contrast, Prebisch (1968) and Singer (1950) argued that the host economies of foreign direct investment do not obtain large benefits from this investment because most FDI benefits are shifted to the parent country of the multinational corporations. Bos *et al.* (1974) advanced the view that FDI adversely affects the rate of growth due to price distortions of factors of production caused by protectionism, monopolization of the market and depletion of natural resources. However, Bos *et al.* (1974) added that FDI raises the level of investment and perhaps the productivity of investments as well as the consumption in the host country. Saltz (1992) also concluded that foreign direct investment has an adverse effect on growth. Similarly, Agbloyor *et al.* (2014) found that FDI had a negative impact on economic growth.

The impact of infrastructure investment on economic growth has obtained a lot of attention over the years since the research work of Aschauer (1989). The development of high quality infrastructure is believed to contribute independently to economic growth and is an important condition for FDI to produce growth effects in a host economy (Tondl and Prüfer, 2007). Further, Pigato (2000) added that an efficient communications system and good transportation links within and outside the country is essential to make a nation attractive to foreign investors. A similar view is held by The World Economic Forum (2017) who argues that widespread and efficient infrastructure is crucial for ensuring that the economy functions effectively, as it determines the location and the types of economic activities or sectors that can come up within a country.

Many other empirical studies of economic growth including Babatunde (2011), Munnell (1992), Rungqu (2014) and Sanchez-Robles (1998) identify infrastructure as a key driver of growth. Munnell (1992) argued that good infrastructure can raise the economy's productive capacity by growing the level of resources and stimulating the existing resources productivity. Kinishita and Lu (2006) and Yamin and Sinkovic (2009) observed that good infrastructure is both a driver of FDI and a precondition for positive FDI spillovers in the host country. Kinishita and Lu (2006) established that technology spillovers through FDI occur only when the host economy achieves a certain level of infrastructure development. Further, they pointed out that the host economy benefits less from enticing FDI if development of infrastructure reduces below the critical

level. However, empirical studies on the role of infrastructure on the effect of FDI is missing in the literature. This study seeks to close this gap.

Rungqu (2014) in a study of 27 developing countries found a significant and positive relationship between Information Communication Technology (ICT), power and transport infrastructure and FDI inflows. The author further found that FDI has a positive and significant relationship with economic growth. Khadaroo and Seetanah (2010), noted that infrastructure should improve the investment climate of FDI by reducing the cost of investment required from foreign investors to increase their rate of return.

Babatunde (2011) in a study for 42 sub Saharan countries found that FDI and infrastructure are significant and positively related. The author noted that absence of infrastructure may lead to unattractiveness to FDI inflows, as more investment will be required for development of infrastructure. Asiedu (2002) in an analysis 34 African countries over the period 1980-2000 using the number of telephones per 1,000 population to measure infrastructure development found that countries that improved their infrastructure were rewarded with more investments. The study estimated that a one-unit increase in infrastructure led to a 1.12% increase in FDI/GDP in the 1980s. A further study by Asiedu (2004) found relative bigger declines in power and transport infrastructure and lesser increase in ICT infrastructure resulted in the declines of sub Saharan countries' share of FDI into developing countries. In a similar study, Bellak *et al.* (2009) found that information communication technology is more significant than transport and electricity generation capacity in Central Eastern European Countries. A significant and positive impact of infrastructure on FDI inflows was found in Malaysia in a study by Abu Bakar *et al.* (2012) on the determinants of FDI on Malaysia.

In a study to empirically examine the relationship between infrastructure development and FDI inflows at the province level in Indonesia by using panel data of 30 provinces over the sample period of 2000-2009, Fitriandi *et al.* (2014) found that infrastructure development promotes FDI inflows. In addition, the analysis revealed that provinces with small-sized government, which is measured by government expenditure, attract more FDI inflows.

Wekesa *et al.* (2017) in the study to determine the effects of transport, energy, communication and water and waste infrastructure development on FDI inflows in Kenya, found that transport infrastructure, communication infrastructure, water and waste infrastructure, exchange rate, economic growth and trade openness have a positive effect on FDI inflows. Further the study found that energy infrastructure has a positive but insignificant effect on FDI inflows while labour costs and insecurity have a negative effect on FDI inflows although the effect is insignificant.

In a study on FDI and neighbouring influences, Jordaan (2010) found a positive and significant relationship between good-quality and well-developed infrastructure to the productivity potential of investments in a country and therefore stimulates FDI flows towards the country. These findings were similar to those of Asiedu (2002). The study, further found that the measure only captures the availability of infrastructure not its reliability.

A competitive and high quality infrastructural system is believed to enhance the absorptive capacity of a host economy. However, there are many measures of the development of quality infrastructure used in the literature. They include production of electricity, consumption or transmission and distribution losses and the ratio of paved roads (Ayanwale, 2007; Khan and Bamou, 2007), public investment to GDP ratio (Barro, 1990; Mwege and Ngugi, 2007), telephone densities in host economies and the number of fixed telephone lines (Bouiyour, 2003), among others. However, most of these proxy measures capture particular aspects of infrastructure only. A better measure of infrastructure should therefore capture as many aspects of the variable as possible. Consequently, this study uses the development of quality overall infrastructure indicator scores reported in the The Global Competitiveness Report by the World Economic Forum. This indicator measures the development of competitive overall infrastructure, roads, railroads, sea ports, air transport, electricity supply and availability of airline seat kilometres, fixed telephone lines and mobile telephone subscriptions. This indicator is preferred as it captures a wide range of aspects of infrastructure, especially transport, electricity supply and communications.

The World Economic Forum (2017) argues that competitive, efficient and effective transport systems, such as high quality roads, ports, railroads and air transport enable investors to move their commodities to the market in a timely and secure way and facilitate the mobility of labour. Supply of clean electricity energy that is also free from shortages and interruptions allow the factories and businesses in the economy to work unimpeded. Additionally, an extensive and efficient network of telecommunications allows for a rapid and free flow of information, which raises the overall efficiency of the economy by ensuring that businesses communicate and economic actors make informed decisions. Thus, development of quality overall infrastructure determines the level of productivity of a country and sets a high prosperity level that can be achieved by an economy.

It is clear that empirical evidence on the effects of FDI on economic growth provides conflicting results. One of the explanations to justify the controversy of the empirical evidence on the effects of FDI on GDP per capita growth is that, the effect of FDI on GDP per capita is dependent on the quality development of infrastructure. Additionally, the host country requires to

reach a minimum threshold of such absorptive capacity, before benefiting from the effects of foreign direct investment on growth.

The foregoing literature review suggests that, in order to obtain the benefits of FDI, the recipient country require minimum threshold of quality development of infrastructure.

As such, while the theoretical literature points out that FDI has positive growth impacts, the empirical evidence gives conflicting outcomes. Additionally, regional empirical studies that examine the impact of FDI on the economic growth in the COMESA region are limited.

## METHODOLOGY

**Data:** This study use annual panel data covering the period between 2000 and 2015 for countries found in the COMESA region, namely, Burundi, Comoros, Djibouti, Democratic Republic of Congo, Egypt, Eritrea, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Sudan, Swaziland, Uganda, Zambia and Zimbabwe. The data is drawn from different sources and compiled to suit the analysis.

The data on the GDP per capita, inflation and public debt was obtained from the International Monetary Fund, World Economic Outlook reports, while the data on domestic investment-represented by gross capital formation, was gotten from the World Bank, World Development Indicators.

Finally, the data on the human capital development was obtained from the United Nations Development Programme (UNDP) and Human Development Index (HDI) reports; while the data on infrastructure was gotten from the World Economic Forum and Global Competitiveness Report.

**Theoretical framework:** In order to investigate the impact of growth impact FDI in the COMESA region, the theoretical growth model is constructed following Kitonyo (2018) to obtain Eq. (1):

$$Y_{i,t} = A_{i,t} L^{\alpha}_{i,t} K_D^{\beta}_{i,t} K_F^{\theta}_{i,t} \quad (1)$$

where,

$Y$  = The flow of output

$A$  = The total factor productivity

$K_D$  = The domestic investment

$K_F$  = FDI

$L$  = The labor force

$\alpha$  = The output changes to labor force changes

$\beta$  = The output changes to domestic investment changes

While  $\theta$  represents the changes in output to changes in FDI.  $\alpha$ ,  $\beta$  and  $\theta$  are assumed to be less than one to imply diminishing returns to each factor input. The subscripts  $i$  and  $t$  represent the cross-sectional

member countries of the COMESA region and time period, respectively.

Taking the logarithms of equation 1 obtains a dynamic production function, expressed as shown in Eq. (2):

$$Y_{i,t} = \tau + \gamma_1 L_{i,t} + \gamma_2 K_{Di,t} + \gamma_3 K_{Fi,t} + \varepsilon_{i,t} \quad (2)$$

Equation 2 is expanded to include other explanatory variables of growth, denoted by  $W^3$ , infrastructure ( $Z$ ) and interaction term between the quality development of infrastructure ( $Z$ ) and FDI,  $Z*K_F$ . The addition of the interaction terms follows Elboiashi (2011)<sup>4</sup> and Kitonyo (2018)<sup>5</sup>:

$$Y_{i,t} = \tau + \gamma_1 L_{i,t} + \gamma_2 K_{Di,t} + \gamma_3 K_{Fi,t} + \gamma_4 W_{i,t} + \gamma_5 Z_{i,t} + \gamma_6 (Z*K_F)_{i,t} + e_t + v_i + \varepsilon_{i,t} \quad (3)$$

where,

- $Y$  = The real GDP per capita
- $L$  = The labour force
- $K_D$  = The domestic investment
- $K_F$  = FDI
- $W$  = A set of other factors that explain economic growth such as trade openness, public debt and inflation
- $Z$  = Quality development of infrastructure
- $(Z*K_F)$  = The interaction term between the quality development of infrastructure and FDI
- $\tau$  = A constant
- $e_t$  = Time-specific effects which are also assumed to be independently and identically distributed over all time periods
- $v_i$  = An unobserved country-specific effects which are independently and identically distributed overall the nineteen countries of the COMESA region
- $\varepsilon_{i,t}$  = A normally distributed error term
- $\gamma_1, \gamma_2, \gamma_3, \gamma_4, \gamma_5$  and  $\gamma_6$  = The parameters to be estimated

The incorporation of dynamics into Eq. (3) requires that the equation be rewritten as an AR(1)<sup>6</sup> model by including the past values of GDP per capita as an independent variable. This operation produces Eq. (4):

$$Y_{i,t} = \tau + \gamma_0 Y_{i,t-1} + \gamma_1 L_{i,t} + \gamma_2 K_{Di,t} + \gamma_3 K_{Fi,t} + \gamma_4 W_{i,t} + \gamma_5 Z_{i,t} + \gamma_6 (Z*K_F)_{i,t} + e_t + v_i + \varepsilon_{i,t} \quad (4)$$

where,  $\gamma_0$  is the parameter for the difference of lagged values of GDP per capita. The rest of the terms are as explained in Eq. (3).

**Econometric model:** The estimated equation used is given by Eq. (5):

$$GDPPC_{i,t} = \tau + \gamma_0 GDPPC_{i,0} + \gamma_1 GDPPC_{i,t-1} + \gamma_2 HUMCAP_{i,t} + \gamma_3 DINV_{i,t} + \gamma_4 TRADE_{i,t} + \gamma_5 PUBDEBT_{i,t} + \gamma_6 INFLA_{i,t} + \gamma_7 FDI_{i,t} + \gamma_8 INFR_{i,t} + \gamma_9 (INFR*FDI)_{i,t} + e_t + v_i + u_{it} \quad (5)$$

where,

- $GDPPC_{i,t}$  = The GDP per capita in country  $i$  during period  $t$
- $GDPPC_{i,t-1}$  = Lagged GDP per capita
- $HUMCAP$  = The human capital stock (measured by the Human Development Index, HDI)
- $DINV$  = The domestic investment (measured by the share of gross fixed capital formation in constant dollars to GDP ratio)
- $TRADE$  = Trade openness (measured by the share of total imports and exports to GDP)
- $PUBDEBT$  = The public debt (measured by the share of the gross debt liabilities to GDP ratio)
- $INFLA$  = The changes in annual general level of prices
- $FDI$  = The foreign direct investment
- $INFR$  = Quality development of infrastructure
- $INFR*FDI$  = The interaction term between the human capital development and FDI
- $\gamma_0$  = A parameter reflecting the speed of convergence of GDP per capita from one period to the next
- $\tau$  = A constant
- $e_t$  = Time-specific effects which are also assumed to be independently and identically distributed over all time periods
- $v_i$  = An unobserved country-specific effects which are independently and identically distributed over the countries in COMESA region
- $u_{it}$  = The error term which is assumed to be independently and identically distributed over all time periods in country  $i$
- $\gamma_1, \gamma_2, \gamma_3, \gamma_4, \gamma_5, \gamma_6, \gamma_7, \gamma_8$  and  $\gamma_9$  = The estimable parameters

A positive (negative) sign of the parameters suggests that an increase in the respective variable by one percent leads to an increase (decrease) of GDP per capita by the percentage size of the parameter. In model Eq. (5), the coefficient  $\gamma_7$  is interpreted as the marginal rise in the impact of FDI on the real GDP per capita when the development of human capital improves. The converse also holds true.

**Variables used in the study:** The growth performance of GDPPC measures the overall performance of an

economy. The GDP per capita in this study is measured by the nominal real GDP per capita deflated by the GDP deflator (base 2000 = 100). The lower the starting level of real GDP per capita the higher the predicted growth rate (Barro, 1991; Levine and Renelt, 1992). Growth is expected to be rapid at first then slows down as the economy becomes more developed. Consequently,  $\gamma_0 < 0$ .

Additionally, the current GDPPC is expected to be affected positively by lagged GDP per capita,  $GDPPC_{i,t-1}$ . In other words, high values of real GDP per capita in the past are expected to positively influence growth of the current real GDP per capita in the COMESA region. Hence,  $\gamma_1 > 0$ .

HUMCAP, represented by the Human Development Index (HDI) in this study, is expected to affect current GDPPC positively and enhance the ability of the COMESA region to absorb and benefit from spillovers of FDI. According to Kitonyo (2018) high level of human development in terms of leading a long and healthy life, being knowledgeable and educated and having a decent standard of living promotes economic growth and enable the host economy to absorb and benefit from spillovers of FDI. It is expected that  $\gamma_2 > 0$ .

DINV has a positive effect on the GDPPC. Increased rate of domestic capital investment promote productivity in an economy. Domestic investment in this study is represented by the share of gross fixed capital formation in constant dollars to GDP ratio. Thus,  $\gamma_3 > 0$ .

Measured by the share of trade (imports and exports) to GDP, trade openness of the host economy is expected to enlarge markets and expand domestic investment so as to meet increased demand for goods and services (Feder, 1982). The performance of COMESA region's total imports and exports and adoption of trade liberalization by member countries could also increase the significance of the impact of short term foreign capital flows on economic growth. TRADE is therefore expected to have a positive impact on the GDPPC as well as enhance the ability of the COMESA region to absorb and benefit from the spillovers of FDI. Hence, it is expected that  $\gamma_4 > 0$ .

High level of debt liabilities in the form of Special Drawing Rights, currency and deposits, debt securities, loans, insurance, pensions and standardized guarantee schemes and other accounts payable, represents the risk for an economy to encounter difficulties in reimbursing its public debt and to face a financial crisis. The presence of a large public debt can also adversely affect investment by reducing the funds available to invest, given that the return from new investments will be overly taxed in order for the government to repay the debt. The study anticipates a negative impact of PUBDEBT, measured by the share of the gross debt liabilities to GDP ratio, on GDPPC. Therefore,  $\gamma_5 < 0$ .

Macroeconomic instability, reflected by high, rising and unstable general levels of prices, reduces real

future profits and cause uncertainties to investors. According to Larraín and Vergara (1993) and Servén and Solimano (1993), macroeconomic instability provides uncertain and unreliable economic environment, which does not allow the investors to benefit from the existing profit opportunities. The priori expectation is that INFLA, measured by the annual percentage change in the Consumer Price Index (CPI), has a negative impact on the GDPPC of the host country. Therefore,  $\gamma_6 < 0$ .

FDI, measured by net FDI stocks<sup>7</sup>, promotes GDP per capita growth of host countries by filling the gap between desired investment and domestically mobilized savings, complementing domestic investment, creating employment, increasing tax revenues, introducing new technology, improving managerial and labour skills. Hence, it is expected to impact positively on current GDP growth. Hence,  $\gamma_7 > 0$ .

According to Aschauer (1989), Babatunde (2011), Barro (1990), Rangqu (2014) and World Economic Forum (2017), development of quality overall infrastructure, roads, railroads, ports, air transport and availability of airline seat kilometres, electricity supply, fixed telephone lines and mobile telephone subscriptions minimize the cost of doing business, improve private investment returns, attract more foreign investment and promote productivity and GDP per capita growth. The a priori expectation is that INFR impacts positively on GDPPC and enhances the ability of the COMESA region to absorb and benefit from spillovers of disaggregated foreign capital and financial resources. Therefore,  $\gamma_8 > 0$ .

**Analysis of data and technique of estimation:** The study utilizes a panel data drawn from nineteen countries in the COMESA region over 2000-2015 period. A dynamic panel data GDP per capita model, where the lagged dependent variable, the GDP per capita, is added to the explanatory variables, is estimated. It is argued that the lagged GDP per capita has a positive impact on the current GDP per capita.

This study uses the Generalized Method of Moments (GMM) technique suggested by Arellano and Bond (1991) to account for dynamics and resolves endogeneity, unobserved heterogeneity and short panel bias problems.

## RESULTS AND DISCUSSION

The analysis begins by providing the summary descriptive statistics in Table 1 that describe the features of the data used in the study.

The results of the correlation of variables are presented in Table 2. An explanatory variables correlation matrix is used to test the presence of multicollinearity in the dynamic panel data GDP per capita model specified in Eq. (5).

Table 1: Summary statistics

Variable	Mean	Median	Min.	Max.	S.D.
GDP Per Capita (PPP US Dollars)	4,911.76	1,835.72	377.20	29,646.60	6,541.35
Domestic investment (%GDP)	21.15	19.85	2.00	51.79	8.84
Human capital development (HDI)	0.46	0.42	0.22	0.81	0.15
Public debt (% GDP)	65.12	52.67	1.01	202.05	46.17
Openness of the economy (% GDP)	76.07	65.50	21.00	225.00	43.04
Inflation (%)	11.41	7.94	0.06	94.96	12.43
Foreign direct investment (% GDP)	28.43	20.65	0.00	168.66	29.13
Infrastructure (INFR) (index)	2.70	2.58	1.52	4.75	0.73

Min.: Minimum; Max.: Maximum; S.D.: Standard deviation ; Authors' computations

Table 2: Correlation matrix of variables in levels

Variable	GDPPC <sub>1,t</sub>	GDPPC <sub>1,0</sub>	DINV	HUMCAP	PUBDEBT	TRADE	INFR	INFLA	FDI
GDPPC <sub>1,t</sub>	1.000								
GDPPC <sub>1,0</sub>	-0.007	1.000							
DINV	0.338	0.325	1.000						
HUMCAP	0.585	0.089	0.273	1.000					
PUBDEBT	-0.124	-0.112	-0.220	-0.182	1.000				
TRADE	-0.570	0.578	0.119	0.590	-0.097	1.000			
INFR	0.225	0.483	0.252	0.579	-0.340	0.453	1.000		
INFLA	-0.166	-0.219	-0.059	-0.123	0.208	-0.040	-0.155	1.000	
FDI	0.018	0.367	0.220	0.363	0.061	0.598	0.208	-0.063	1.000

Author's own computations

Table 3: Arellano and Bond (1991) GMM-difference estimates of the impact of FDI on economic growth in the COMESA region, 2000-2015

Dependent variable = GDP Per Capita (GDPPC)	Dynamic panel data GDP per capita model
Initial GDP per capita (GDPPC <sub>1,0</sub> )	-0.418 (0.013)**
GDP per capita (GDPPC <sub>1,t</sub> )	0.191 (0.006)***
Human capital development (HUMCAP)	0.684 (0.012)*
Domestic investment (DINV)	0.142 (0.062)*
Public debt (PUBDEBT)	-0.157 (0.023)**
Trade openness (TRADE)	-0.004 (0.983)
Inflation (INFLA)	-0.139 (0.044)**
Foreign direct investment (FDI)	-0.531 (0.002)***
FDI*INFR	0.368 (0.011)**
Constant	0.138 (0.589)
Number of observations	228
Number of instruments	120
A-B test 1 <sup>st</sup> order	-2.686 (0.007)***
A-B test 2 <sup>nd</sup> order	-1.158 (0.247)
Sargan over-identification test	158.60 (0.200)
Wald (joint) test	5615.96 (0.000)***
Adjustment speed, $\lambda = 1-\gamma_0$	0.809

P-values are reported in parentheses with \*, \*\*, \*\*\* denoting significance at 10, 5 and 1 percent, respectively; The Arellano and Bond (A-B) Z-statistic tests the null hypothesis that the residuals are first-order correlated (A-B test 1<sup>st</sup> Order) and the residuals are not second-order correlated (A-B test 2<sup>nd</sup> Order); The Wald test, a test of joint significance, tests the null hypothesis that the coefficients of time dummies are zero; Authors' computations

The results in Table 2 shows that all the zero-order correlation coefficients between any two regressors are low, ruling out the presence of perfect or near perfect linear relationship. Thus, there is no relationship among the independent variables, implying that the regression obtains determinate coefficient and finite standard errors.

On one hand, the same Table shows that GDP per capita has a positive correlation with domestic investment and human capital development as theoretically predicted. The FDI is positively related to GDP per capita in line with economic theory.

On the other hand, the Table further indicates that growth is negatively correlated with initial GDP per capita, public debt and inflation, as theoretically predicted. However, economic growth is negatively correlated to trade openness of the economy, contrary to economic theory.

The estimates of the dynamic panel GDP per capita Eq. (5) generated by using the one-step Arellano and Bond (1991) GMM difference estimator are presented in Table 3.

The diagnostic test results shows that the model is correctly specified and GMM-difference estimator yields reliable and efficient results.

The regression results suggest that FDI matter for economic growth in the COMESA region. The negative and significant coefficient of the impact of FDI on the GDP per capita imply that a rise in FDI leads to a direct decrease in the growth of GDP per capita in the COMESA region. This finding is supported by previous authors such as Agbloyor *et al.* (2014), Bos *et al.* (1974), Jugurnath *et al.* (2016), Prebisch (1968), Saltz (1992) and Singer (1950) and among others, who found a negative and statistically significant effect of FDI on growth.

The negative impact of FDI on the growth of GDP per capita in Africa could be explained by the lack of synergies between FDI and domestic investment (Ndikumana and Verick, 2008); few linkages to domestic firms, spillover opportunities and little value-added processing of the resources (Morrissey, 2012); lack of competition among the FDI players in Africa and distorted regulatory and incentive frameworks and poor governance, weak institutions, relatively high corruption and political instability (Asiedu, 2006), among others.

Quality development of infrastructure has a positive direct impact on economic growth in the

COMESA region. This finding is supported by Munnell (1992) and Yamin and Sinkovics (2009) who revealed that infrastructure is a key driver of growth and a precondition for positive FDI spillovers in the host country.

Most importantly, the results shows that the parameter of the interaction term (FDI\*INFR) is positive and statistically significant at 5% level of significance. The result confirms findings by Elboiashi (2011) who argued that the contribution of FDI to economic growth is conditional on the levels of infrastructure, Asiedu (2002) who concluded that FDI investors in sub-Saharan Africa, especially those interested in extraction of natural resources, minerals, oil and gas, require infrastructure quality to positively influence FDI, Aschauer (1989), Babatunde (2011), Rungqu (2014) and Tondl and Prüfer (2007) who argued that infrastructure is a conditional factor for FDI to produce growth effects in the host country. Chen *et al.* (2015) added that Chinese private investments have been attracted particularly to Ethiopia and relatively resource-poor East African countries such as Kenya and Uganda, because of a relatively more developed infrastructure and ports. Overall, this result suggests that quality development of infrastructure has a positive effect on the growth impact of FDI in the COMESA region.

The coefficient of the initial GDP per capita is statistically significant at 5% level of significance, supporting conditional convergence. Additionally, the parameter of the past values of GDP per capita is statistically significant at 1% level of significance, suggesting that the past values of GDP per capita growth has a significant positive impact on the current economic growth rate.

Consistent with Cohen (1993) and Larraín and Vergara (1993) public debt and inflation exerts a negative and statistically significant impact on the GDP per capita in the COMESA region.

### **CONCLUSION**

The objective of this study is to investigate the effect of quality development of infrastructure in the growth impact of FDI in the Common Market for Eastern and Southern Africa region over the period 2000-2015. The empirical studies reviewed in this study showed conflicting outcomes, where results of some studies are positive, while others are negative and indeterminate. In order to attain the aim of the study, a dynamic panel data GDP per capita model is estimated using the one-step GMM estimators suggested by Arellano and Bond (1991).

The study confirms conditional convergence and finds that FDI exerts a negative and statistically significant impact on GDP per capita in the region. The study further reveals that the past values of GDP per capita and domestic investment affects growth

positively. Additionally, quality development of infrastructure is found to exert a positive impact on the GDP per capita and enhance the ability of the region to absorb and benefit from FDI. Finally, high inflation, growth in public debt exhibit a negative impact on the GDP per capita in the COMESA region.

The Governments of the states of the COMESA region are recommended to target to attract beneficial FDI that significantly increase employment, enhance skills and boost the competitiveness of local enterprises and therefore promote growth. The Governments should also improve human capital development so as to exploit the positive impact of FDI. Additionally, the Governments could consider allocating more resources to support quality development of infrastructure.

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### **CONFLICT OF INTEREST**

We do not have any conflict of interest to declare.

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**End note:**

- <sup>1</sup>: Mergers and related non-equity forms of FDI such as international joint ventures are reported together. Joint ventures are businesses arrangements in which two or more parties agree to pool their resources for the purpose of accomplishing a specific task. This task can either be a new project or any other business activity. The parties retain their distinct identities in the course of the business arrangement.
- <sup>2</sup>: These countries include Djibouti (2.4% per annum), Egypt (2.4% per annum), Ethiopia (6.0% per annum), Libya (2.3%), Mauritius (3.5% per annum), Rwanda (4.7% per annum), Seychelles (2.4% per annum), Sudan (4.1% per annum), Uganda (3.1%

- per annum) and Zambia (3.6% per annum), among others (International Monetary Fund, 2015).
- <sup>3</sup>: The other factors that influence economic growth include among others openness of the economy, public debt and inflation.
  - <sup>4</sup>: Elboiashi (2011) interacted the human capital, technology gap, infrastructure development, institution quality, financial market development and trade openness with FDI so as to investigate the effect of the host country conditions on the impact of FDI in 76 developing countries between 1980 and 2005.
  - <sup>5</sup>: Kitonyo (2018) investigated the growth impact of aggregated and disaggregated foreign capital and financial resources in the Common Market for Eastern and Southern Africa. The author tested the hypothesis that absorptive capacity affect the impact of the aggregated and disaggregated foreign capital and financial resources on economic growth by interacting their respective variables with different factors of absorptive capacity. The study tested the significance of the interacted coefficient.
  - <sup>6</sup>: AR(1) stands for autoregressive dynamic panel data model of order one.
  - <sup>7</sup>: FDI stock is the value of the share of their capital and reserves (including retained profits) attributable to the parent enterprise, plus the net indebtedness of affiliates to the parent enterprises (UNCTAD, 2017).