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# Determinants of foreign direct investment inflows to COMESA member countries: an integration of institutional and socio-economic factors

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## Abstract

In developing economies, stable foreign direct investment inflow is used as a means of realization of private sector growth and sustainable development goals. However, there is variability in inflows to African region in general and its economic bloc groupings in particular overtime across countries. In this regard, numerous empirical studies have been carried out on the determinants of investment inflow variability using different datasets on developing countries despite the studies have produced paradoxical findings. The aim of this study is, therefore, to empirically identify factors that determine variability of foreign direct investment inflows to COMESA member countries using panel data estimators. The study used explanatory research design with arrangement of secondary data, ex post control over variables, unbalanced short panel inclined with quantitative approach. The data were acquired from world development and governance indicators of World Bank for a period of 15 years ranging from 2002 to 2016 for 17 countries. Econometric model estimation procedures and diagnostic tests for classical linear regression model assumptions were carried out before making valid analysis. Accordingly, empirical evidence of the study revealed that infrastructure, government effectiveness, economic growth, control over corruption, trade openness, political stability, human capital and financial development have statistically positive effect on the inflow. However, external debt, inflation and regulatory quality failed to show significant effect. Therefore, member countries should take measures to narrow-up bottlenecks of financial development, improve infrastructure, scale-up trade integration, improve human capital quality, work to bring better political stability and to control corruption in order to boost-up stable inflows.

**Keywords:** COMESA, Foreign direct investment, Panel estimators

## Introduction

In developing economies, inflow of foreign direct investment (FDI, hereafter) has been recognized as secure element of capital inflows capable of producing economic expansion as long as foreign direct investors usually place a long-term commitment to host countries (Esew & Yaroson, 2014; Mugambi & Murunga, 2017). Moreover, it is

considered as external source of financing that could be used as a means of private sector growth implementation and sustainable development goals (Alla et al., 2015; Hassan, 2017). In this regard, most developing countries have implemented various economic reforms to increase foreign direct investment inflow and to take its advantage (Vinesh et al., 2014). In the same fashion, some African countries introduced policy measures for the promotion of FDI inflows by improving their general investment policy environment (Suleman et al., 2015). As economic bloc and regional integration, COMESA has clear investment provisions such as the COMESA common investment agreement and regional investment agency of COMESA to attract foreign investors. However, there is variability in the inflow of FDI across to the member countries over time as of world development indicators dataset (UNCTAD, 2017).

Despite the fact that numerous empirical and theoretical studies have been carried out on the determinants of FDI inflows using different datasets on developing countries, empirical results obtained so far, however, are riddling that have produced conflicting results (Alla et al., 2015; Anyanwu, 2012; Basemera et al., 2012; Buthe & Milner, 2008; Dlamini et al., 2015; Hailu, 2010; Sichei & Kinyondo, 2012; Workneh, 2014; Yasmin et al., 2003). To mention few findings, for instance; empirical study made by Basemera et al. (2012) found corruption, inflation, openness of economy and GDP per capita as determining factors of investment inflows to East African countries. Besides, Suleman et al. (2015) found market size, availability of natural resource and trade openness as positive determinants in southern Africa customs union countries using pooled OLS, considering foreign companies as resource seeking. In addition, a study conducted by Kaliappan et al. (2015) in ASEAN countries using static panel revealed that human capital, infrastructure, trade openness and market size affects investment inflow positively with negative effect of inflation. Further, Yasmin et al. (2003) found standard of living, urbanization, current account, inflation, and wages as determinants of FDI in low income countries. Moreover, Sichei and Kinyondo (2012) found natural resources, economic growth and international investment agreements as determining factors of FDI in African countries using dynamic panel estimators.

Not only the above, a study carried out by Vinesh et al. (2014) on determinants of foreign direct investment for Southern African Development Community found gross domestic product, trade openness, secondary school enrollment rate and natural resources as influencing factors of the inflows. Further more, Jadhav (2012) found that market size, trade openness, availability of natural resource and rule of law as determinants in attracting foreign investment in BRICS.

Despite the efforts made, previous empirical studies on the determinants of foreign direct investment in different countries have largely aimed at testing Dunning's (1981) eclectic paradigm of ownership, location and internalization advantages of investors from host countries. Surprisingly, to the best of the researcher's knowledge, the impact of institutional and governance qualities on inflows of foreign direct investment, however, have been missed by many studies. Considering this, there is a need of study on determinants of FDI inflows in African countries by incorporating socio-economic, institutional and governance factors to attract foreign investors. This paper, therefore, seeks to identify empirically the determinants of FDI inflows by integrating economic and institutional factors using data set that covers 17 COMESA member countries over

the period 2002–2016 based on previous studies' empirical results and theoretical considerations with central research question of “what factors determine inflows of FDI to COMESA member countries?”

The grounds to conduct this study are three folds. First, empirical results available in the literature of foreign direct investment determinants are mixed that have produced conflicting results. In some empirical evidences some factors seem to be more significant than others where as the same factors in other empirical evidences are not important factors in determining FDI inflows (Kingu, 2016). Among others, the puzzling results may depend on the researchers' choice of countries, time-periods and applied methodologies while conducting their study. Second, studies on African region in general and its economic bloc groupings in particular are still limited in addition to the paradoxical result of empirical evidences which needs empirical investigation (Suleman et al., 2015). Third, as economic bloc, there is uneven distribution of inflows in FDI to the member countries of COMESA over the study period as discussed in the introduction and there is no evidence about the causal factors for the variability of inflow across the member countries overtime.

The remainder of this paper is structured as follows: Section two discusses about literature review followed by section three research methodology. Section four presents empirical results and discussion. Finally, section five provides the conclusion thereafter forwards recommendation.

### **Literature review**

This section describes empirical evidences on the determinants of foreign direct investment inflows and develops hypotheses to narrow the gap between what is now in the literature about the influencing factors and what factors determine FDI inflows to COMESA member countries. In this regard, the study reviewed economic and institutional factors affecting inflows of FDI.

### **Socio-economic factors nexus foreign direct investment inflows**

As economic factor, this section starts with the effect of market size on FDI. Market size emphasizes the importance of a large market for efficient utilization of resources and exploitation of economies of scale that could play an important role in attracting inflows of foreign direct investment (Chaliapin et al., 2015). In this vein, it is believed that the larger the market size indicated by GDP of host countries may have greater inflow of foreign direct investment (Wyk & Lal, 2008). This is for the fact that growth rate in economy creates vast opportunities to invest (Wyk & Lal, 2008); whereas, unstable economic environment, characterized by high inflation may raise the cost of investment and affect the return of it in a negative way (Suleiman et al., 2015). Moreover, it is argued that high inflation would deter inflow of FDI because it increases uncertainty and adversely affects long-term investments to the host countries (Kaliappan et al., 2015; Sichei & Kinyondo, 2012).

Besides, the availability and quality of supportive infrastructural facilities is essential for the smooth functioning of investment activities (Shah, 2014). In this regard, it is believed that countries with well-developed infrastructures, such as water supply, airports, power supply, telephone, roads, and internet would be able to minimize costs of

doing business for foreign investors (Kaliappan et al., 2015; Sichei & Kinyondo, 2012; Suleiman et al., 2015). In addition, the degree of openness which could be measured in terms of trade ratio is an indicator of the level of global integration of a nation. It is believed that trade openness promotes efficient resource allocation through specialization as well as competition in different markets to take comparative advantage (Shahzad et al., 2012; Vinesh et al., 2014).

In addition, there is a documented evidence on the relationship between external debt and FDI. Excessive foreign debt can be a source of instability and uncertainty in macroeconomic environment which in turn reduces inflows of FDI to the host country (Dlamini et al., 2015). In his regard, scholars indicate that external debt is bad as far as it results to increase external debt service which eats profit of foreign investors (Mugambi & Murunga, 2017). As a socio-economic factor, human capital, proxied by skill labor force, is also a relevant determinant that affects the level of productivity in investment. This is for the fact that skilled labor sectors where the level of education improves, productivity increases and facilitates implementation of technological innovations (Sichei & Kinyondo, 2012; Kisto, 2017; Vinesh et al., 2014). The higher the level of education of the host country, the higher its propensity to attract foreign investors and technological spillover is encouraged (Esew & Yaroson, 2014). Moreover, a financial system has great contribution for the smooth functioning of modern economy and is represented by functioning of financial institutions especially banks. Hence, the development of domestic financial system might help foreign firms to raise finance in order to broaden investment activities in host country (Vinesh et al., 2014). An efficient financial system is also indispensable in attracting capital investment, as a secure capital and money market would provide the essential financial assistance (Esew & Yaroson, 2014).

#### **Institutional factors and foreign direct investment inflows**

In this section, the effect of governance and institutional factors on inflow of FDI is discussed. In this regard, the nexus between government effectiveness and FDI inflows is discussed first followed by other governance indicators. A government is said to be effective if the civilians are provided with best quality services and their lives are free from political pressures (Shah & Afridi, 2015). As cited by Basemera et al. (2012), the World Bank (2007) defines governance as the manner in which public officials and institutions acquire and exercise authority to shape their public policy and provide public goods. A study carried out by Jadhav (2012) on determinants of foreign direct investment in BRICS (Brazil, Russia, India, China and South Africa) economies revealed the influence of government effectiveness on foreign direct investment. Besides, the effect of corruption control on FDI inflow is reviewed. Different studies have examined the economic impact of corruption using various theories, such as public choice, rent-seeking, transaction cost, institution and social cost, socio-cultural perspectives and property rights (Quazi, 2014).

With regard to nexus of corruption and inflow of foreign direct investment, however, there is mixed evidence. On the one hand, the grabbing hand theory of corruption which is supported by economists such as Shleifer & Vishny (1992, 1993), Bliss &

Di Tella (1997), & Aidt (2003) explained corruption like a grabbing hand that increases costs involved in conducting economic activities in the market that could raise the cost of doing business, distorts the resource allocation, and decreases output-generating capacity of foreign investment. On the other hand, the helping hand theory of corruption which is supported by researchers such as Beck & Maher (1986), Lui (1985) & Saha (2001), claims on corruption as an efficient lubrication against a rigid economic regulation by facilitating transactions in countries with excessive regulations that may in turn increase foreign direct investment inflows (Alemu, 2012).

In addition, foreign investors are likely to think about the political stability of a host country before making investment. It is believed that political stability of host countries reduces risks and investment uncertainty that could lead to an increase in FDI inflows (Basemera et al., 2012). Therefore, political risk in a country is an important consideration for foreign investors that may influence foreign direct investment inflows negatively (Kariuki, 2015). Political stability of a country is composed of different sub components like government stability, internal and external conflict, religious and ethnic tensions, democratic accountability and bureaucracy quality. Thus, political instability and frequent occurrence of civil disorder create an unfavorable business climate which seriously erodes the risk-averse foreign investor's confidence to make investment (Sichei & Kinyondo, 2012). If a country's political condition is not good, investors will hesitate to bring any investment projects until they are assured that the business environment would to be favorable and conducive (Brada et al., 2005; UNCTAD, 2010; World Bank, 2011 as cited by Shahzad et al., 2012).

Moreover, regulatory quality which indicates the governments' ability of formulating and implementing sound policies as well as regulations that could permit and promote private sector development affects flow of foreign direct investment positively (Fakher, 2014). This is for the fact that some regulations such as price control, high tax loads, stock market limitations can restrict and prevent the development of foreign direct investment inflows. On this basis, government can play a remarkable role for improvement and development of foreign investment through decreeing appropriate regulations and through clarifying the current existing structures, equalizing the opportunities, reducing the rent-seeking costs, and also updating the legal disciplines (Barkhordari et al., 2017). Therefore, regulatory quality is expected to encourage the entry of foreign investors by eliminating market unfriendly policies such as price controls, government intervention, and restrictions on capital movement (Fazio & Talamo, 2008; Shah & Afridi, 2015).

## **Materials and methods**

### **Research paradigm and approach**

The study used ex post facto quantitative approach under positivist paradigm that reflects a deterministic philosophy in which causes probably determine outcome and knowledge creation is restricted to what can be observed and measured. Quantitatively, the purpose is to determine factors influencing FDI inflows to COMESA member countries deductively to test formulated hypotheses based on prior theoretical and empirical studies.

### Sampling and data

There are 19 member countries in COMESA. These are Ethiopia, Burundi, Djibouti, Comoros, Egypt, Congo, Eritrea, Kenya, Malawi, Libya, Madagascar, Mauritius, Swaziland, Rwanda, Sudan, Seychelles, Uganda, Zimbabwe and Zambia. In this regard, target population of the study comprised all member countries. However, only data of 17 countries were used in the study purposely by excluding countries (Eritrea and Libya) with many missing observations on the variables of the study.

The type of data employed was secondary data. Specifically, the study used short and unbalanced panel data that include large cross section and small time with missed values; blending characteristics of both cross-sectional and time-series data. The data were acquired from world development and governance indicators of World Bank for period of 15 years ranging from 2002 to 2016 for 17 countries. The rationale to start the time period from 2002 is due to the unavailability of data regarding world governance indicators of World Bank before the year indicated above.

### Variable measurement

Although prior empirical evidences on FDI inflow determinants have suggested numerous possible explanatory variables, it is impracticable to include all of them due to many resource related constraints and/or availability of data. In the current study, unquestionably, the choice and measurement of variables was based on previous empirical studies and availability of data. Therefore, variables incorporated in this study were delimited by accessibility of secondary data of World Bank development and governance indicators. Accordingly, the study incorporated host countries' economic, social, political and institutional factors that determine inflow of FDI measured by net inflows as percentage of GDP. To be specific, inflation, economic growth, infrastructure, trade openness, government effectiveness, regulatory quality, political stability, control over corruptions, external debt, human capital and financial development were considered as foreign direct investment influencing factors based on their relative importance from previous empirical literature and availability of data in the study period for the member countries. Accordingly, measurement of these variables is dealt here. First, the index of government effectiveness is calculated based on public service quality; effectiveness of the state apparatus; the degree of independence of civil service from political pressures. Thus, estimate gives country's score on aggregate indicator and percentile rank reflects rank of a country among others. To be specific, the percentile rank approaches to 0 imply lowest rank and a percentile that approaches to 100 indicates highest rank (Babayan, 2015; Chaib & Siham, 2014; Kaufmann et al., 2008). With regard to trade openness, though few studies measure it using import or export as percentage share of GDP, in the current study it is measured by international trade as percentage share of GDP (Anyanwu, 2012; Fiodendji, 2016; Shahzad et al., 2012; Vinesh et al., 2014). External debt is proxied by external debt stocks of host countries (Dlamini et al., 2015; Mugambi & Murunga, 2017; Yasmin et al., 2003). Besides, political stability measures perceptions of political instability risk and/or violence motivated by politics. In fact, estimate gives score of a country on aggregate indicator, and percentile rank designates rank

of a country among entire countries covered by the indicator, with 0 corresponding to lowest rank and 100 to highest rank. Indeed, political instability risk is proxied by an indicator developed by world governance indicators project of World Bank (Basemera et al., 2012; Chaib & Siham, 2014; Quazi, 2014). Host country's domestic credit supply to private sector as percentage of its GDP is used to measure financial development of the member countries. Infrastructure is measured using number of mobile cellular subscription per hundred persons for country as a proxy of information and communication technologies (Kaliappan et al., 2015; Suleman et al., 2015; Vinesh et al., 2014; Zekarias, 2016). As additional explanatory variable, human capital is measured by secondary school enrollment as percentage of gross enrollment (Anyanwu, 2012; Esey & Yaroson, 2014; Fiodendji, 2016; Kisto, 2017; Vinesh et al., 2014; Yasmin et al., 2003). Moreover, regulatory quality captured the perceptions of governments' ability to formulate and implement best policies as well as regulations that could permit and promote development of private sector (Babayan, 2015; Chaib & Siham, 2014; Kaufmann et al., 1999). Likewise, the above indicators of good governance, estimate gives a country's score on the aggregate indicator, and percentile rank indicates a country's rank among all countries covered by the indicator, with 0 corresponding to lowest rank, and 100 to highest rank. Further, economic growth is measured by GDP growth rate (Anyanwu, 2012; Buthe & Milner, 2008; Vinesh et al., 2014). Inflation is measured by consumer price index. Finally, even if it is possible to measure control over corruption using corruption perceptions index adopted by transparency international which is global coalition against corruption the index developed by world governance indicator is used in the current study due to the data availability (Anyanwu, 2012).

### **Empirical results and discussion**

Empirical models are mostly formulated based on theoretical background and/or previous empirical evidences. In this regard, the current study considers both theoretical and empirical issues related with foreign direct investment while formulating the econometric model. In the existing literature, there is no single superior theory which comprehensively explains foreign direct investment. Therefore, it is important to conduct research from a specific theoretical background (Makoni, 2015). Product cycle theory, industrialization theory, ownership advantage theory, internationalization theory, eclectic paradigm are few among many theories of FDI. Industrialization theory of FDI states that the flow of foreign direct investment affects host country's industrial structure by initiation and diffusion of industrialization across countries as long as adopting foreign invented technology is generally beneficial for industrial development (Soreide, 2001).

According to product cycle theory of FDI (Vernon, 1966), multinational firms establish their manufacturing facilities in foreign countries when their product reaches maturity stage in the home country. Besides, ownership advantage theory of FDI states that firms with better competitive advantage domestically derived from their valuable assets like brand names, technology and large-scale economics extend their operations to foreign

markets in other countries through FDI to utilize their assets. This theory, however, fails to explain the means of entering to foreign markets in order to exploit the ownership advantages which is solved by internationalization theory. Internationalization theory of FDI, therefore, concerns extending the direct operations of foreign firms and bringing under common ownership and control of the activities conducted by intermediate markets that link the firms to customers through various means like licensing, franchising and exporting by entering a contract with foreign firms (Morgan & Katsikeas, 1997). In the same fashion, internalization theory fails to explain locational advantage. Accordingly, eclectic theory incorporates locational advantage of FDI in addition to the ownership advantages and internalization advantage. According to this theory, foreign companies go abroad get the competitive advantages by consuming resource endowments of host countries and unique strengths of the investing company. Accordingly, this study is based on Dunning's foreign direct investment eclectic paradigm by incorporating additional institutional and governance variables. This is for the fact that the framework is influential model for many empirical researches on FDI affecting factors for long time (Alla et al., 2015; Azam, 2010; Basemera et al., 2012). To this effect, based on (Dunning, 1988, 2000):

$$FDI = f(\text{ownership advantage, location advantage, internalization advantage}).$$

From the OLI, the location advantages could be considered as country specific factors (demand/pull factors) and ownership and internalization advantages are supply side (push side) factors which are company specific. To put it in other way, supply side factors are external to host country, however, demand side are factors internal to host (recipients) countries economic, political and social factors (Alavinasab, 2013; Anyanwu, 2012; Hailu, 2010; Popovici & Călin, 2014).

As a result, the dependent variable in the econometric model of this study is foreign direct investment inflow and the regressors are demand side factors including inflation, economic growth, infrastructure, regulatory quality, political stability, government effectiveness, trade openness, external debt, human capital, financial development, and control over corruption. To put it in a functional form:

$$\begin{aligned} &\text{Inflow of Foreign Direct Investment} \\ &= f(\text{inflation, economic growth, infrastructure,} \\ &\quad \text{trade openness, government effectiveness,} \\ &\quad \text{political stability, regulatory quality, external debt,} \\ &\quad \text{human capital, financial development, and control over corruption}). \end{aligned}$$

Based on the above functional form, it is better to provide panel econometric models (static and dynamic). In line with this, literature revealed pooled OLS, random effect and fixed-effect estimators as static panel estimators. The OLS estimator assumes homogeneity across study units (Cameron & Trivedi, 2005). In this regard, if there is heterogeneity, the estimator is inconsistent. If we are concerned that the OLS results may be biased due to unobserved individual heterogeneity across unit, either fixed effect or random effect could be used based on some preconditions. Therefore, checking whether there is existence of poolability (homogeneity) or unobserved individual

heterogeneity across units is important thing. To check the existence of homogeneity, the Lagrange multiplier and  $F$ -test at the bottom of fixed-effect regression output could be used (Park, 2011). While doing this, significant result of Lagrangian multiplier test and  $F$ -test reject homogeneity. Therefore, statistical results of Breusch–Pagan Lagrange multiplier test ( $\text{Prob} > \text{chibar}2 = 0.0019$ ) and  $F$  test at the bottom of fixed-effect regression ( $\text{Prob} > F = 0.0021$ ) revealed significant output, suggesting existence of individual heterogeneity in this study.

Being certain about the existence of individual heterogeneity, the next point is to check whether there is correlation between individual effect and explanatory variables. In this regard, random effects estimator assume no correlation between country's error term and explanatory variables. Besides, time-invariant regressors are allowed to play a role as predictor variables (Reyna, 2007). Fixed effect, however, assumes that variations across countries could be captured by variation in the constant term. Moreover, the model allows correlations between unobserved individual effects (heterogeneity) and variables included in an econometric model (Cameron & Trivedi, 2005). To test whether there is endogeneity (correlation between individual effects and explanatory variables), Hausman test was carried out. The statistical result ( $\text{Prob} > \text{chi}2 = 0.0001$ ) favors fixed-effect regression. To this end, statistical output of fixed-effects (within) regression was used for analysis and discussion purpose as static panel data estimator. Accordingly, the above functional form could be transformed and described into the following static econometric model:

$$\begin{aligned} \text{FDI}_{it} = & \beta_0 + \beta_1 \text{Inflation}_{it} + \beta_2 \text{Economic Growth}_{it} + \beta_3 \text{Infrastructure}_{it} \\ & + \beta_4 \text{Trade openness}_{it} + \beta_5 \text{Government Effectiveness}_{it} \\ & + \beta_6 \text{Regulatory Quality}_{it} + \beta_7 \text{Political Stability}_{it} \\ & + \beta_8 \text{External Debt}_{it} + \beta_9 \text{Human Capital}_{it} \\ & + \beta_{10} \text{Financial Development}_{it} \\ & + \beta_{11} \text{Control Over Corruption}_{it} \\ & + u_i + v_{it}, \end{aligned}$$

where,  $u_i$  = Individual effect and  $v_{it}$  = Idiosyncratic error term.

Some tests for classical linear regression assumptions were also carried out before using the regression result of fixed effect for discussion. Thus, normality of residuals was tested using Shapiro–Wilk  $W$  test for normal data. The result of the test was insignificant ( $\text{Prob} > z = 0.10099$ ), implying that residuals are normally distributed. Besides, multicollinearity was checked using variance inflation factor. Accordingly, the result revealed absence of multicollinearity problem with mean VIF of 2.11 (less than 10) (Gujariti, 2004). In addition, serial correlation was tested using Wooldridge test for autocorrelation in panel data that hypothesized absence of first order autocorrelation. In light of this, the result ( $\text{Prob} > F = 0.4780$ ) confirmed the null hypothesis. Indeed, autocorrelation was not a problem in the study. Moreover, Modified Wald test for heteroscedasticity in fixed estimator was checked using a user written command. The output ( $\text{Prob} > \text{chi}2 = 0.0001$ ), however, indicated heteroscedasticity problem. Thus, panel robust standard errors were used as solution for presence of heteroscedasticity to make valid statistical inference (Brooks, 2014) (Table 1).

**Table 1** Summary of descriptive statistics

Variable	Mean	Std. Dev	Min	Max
FDI inflow	4.117471	4.084667	0.001843	23.04
Inflation	95.04198	45.39279	0.74	348.9924
Economic growth	6.015349	5.2986	− 1.967729	53.89
Trade openness	57.60455	26.61584	11.41	170.4072
Infrastructure	19.95988	7.737889	2.000441	40.67
Government effectiveness	28.68593	20.57774	0.9478673	81.73
Political stability	30.19916	23.57146	0.5291005	88.57
Regulatory quality	29.22669	19.27386	0.4901961	83.65
Control over corruption	31.47561	20.86742	0.9478673	77.88461
External debt	247.0005	365.8153	11.67037	3128.959
Human capital	45.7218	22.30593	10.08816	97.93816
Financial development	24.20297	23.7592	0.2098308	119.6487

Descriptive statistics were used to describe basic features of the data in this study. This table presents summary statistics for the variables used in the analysis for 17 countries between 2002 and 2016

The results presented in the above table revealed that average foreign direct investment inflows as a percentage of GDP for all countries throughout the study period was 4.117471, a standard deviation of 4.084667, a minimum of 0.001843 scored by Burundi in 2016 and maximum of 23.04 percentage points scored by Djibouti in 2007. Inflation represented by consumer price index had a mean of 95.04198, a standard deviation of 45.39279, a minimum of 0.74 scored by Kenya in 2007 and maximum of 348.9924 percentage points scored by Sudan in 2015. Besides, economic growth of countries had a mean of 6.015349 percent, a standard deviation of 5.2986, a minimum of 1.967729 scored by Sudan in 2011 and maximum of 53.89 percentage points scored by Mauritius in 2016. On average, trade openness of the countries under investigation was 57.60455 percent, a standard deviation of 26.61584, a minimum of 11.41 scored by Mauritius in 2004 and maximum of 170.4072 percentage points scored by Swaziland in 2003.

In addition, government effectiveness represented by an index developed by world governance indicators that incorporates public service quality; effectiveness of the state apparatus; the degree of independence of civil service from political pressures had a mean of 28.68593, a standard deviation of 20.57774, a minimum of 0.9478673 scored by Congo in 2012 and maximum of 81.73 percentage points scored by Mauritius in 2014. Political stability index of the countries under this study had a mean of 30.19916 percent, a standard deviation of 23.57146, a minimum of 0.5291005 scored by Burundi in 2002 and maximum of 88.57 percentage points scored by Mauritius in 2016. On average, index for regulatory quality the countries during the study period was 29.22669 period with a standard deviation of 19.27386, a minimum of 0.4901961 scored by Zimbabwe in 2005 and maximum of 83.65 percentage points scored by Mauritius in 2014. Control over corruption had a mean of 31.47561, a standard deviation of 20.86742, a minimum of 0.9478673 scored by Sudan in 2012 and maximum of 77.88461 percentage points scored by Seychelles in 2015. Accordingly, the ranking of the four institutional and governance variables was generally poor, as it was less than 50 percent, with the highest average being 31.47561 percent for control over corruption during the study period.

**Table 2** Fixed effect regression output

Dependent variable: inflow of foreign direct investment as percentage of GDP				
Independent variables	Fixed-effects (within) regression			
	Coef.	Robust Std. Err.	t	P> t
Cons	− 6.690876	1.795646	− 3.73	0.000
Inflation	0.0021649	0.0020005	1.08	0.281
Economic growth	0.0024137	0.0175018	0.14	0.890
Infrastructure	0.0522313	0.0159253	3.28	0.001
Trade openness	0.0052198	0.0057275	0.91	0.364
Government effectiveness	0.0193232	0.010888	1.77	0.078
Regulatory quality	0.0121991	0.0074781	1.63	0.106
Political stability	0.0049155	0.01078	0.46	0.649
External debt	− 0.0003498	0.0002128	− 1.64	0.104
Human capital	0.0211325	0.0072873	2.90	0.005
Financial development	0.0027036	0.0066638	0.41	0.686
Control over corruption	0.0547151	0.0259236	2.11	0.053
Number of obs = 182				
F(13,154) = 17.48				
Prob > F = 0.0000				
R-squared = 0.7221				
Adj R-squared = 0.6443				

Moreover, external debt had a mean of 247.0005, a standard deviation of 365.8153, a minimum of 11.67037 scored by Mauritius in 2008 and maximum of 3128.959 percentage points scored by Burundi in 2002. Human capital represented by secondary school enrollment as percentage of gross enrollment had a mean of 45.7218, a standard deviation of 22.30593, a minimum of 10.08816 scored by Burundi in 2002 and maximum of 97.93816 percentage points scored by Mauritius in 2014. Financial development represented by host country's domestic credit supply to private sector as percentage of its GDP had a mean of 24.20297, a standard deviation of 23.7592, a minimum of 0.2098308 scored by Congo in 2002 and maximum of 119.6487 percentage points scored by Egypt in 2016 (Table 2).

To see the agglomeration effect, the study also adopted dynamic estimators. In panel estimators, if the regressors include lagged dependent variables, static estimators namely OLS, random effect and fixed effect are inconsistent (Cameron & Trivedi, 2005). The limitation of these static panel estimators could be solved using dynamic panel models as long as dynamic panel data (DPD) model postulates the lagged dependent variable as an explanatory variable. In light of this, Arellano–Bond (1991) and Arellano–Bover (1995)/Blundell–Bond (1998) linear generalized method of moments estimators are popular with short panel (Roodman, 2006). In dynamic panel, the estimators require validity of over identifying restrictions and serially uncorrelated error for consistent estimation (Cameron & Trivedi, 2009). In view of this, Arellano–Bond test for second order zero autocorrelation in first-differenced errors provided no evidence of serial correlation both in Arellano–Bond (difference GMM) and Arellano–Bover/Blundell–Bond (system GMM) estimators (Prob > z = 0.1335 and Prob > z = 0.4616, respectively) though the first order in the difference GMM (Prob > z = 0.0437) confirmed the presence of serial correlation which

is expected. Besides, Sargan test of over identifying restrictions is valid due to insignificant result of the test both in Arellano–Bond (Prob > chi2 = 0.3772) and Arellano–Bover/Blundell–Bond (Prob > chi2 = 0.1388) estimators. Therefore, given that the instruments are valid and absence of autocorrelation, the difference GMM and system GMM dynamic estimators are considered as efficient. In the dynamic model, the lagged net inward FDI is included as an explanatory variable. This entails that there is a correlation between the explanatory variables and lagged error term. In existence of endogeneity and lagged explanatory variable, it's possible to use fixed effect. It, however, provides biased result. The bias could be eliminated if the panel is large. In this study, however, the short panel is applied. In the short panel, dynamic panel estimator removes the country fixed/time-invariant effects by differencing. As a result, any endogeneity that might arise due to correlation of country fixed effects and an explanatory variable is eliminated. Thus, to make it clear, fixed effect can handle lagged if it is long panel only (Nickell, 1981).

To this end, the fixed-effect regression model (Table 3) could be rewritten as:

**Table 3** Statistical result of dynamic panel estimators

Dependent variable	Inflow of foreign direct investment as percentage of GDP							
	Arellano–Bond (difference GMM)				Arellano–Bover/Blundell–Bond (system GMM)			
	Coef	Robust Std. Err.	z	P> z	Coef.	Robust Std. Err.	z	P> z
Constant	− 2.138701	1.924087	− 1.11	0.266	− 0.6743974	2.061217	− 0.33	0.744
Lagged FDI inflow	0.3137243	0.0367564	8.54	0.000	0.3034194	0.0505847	6.00	0.000
Inflation	0.0019212	0.0032045	0.60	0.549	0.0007924	0.003317	0.24	0.811
Economic growth	0.0317134	0.0134614	2.36	0.018	0.0427399	0.0216154	1.98	0.048
Infrastructure	0.0065554	0.0152468	0.43	0.667	0.0370526	0.0223601	1.66	0.098
Trade openness	0.0001151	0.0108668	0.01	0.992	− 0.0099175	0.0071899	− 1.38	0.168
Government effectiveness	0.0192966	0.01145	1.69	0.092	0.020486	0.0132359	1.55	0.12
Regulatory quality	0.0123387	0.0116875	1.06	0.291	0.0136294	0.009877	1.38	0.168
Political stability	0.0166983	0.0149774	1.11	0.265	0.0614924	0.0104705	5.87	0.000
External debt	− 0.0000216	0.000486	− 0.04	0.965	− 0.000483	0.0003881	− 1.24	0.213
Human capital	0.0349112	0.0127291	2.74	0.006	0.0120855	0.0086582	1.40	0.163
Financial development	0.0109205	0.0051319	2.13	0.033	0.01147	0.0063869	1.80	0.073
Control over corruption	− 0.0072138	0.0426637	− 0.17	0.866	0.1152395	0.0576547	2.00	0.046
	Number of obs = 154 Wald Chi2(13) = 1633.65 Prob > Chi2 = 0.0000				Number of obs = 170 Wald Chi2(13) = 9390.30 Prob > Chi2 = 0.0000			
Sargan test of overidentifying restrictions	Chi2(65) = 67.94431 Prob > Chi2 = 0.3772				chi2(78) = 91.62143 Prob > Chi2 = 0.1388			
Arellano–Bond test for zero autocorrelation	1st order, Prob > z = 0.0437 2nd order, Prob > z = 0.1335				1st order, Prob > z = 0.0508 2nd order, Prob > z = 0.4616			

$$\begin{aligned}
 FDI_{it} = & \beta_0 + \beta_1 FDI_{it-1} + \beta_2 Inflation_{it} + \beta_3 Economic\ Growth_{it} + \beta_4 Infrastructure_{it} + \beta_5 Trade\ openness_{it} + \\
 & \beta_6 Government\ Effectiveness_{it} + \beta_7 Regulatory\ Quality_{it} + \beta_8 Political\ Stability_{it} + \beta_9 External\ Debt_{it} + \\
 & \beta_{10} Human\ Capital_{it} + \beta_{11} Financial\ Development_{it} + \beta_{12} Control\ Over\ Corruption_{it} + \epsilon_{it}
 \end{aligned}$$

Empirical findings of the study, both the GMM estimators, revealed that 1 year lagged inflow of foreign direct investment has statistically significant and positive effect on net inflow as percentage of GDP. Thus, investment made by foreigners perpetuates itself and attract better inflows of foreign direct investment. On the other hand, inflation, external debt and regulatory quality of countries under investigation are insignificant in the static as well as dynamic panel results. Indeed, these variables do not affect foreign direct investment inflows to COMESA member countries in the study period. With respect to the nexus between economic growth and inflow of foreign direct investment, both difference and system GMM estimators provide positive and significant relationship though fixed-effect estimator failed to show significant association. The implication here is that countries with slow economic growth provides relatively lower opportunities for making better return on investment than fast growing economies that could provide better chance for making profit for foreign investors. Cognizant of this, the higher the GDP growth rate, the rapid economic growth, the more attractive a country for inflow of foreign direct investment is. Besides, empirical result of difference GMM on the nexus between infrastructure and foreign direct investment inflows provide insignificant output. The fixed effect and system GMM, however, revealed statistically significant positive relationship between the variables. So, countries with efficient infrastructure attract foreign investors that could minimize costs of doing business and increase rate of return. To the contrary of this, poor infrastructural facilities decrease investment inflows by foreigners.

In addition, in the static and system GMM, trade openness is insignificant. However, the difference GMM revealed statistically significant positive effect of trade openness on flow of foreign direct investment. This indicates that countries having better trade partnership with the rest of the world attract multinational companies to invest in their home country as far as the global integration of countries make diffusion of resources easier. Thus, countries with restricted trade policies and lower international trade as percentage of GDP, relatively, discourage multinational companies to make higher investment in host countries compared with countries with higher trade as percentage of GDP. Likewise, statistical results of fixed effect and difference GMM estimators revealed positive linkage between government effectiveness and inflow of foreign direct investment though the result is insignificant in the system GMM. Hence, countries with better quality of public service and lower degree of public service independence from political pressures attract more foreign investors. Moreover, the relation between political stability and foreign direct investment inflow is insignificant in fixed effect and difference GMM though the system GMM revealed statistically significant positive effect of political stability on inflow of foreign direct investment. Lower political stability of countries that may arise due to internal and/or external conflicts, ethnic and/or religious tensions and other means of political instability create unfavorable business climate. This condition, in turn, deters inflow of foreign direct investment by eroding interest of multinational companies. To this effect,

international investors hesitate to bring investment projects until they assure that host countries reduce instability and create conducive and favorable business environment. Contrary to this, it is evident that politically stable countries attract foreign investors by reducing uncertainty and investment risk.

In the same fashion, the fixed effect and difference GMM indicated statistically positive relationship between human capital and foreign direct investment inflows although the system GMM revealed insignificant effect. Thus, a country with better quality of labor force, which is proxied by secondary school enrollment as percentage of gross enrollment, brings higher inflow of foreign direct investment. This is for the fact that skilled labor forces can learn new technologies faster that could bring productivity compared with unskilled labor force. Though static panel estimator provides insignificant result, the dynamic panel data estimators provide statistically significant positive linkage between financial development and foreign direct investment inflows. This indicates that countries with developed domestic financial system attracted multinational companies as long as the system by itself helps foreign investors to raise finance that may broaden investment in the host countries. Finally, control over corruption has statistically significant positive effect on inflow of foreign direct investment as of the static and system panel estimators though the difference estimator revealed insignificant finding. The better control over corruption, the higher the inflow of foreign direct investment will be and vice versa. Indeed, countries with higher control over corruption percentile rank attract foreign investors to make investment in host countries than countries with lower control over corruption percentile rank due to lower reputation.

### **Conclusion and implications of the study**

The aim of the study was to explore factors that determine inflow of FDI to COMESA member countries using panel data estimators. In this regard, empirical evidence of static and dynamic panel estimators revealed that infrastructure, government effectiveness, economic growth, trade openness, political stability, financial development, human capital, control over corruption and lagged inflow of FDI have statistically positive effect on the inflow of FDI. This implies that the member countries have crucial dissimilarities in institutional and economic factors that may significantly affect inflows of FDI. Inflation, external debt and regulatory quality, however, failed to show significant effect in the static as well as dynamic panel results of the study. The study thus underscored the importance of these variables for attracting inflows of FDI. The study showed that each member country of COMESA had different unique features that might attract or discourage inflows of FDI. These results indicate a need for COMESA member Countries to understand and appreciate the role of economic, institutional and governance factors in enhancing inflows of FDI.

The findings of the study suggest the countries for differential implementation of some policies and regulations to take into account their uniqueness. Therefore, member countries of COMESA should take measures to accelerate their economic growth, narrow-up bottlenecks of financial development, improve infrastructural investments, scale-up worldwide trade integration and get better educational policy that could improve human capital quality as long as these factors influence inflows of FDI positively. In the same

fashion, with regard to the governance factors, the countries under investigation should bring better government effectiveness, political stability, and control over practice of corruption to boost-up inflow of FDI that could be used as means of achievement of growth of private sector and sustainable development goals. However, policy measures that have been successful in one country should not be blindly replicated in another since these policies might have differential impacts as long as each member country of COMESA has some unique features that might attract or hinder inflows of FDI.

#### Abbreviations

COMESA	Common Market for Eastern and Southern Africa
FDI	Foreign direct investment
BRICS	Brazil, Russia, India, China, and South Africa
GDP	Gross domestic product
UNCTAD	United Nations Conference on Trade and Development
OLS	Ordinary least squares
GMM	Generalized method of moment

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The author declares that there is no competing interest.

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