THE IMPACT OF FOREIGN CAPITAL AND FINANCIAL RESOURCES ON THE ECONOMIC GROWTH IN THE COMMON MARKET FOR EASTERN AND SOUTHERN AFRICA REGION

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A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF DOCTOR OF PHILOSOPHY IN ECONOMICS, SCHOOL OF ECONOMICS, UNIVERSITY OF NAIROBI.

2018
DECLARATION

Declaration by the Candidate

This thesis is my original work and it has not been presented for a degree in any other university.

Signed____________________________ Date____________________

Peter Kitonyo
(Registration No.: X80/81901/2009)

Declaration by the Supervisors

This is to certify that this thesis has been submitted for examination with our approval as the University Supervisors.

Signed____________________________ Date____________________

Professor Tabitha Kiriti-Ngángá

Signed____________________________ Date____________________

Dr. Daniel Okado Abala
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DEDICATION

In honor of my parents, the late Mr. Michael Kitonyo Matu and Mrs. Juliana Mukela Kitonyo.
ACKNOWLEDGEMENT

I wish to thank God for the gift of life and according me grace to complete this thesis at this point in time. The way was long, but since it was the only way, it was the shortest.

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The suggestions and comments notwithstanding, I bear responsibility for the findings, interpretations and conclusions expressed in this thesis and any errors and omissions are entirely my own and not attributable to any institution.
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<tbody>
<tr>
<td>AB</td>
<td>Arellano and Bond (1991) generalized method of moments</td>
</tr>
<tr>
<td>AfDB</td>
<td>African Development Bank Group</td>
</tr>
<tr>
<td>AID</td>
<td>Agency for International Development</td>
</tr>
<tr>
<td>ARDL</td>
<td>Autoregressive dynamic lag</td>
</tr>
<tr>
<td>AREAER</td>
<td>Annual Report on Exchange Arrangements and Exchange Restrictions</td>
</tr>
<tr>
<td>BB</td>
<td>Blundell and Bond (1998) generalized method of moments</td>
</tr>
<tr>
<td>BEP</td>
<td>Break-even point</td>
</tr>
<tr>
<td>COMESA</td>
<td>Common Market for Eastern and Southern Africa</td>
</tr>
<tr>
<td>CPI</td>
<td>Consumer price index</td>
</tr>
<tr>
<td>CPIA</td>
<td>Country Policy and Institutional Assessment</td>
</tr>
<tr>
<td>DAC</td>
<td>Development Assistance Committee</td>
</tr>
<tr>
<td>DPD</td>
<td>Dynamic panel data</td>
</tr>
<tr>
<td>EPZ</td>
<td>Export Processing Zone</td>
</tr>
<tr>
<td>FC</td>
<td>Foreign capital</td>
</tr>
<tr>
<td>FDI</td>
<td>Foreign direct investment</td>
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<tr>
<td>FE</td>
<td>Fixed effect</td>
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<tr>
<td>FPI</td>
<td>Foreign portfolio investment</td>
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<tr>
<td>FPE</td>
<td>Foreign portfolio equity</td>
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<tr>
<td>GFCF</td>
<td>Gross fixed capital formation</td>
</tr>
<tr>
<td>GLS</td>
<td>Generalized least squares</td>
</tr>
<tr>
<td>GMM</td>
<td>Generalized method of moments</td>
</tr>
<tr>
<td>GNI</td>
<td>Gross national income</td>
</tr>
<tr>
<td>GNP</td>
<td>Gross national product</td>
</tr>
<tr>
<td>GRETIL</td>
<td>Gnu Regression, Econometrics and Time-Series Library</td>
</tr>
<tr>
<td>HDI</td>
<td>Human Development Index</td>
</tr>
<tr>
<td>IBRD</td>
<td>International Bank for Reconstruction and Development</td>
</tr>
<tr>
<td>ICRG</td>
<td>International Country Risk Guide</td>
</tr>
<tr>
<td>IDA</td>
<td>International Development Association</td>
</tr>
<tr>
<td>IDI</td>
<td>Inclusive development index</td>
</tr>
<tr>
<td>IFC</td>
<td>International Finance Corporation</td>
</tr>
<tr>
<td>IHDI</td>
<td>Inequality-adjusted Human Development Index</td>
</tr>
<tr>
<td>IV</td>
<td>Instruments variables method</td>
</tr>
<tr>
<td>IV-GMM</td>
<td>Instrument variables-generalized method of moments</td>
</tr>
<tr>
<td>IFS</td>
<td>International Financial Statistics</td>
</tr>
<tr>
<td>IMF</td>
<td>International Monetary Fund</td>
</tr>
<tr>
<td>LDC</td>
<td>Less developed country</td>
</tr>
<tr>
<td>LOANS</td>
<td>Cross-border bank lending</td>
</tr>
<tr>
<td>LSDV</td>
<td>Least squares dummy variable estimator</td>
</tr>
<tr>
<td>LSVC</td>
<td>Bias-corrected least squares dummy variable estimator</td>
</tr>
<tr>
<td>M&amp;A</td>
<td>Mergers and Acquisitions</td>
</tr>
<tr>
<td>MPS</td>
<td>Marginal propensity to save</td>
</tr>
<tr>
<td>ODA</td>
<td>Overseas development assistance</td>
</tr>
<tr>
<td>OECD</td>
<td>Organization for Economic Co-operation and Development</td>
</tr>
<tr>
<td>POLS</td>
<td>Pooled ordinary least squares</td>
</tr>
<tr>
<td>PPP</td>
<td>Purchasing Power Parity</td>
</tr>
<tr>
<td>PRS</td>
<td>Political Risk Services Group</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>Research and development</td>
</tr>
<tr>
<td>RE</td>
<td>Random effect</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>SDR</td>
<td>Special drawing rights</td>
</tr>
<tr>
<td>2SLS</td>
<td>Two-Stage Least Squares</td>
</tr>
<tr>
<td>SNA</td>
<td>System of National Accounts</td>
</tr>
<tr>
<td>SSA</td>
<td>Sub-Saharan Africa</td>
</tr>
<tr>
<td>TI</td>
<td>Transparency International</td>
</tr>
<tr>
<td>UNCTAD</td>
<td>United Nations Conference on Trade and Development</td>
</tr>
<tr>
<td>UNESCO</td>
<td>United Nations Educational, Scientific and Cultural Organization</td>
</tr>
<tr>
<td>UNDP</td>
<td>United Nations Development Programme</td>
</tr>
<tr>
<td>WB</td>
<td>World Bank</td>
</tr>
<tr>
<td>WDI</td>
<td>World Development Indicators</td>
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<tr>
<td>WEF</td>
<td>World Economic Forum</td>
</tr>
<tr>
<td>WEO</td>
<td>World Economic Outlook</td>
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<tr>
<td>WGI</td>
<td>World Governance Indicators</td>
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ABSTRACT

The Common Market for Eastern and Southern Africa (COMESA) region has experienced fast economic growth coupled with increased flows of foreign capital and financial resources since 2000. However, the link between economic growth, foreign capital, financial resources and absorptive capacity in the region is not clear: few studies have been conducted in the region, others have omitted some COMESA countries, components of foreign capital/financial resources and absorptive capacity from their analysis. Furthermore, previous studies conducted in other regions obtain conflicting results. This study seeks to determine the impact of foreign capital and financial resources on the real GDP per capita and examine how this impact is affected by the absorptive capacity in the COMESA region. It also explores the effect of applying different estimators on the regression results. The study uses country-level panel data covering the period from 2000 to 2015. Panel data estimators are used to generate regression results. The dynamic generalized method of moments (GMM) difference estimator produces reliable, efficient and robust estimates. According to the results, GDP growth in the COMESA region is driven by aggregated foreign capital and financial resources. Short term foreign capital flows, cross-border bank lending, remittances, overseas development assistance and aid affect growth positively, while FDI has a negative impact. Absorptive capacity too drives economic growth and enhances the ability of the region to absorb and benefit from the spillovers of foreign capital and financial resources. However, the absorptive capacity has a minimum threshold for the region to realize a positive impact of foreign capital and financial resources on GDP growth. The findings suggest that the COMESA countries should encourage and promote greater inflow of foreign capital and financial resources. The countries should also adopt FDI targeting and implement economic policies that encourage inflows of beneficial FDI. Finally, they should improve the absorptive capacity in order to realize positive GDP growth from aggregated and disaggregated foreign capital and financial resources.
CHAPTER ONE: INTRODUCTION

1.0 Background of the Study

All countries, developed and developing alike, seek to achieve high levels of economic growth so as to raise the standards of living for their nationals. They allocate enormous resources and enact relevant policies to achieve this objective. Some of the economic policies include liberalization of interest rates and the exchange rate, removal of import controls, and relaxation of capital controls\(^1\), among others. According to the growth theory, besides labor and technological progress, the other key input is capital, which could be accumulated or formed through either domestic or foreign investment. The latter type of capital investment is usually financed by different types of the foreign capital and financial resources.

Forms of foreign capital includes foreign direct investment (FDI), portfolio investment (FPI), equity and bond issuance or debt securities, cross-border bank lending (also debt), overseas development assistance (ODA) and official aid, while foreign financial resources consist of remittances (World Bank, 2017; International Monetary Fund, 2017; Bank of International Settlements, 2017).

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 takes the form of international joint ventures related to mergers\(^2\). Foreign debt/equity swaps are captured under either mergers and acquisitions transactions type of FDI or portfolio investment. FDI is further classified into market-seeking, resource-seeking and efficiency-seeking types. The market-

\(^1\) Kenya liberalized interest and exchange rates, relaxed the capital account and removed import controls in 1990s. Other COMESA countries are at different stages of the implementing these policies.

\(^2\) 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.
seeking or horizontal FDI seeks access to attractive new markets in the host countries that are large in size, have potential of growth or a blend of both large size and growth potential. The resource-seeking, or vertical or export-oriented FDI seeks to obtain raw materials, workforce and infrastructural resources and exploit natural resources including minerals, oil and gas, among others. One of the most important resource-seeking FDI is the strategic-asset seeking type that is based on man-made assets such as highly-skilled workforce, strong images and brand names or big shares in certain markets. The efficiency-seeking FDI taps benefits of special characteristics in a certain area including the lower costs of labor and high productivity of the local workforce, low costs of doing business and highly-competitive infrastructure (Campos & Kinoshita, 2003; Lim, 2001).

Another important component of foreign capital is portfolio investment. This is described by ownership of less than 10% of equity shares in a business enterprise with operations in an economy different from that of the investor.

Remittances are unrequited transfers, sent from abroad by migrants back to family relations and friends in their nation of origin. According to the International Monetary Fund (2005), remittances are generally constituted by three components, namely employees ‘compensation (a part of current account income), worker’s remittances (a type of current account transfer) and migrants’ transfer (a capital account component). Remittances are also seen as current private transfers from migrant workers residing in a foreign country to recipients in their nation of origin. The migrants who reside in the host nation for a calendar year or longer period are regarded as residents, their status of immigration notwithstanding (IMF, 2005). The income earned by the migrants who have resided in the host nation for a period of less than a year is classified as employees’ compensation. The transfers by the migrants are seen as financial transactions arising from the residence change of people from one nation to another. In this study, remittances are regarded as personal transfers and employees’ compensation. The migrant transfers, a capital account component, are not regular and data is unavailable for some countries, years or both. Though they are investible, remittances are not capital by design. Excluded from FDI and portfolio investment are the short-term foreign capital flows (STFCF), represented by the sum of the net short-term capital, net errors and omissions and capital transactions.
Foreign capital and financial resources have been considered important in influencing economic growth in recipient countries. They contribute positively to growth both directly and indirectly through provision of capital required for investment and increase of resources for education, health and human capital development in the host countries (Amuedo-Dorantes, Georges & Pozo, 2008; Jongwanich, 2007; Gitter & Barham, 2007). They are therefore perceived to be able to resolve major challenges such as shortage of skills, technology and financial resources (Todaro & Smith, 2003). Due to the potential benefits associated with the foreign capital and financial resources, many developing countries, including those in the COMESA region, have sought to attract more foreign capital and financial resources, by reforming their economies to promote efficiency and growth (Ronge & Kimuyu, 1997). Other developing countries in Africa, including Kenya, Mauritius, Rwanda, Seychelles and Uganda have strengthened their macroeconomic performance, enacted effective economic policies, improved institutional environment and have provided incentives to attract increased flow of foreign capital and financial resources (Mwega & Ngugi, 2007).

Foreign capital and financial resources flows to the COMESA region (FDI, short-term foreign capital flows and banks’ total foreign claims) increased, while remittances, overseas development assistance and official aid fell slightly during the 2000-2015 period (Bank of International Settlements, 2017; International Monetary Fund, 2017; United Nations Conference on Trade and Development, 2017; World Bank, 2017). The reported increase in the inflows of foreign capital and financial resources is attributed to abundant global liquidity experienced between 2000 and 2007 and an increasing number of investors looking for high yielding investment opportunities in

3 The member states of the COMESA region comprises: Burundi, Comoros, Djibouti, DR Congo, Egypt, Eritrea, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, South Sudan, Sudan, Swaziland, Uganda, Zambia and Zimbabwe.

4 The reforms include fiscal and monetary policies, liberalization of trade and exchange rates, external debt policies, privatization, public sector management and financial sector reforms and harnessing regionalism, among others.

5 Economic policies include liberalization of interest rates, the exchange rates, removal of price controls and import controls and relaxation of capital controls.

6 The incentives include among others tax holidays, accelerated depreciation allowances, exemption for import duties on machinery and equipment, investment allowances, arrangements for profit repatriation, non-restriction of management or technical agreements and subsidies.
the COMESA region (Macias & Massa, 2009). The region also realized robust rates of economic growth from 2000, propped by high exports and increased private consumption. The region realized highest growth rates of 3.9% in 2007 and 8.3% in 2012 (World Bank, 2017).

Many empirical studies have been conducted to determine the benefits of foreign capital and financial resources. However, the studies do not yield conclusive evidence on the impact of foreign capital and financial resources on the GDP growth of host economies. Some studies find either a positive impact (Willmore, 1986; Blomström, 1998; Bekeart & Harvey, 1998; Gheeraert & Mansour, 2005; Macias & Massa, 2009; Gomanee et al., 2002); negative impact (Choong et al., 2009; Durham, 2003; Burnside & Dollar, 2000; Chami et al., 2005) or indeterminate impact on growth. It has also been suggested that the impact of foreign capital and financial resources on economic growth, depends on whether the host economy has attained the required minimal level of absorptive capacity indicated by factors such as human capital, technological diffusion, economic openness, quality of public infrastructure, financial sector development, corruption, legal system development and sound macroeconomic policies, that allow it to exploit the benefits of spillovers of aggregated and disaggregated foreign capital and financial resources (Alfaro, Chanda, Kalemli-Ozcan & Sayek, 2004; Aschauer, 1989; Barro & Sala-i-Martin, 1995; Balasubramanyam, Salisu & Sapsford, 1996; Blomström, Lipsey & Zegan, 1994; Borensztein, de Gregorio & Lee, 1998; Durham, 2004; Edison, Levine, Ricci & Sløk, 2002). To the best of our knowledge very few similar studies have been carried out in the COMESA region.

This study therefore establishes whether the aggregated and disaggregated foreign capital and financial resources impact positively or negatively on the gross domestic product growth in the region. The study enriches the knowledge on the link between the aggregated and disaggregated foreign capital and financial resources and GDP growth in the COMESA region and identifies the policy levers that may be used to maximize the volume of flows of foreign capital and financial resources and the gains derived from them. It also establishes the effect of absorptive capacity in enhancing or deterring the growth impact of foreign capital and financial resources.

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7 Choong et al. (2009), Combes, Kinda, Ouedraogo and Plane (2017), Macias and Massa 2009 and Ndoricimpa (2009), among others.
1.1 Importance of Foreign Capital and Financial Resources on Economic Growth

Foreign capital and financial resources flows can raise economic activity of the host country directly by raising overall local investment and by raising the quality and efficiency of investment (Lovrinčević, Marić & Mikulić, 2015). Raising the efficiency of local investment relates to the technological innovations transfer, a characteristic mainly associated with FDI. Foreign capital and financial resources flows can also increase levels of economic activity of the recipient country via the effect of spillovers, whereby raising investment and efficiencies of one sector or industry leads other sectors or industries to improve and innovate (Prasad, Rogoff, Shang-Jin & Kose, 2003).

Foreign capital and financial resources can stimulate the financial sector development of host country and its integration in the international financial markets (Lovrinčević et al., 2005). The authors found that there is evidence that financial development stimulates growth. The integration in the foreign markets of capital and the flow of foreign capital and financial resources enables improved risk management between the domestic and foreign investors. Foreign capital facilitates smoothing of consumption, increased specialization and comparative advantages of a host country. Combes, Kinda, Ouedraogo and Plane (2017) argued that overall foreign capital and financial resources inflows are associated with higher economic growth after netting out the negative impact of real exchange rate appreciation, while Ali (2012) observed that they improve social welfare, boost savings and increase foreign exchange reserves.

However, when the foreign capital and financial resources are moved with intentions inconsistent with economic fundamentals, they lead to economic volatility (Bordo & Meissner, 2007). Moreover, inefficient allocation of funds may not obtain the expected theoretical outcome (Collier & Dollar, 2002). Combes et al. (2017) and Ali (2012) contended that foreign capital and financial resources appreciate the real exchange rate and increase general price levels, respectively.

FDI could close the gap between desired investment and savings mobilized from domestic sources, increase tax revenues (Hayami, 2001; Todaro & Smith, 2003), improve management and
workforce skills and develop human capital (Adams, 2009; World Bank, 2000), facilitate acquisition and transfer of modern technology (Adams, 2009), expand foreign production networks, improve integration of foreign trade and accord greater access to international markets (Findlay, 1978; Jenkins & Thomas, 2002; Mwilima, 2003).

FDI is a source of employment in host economies. Ajayi (2005) argued that employment is created in three ways. First, employment is directly created for operations in the local economy. Second, employment is created via backward and forward linkages. This is seen in cases where employment is created in businesses that are suppliers of inputs, subcontractors and service providers. Third, employment is also created via higher economic growth rates that lead to generation of employment opportunities.

FDI is a key supplier of capital formation particularly in economies where the capital base is large. According to Adams (2009), foreign capital net inflow provides a means of creating a surplus balance in the capital account or to close the deficit on the balance of payments’ current account. However, the author also noted that there are cases where FDI has not resulted to capital formation but instead crowded out local investment.

Increased inflow of FDI is usually associated with technology transfer. This is because foreign corporations are expected to utilize technology from their parent country. For development to occur, it is important that technology is diffused with spillover into the domestic production systems and adopted and adapted by domestic businesses enterprises (Adams, 2009). In order for the economy to improve on quality, it is important to upgrade on technology. Indeed, technical inefficiency can be a serious hindrance to the quality of products produced in developing countries and adversely affect the ability to cope with new demands. On the contrary, the author argued that foreign direct capital leads to competition that tends to stifle growth of domestic technology and allocate more resources to attracting FDI as compared to development of technology.

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8 Adams (2009) argued that the transfer of skills to domestic managers occurs when investors establish new plants, acquire corporations and outsource to domestic subcontractors.
It has also been argued that the benefits of FDI on host economies are overrated. For example, increased FDI is expected to lead to creation of employment. There is evidence pointing out that foreign direct investment is sometimes accompanied by small creation of employment and in most cases results to loss of jobs particularly when public corporations are privatized. For example, in Namibia, Adams (2009) noted that most foreign direct investment moved to the mining industry resulting in reduction of its workforce from 14,000 to 5,000 in only 12 years. Another challenge with creation of employment via increased inflows of FDI is the type of employment created. In Namibia, for instance, the government observed that the Export Processing Zone (EPZ) program created more jobs and brought down the rate of unemployment. However, it was also observed that the jobs created are mostly characterized by poor working environment and low salaries. Most of the employees neither had job security nor high prospects of improving their living standards.

FDI may increase competitiveness in exports. This is achieved by developing local corporations to produce quality goods and services for competitive export markets. This was a critical objective for the establishment of the Growth, Employment and Redistribution (GEAR) strategy by South Africa. The strategy focused on attracting investment in clusters of industries, an initiative aimed at developing domestic corporations. However, Adams (2009) showed that it did not achieve the desired effect on employment creation and capital formation.

There is evidence that FDI does not catalyze the growth process in Africa. For instance, Sun (2002) pointed out that the FDI can crowd-out domestic investment, lead to balance of payments challenges and create the enclaves economy. FDI crowds out domestic capital when the foreign investors benefit from investment opportunities meant for the local investors (Sun, 2002). The challenges of balance of payments as a result of FDI arise when profits repatriated by foreign corporations comprise a capital outflow that are more as compared to the net annual contribution of inflows of FDI reported in the account of the balance of payments of the recipient economy (Sun, 2002). However, this issue is not of much concern with the liberalization of capital and current accounts. There is no evidence for Africa to indicate that FDI leads to a negative external balance and is not able to lead to problems of balance of payments except in economies where the exchange rates are not properly aligned (Ajayi, 2006; Sun, 2002). Finally, FDI may lead to the enclave economies. This occurs when FDI has limited overall impact on the economic growth of
recipient economies and benefit only a few members of the population. There are mainly two areas where enclave economies are created by FDI: mining and other projects involved in raw material extraction. In the first area, investment is usually capital intensive and only a small proportion of the citizens are part of the workforce. This outcome means that few linkages occur, resulting into negligible indirect impacts on the economy. The second example of the enclave economy is the Export Processing Zone (EPZs). The Export Processing Zones exhibit limited linkages with the domestic economy owing to the amount and type of concessions and special privileges accorded for location in this zone (Ajayi, 2006).

FDI may take the place of the local firms and consequently reduce the local welfare when opened up in the research and development sector due to the repatriation of financial returns to foreign corporations (Reis, 2001). In this case, the growth effects of FDI are subject to the relative size of the effects of interest rates. The author argued that, in a case where the domestic interest rate is lower than the world interest rate, FDI can have a negative growth effect by raising capital outflows and reducing the funds available for investment in the domestic economy, while if the local interest rate is higher than the world rate of interest, foreign direct investment would have a positive effect on growth through increased capital inflows.

Firebaugh (1992) advanced 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.

Other scholars such as Ugochukwu, Okore and Onoh (2013) argue that foreign direct investment can adversely affect growth in the host country by crowding out local enterprises and promoting inappropriate patterns of consumption, whereas Mwega and Ngugi (2007) argued that FDI can reduce domestic savings rate and the rate of local investment by stifling competition through exclusive production contracts with the recipient country. The latter authors also pointed out that FDI may also contribute to less than optimal corporate taxes where they are provided with tax concessions that are liberal and excessive investment allowances and subsidies, tariff protections
and other monetary incentives. Overall, it is generally believed, however, that FDI provides net benefits to the host country (Findlay, 1978; Todaro & Smith, 2003; Hayami, 2001; Jenkins & Thomas, 2002; World Bank, 2000).

Foreign portfolio equity and debt such as portfolio bond issuance and cross-border bank lending are believed to contribute to economic growth in recipient nations. Equity flows increase the rate of domestic investment whereas bond issuance and cross-border lending provide funds for investment and promote growth (Durham, 2004). However, these private capital and financial resources might incur losses in welfare to host economies owing to distortion of patterns of production and consumption. For instance, in cases where there are problems of moral hazard⁹, local lenders could engage in excessive lending funded by funds from abroad, which may have negative effects on economic development (McKinnon & Pill, 1997). The lenders are unable to manage credit risks effectively and control the poor investment behavior of the loanees. In turn, Calvo (1998) added that adverse changes in foreign capital might lead to bankruptcies, jeopardize domestic channels of credit and thereby make domestic human capital stock obsolete.

The short-term foreign capital flows and capital transactions also contribute to growth in recipient countries. The short-term foreign capital flows provide foreign exchange that can be invested in productive activities and capital transactions boost the investment levels in the host nations. Conversely, empirical evidence by Reisen and Soto (2001) also shows that abrupt reversal of short-term capital flows can generate output losses and bankruptcies. Additionally, Baharumshah and Thanoon (2006) showed that short-term foreign capital slowed down economic growth during the rise and sudden short-term foreign capital flows reversals in the emerging economies of Asia.

Literature has shown that ODA and official aid can promote GDP per capita. The theoretical foundation for the proposition is based on the 2-gap model. The model focuses on two constraints: the need for savings to fund investment, and the need for foreign exchange to fund imports (Iyoha, 2001). It advances the argument that growth may be hindered by the presence of the gaps in the

⁹ Moral hazard is the asymmetry in information where one party is unable to control the behaviour of the other party after a transaction. In the case of loans market, it is where the lenders are not able to manage credit risks better due to their inability to control the poor investment behaviour of loanees.
savings and foreign exchange in the developing economies. The savings gap arises because domestic savings are low consequently falling short of the required investment while the foreign exchange gap exists because most developing economies run surpluses in imports or experience deficits in their balance of payment accounts owing to overdependence on primary commodity exports, instability in exports and shocks transmitted across international borders. Foreign savings in terms of aid flow can therefore fill these gaps.

The proponents of foreign aid, on the one hand, posit that net inflow of overseas development assistance and official aid is important for economic growth in the developing countries. They further argue that ODA and official aid is positively related to economic growth as it supplements domestic savings and complements domestic resources. For instance, researchers including Chenery and Strout (1966), Papanek (1973), Over (1975), Levy (1988) and Islam (1992) among others argue that ODA and foreign aid fill the foreign exchange gap, provides access to managerial skills and modern methods of production and allow easier access to large exotic markets. ODA and aid facilitate transfer of wealth from the rich developed nations to the poor underdeveloped nations (Chatterjee & Turnosky, 2005).

The opponents of aid, on the other hand, argue that ODA and external aid exhibits significant negative impacts on the growth of the host nations. This occurs when external aid is consumed, consequently substituting rather than complementing domestic resources. Additionally, Boone (1994), Easterly (1999) and Griffin and Enos (1970) argued that external aid facilitates the importation of inappropriate technology, distorts the income distribution in the domestic economy and encourages establishment of big, corrupt and inefficient governments in developing countries. According to Boone (1994) aid negatively affects domestic savings and economic growth in less developed countries.

A number of mechanisms through which remittances can influence GDP per capita have been identified in the literature. Scholars including Amuedo-Dorantes and Pozo (2006) and Woodruff and Zenteno (2007) argued that remittances promote GDP per capita growth rate of host countries through provision of additional foreign exchange and finance for business investment. According to Amuedo-Dorantes, Georges, and Pozo (2008), Edwards and Ureta, (2003) and Gitter and
Barham (2007), remittances promote economic growth by improving human capital development through increasing resources for health, social welfare and education. Remittances also have the ability to reduce macroeconomic volatility consequently encouraging greater investment in the domestic economy (Barajas, Chami, Fullenkamp, Gapen, & Montiel, 2009). They also shore up current account. On the other hand, remittances may exert a limited effect on economic growth if they are spent on consumption instead of investment. They can also reduce economic growth by inducing appreciation in the real exchange rates (Combes et al., 2017). Remittances directly complement household income and could therefore decrease economic growth and domestic output by decreasing labour effort and labour supply (Jongwanich, 2007).

Overall, the foreign capital and financial resources flows are expected to provide net benefits to the host country. This view is also supported by the extensive discussion of the importance of the foreign capital and financial resources in economic performance in the literature.

1.2 Overview of the Flow of Foreign Capital and Financial Resources to the COMESA Region

The COMESA countries receive foreign capital and financial resources from different sources including but not limited to international and regional organizations such as the Organization for Economic Co-operation and Development (OECD), Agency for International Development (AID); International Monetary Fund, the World Bank (IBRD) and its affiliates, the International Finance Corporation (IFC) and the International Development Association (IDA); the African Development Bank Group (AfDB), and multinational corporations, among others. This study does not however specify the particular sources of these resources but considers all of them put together.

To analyze the link between economic growth, foreign capital and financial resources, an overview of the economic growth realized in the COMESA region and foreign capital and financial resources flows to the region is presented in Table 1.1 as five-year averages from 2000 to 2015\textsuperscript{10}. It also indicates the averages over the 1990 to 1999 period in order to compare with changes after 2000.

\textsuperscript{10}The averages are represented by 2000 to 2004, 2005 to 2009 and 2010 to 2015.
Table 1.1: Economic Growth, Foreign Capital and Financial Resources Flows to the COMESA Region, 2000-2015

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<tr>
<td>GDP per capita growth (Annual %)</td>
<td>0.39</td>
<td>0.46</td>
<td>2.45</td>
<td>2.79</td>
<td>1.90</td>
</tr>
<tr>
<td>Foreign direct investment (% of GDP)</td>
<td>18.92</td>
<td>24.47</td>
<td>27.22</td>
<td>35.38</td>
<td>29.02</td>
</tr>
<tr>
<td>Short term foreign capital flows (% of GDP)</td>
<td>6.89</td>
<td>9.21</td>
<td>8.55</td>
<td>10.09</td>
<td>9.28</td>
</tr>
<tr>
<td>Cross-border bank lending (% of GDP)</td>
<td>7.61</td>
<td>11.47</td>
<td>15.75</td>
<td>21.01</td>
<td>16.08</td>
</tr>
<tr>
<td>Overseas development assistance and aid (% of GDP)</td>
<td>8.39</td>
<td>11.18</td>
<td>10.12</td>
<td>7.84</td>
<td>9.71</td>
</tr>
<tr>
<td>Remittances (% of GDP)</td>
<td>2.16</td>
<td>4.22</td>
<td>2.46</td>
<td>2.54</td>
<td>3.07</td>
</tr>
<tr>
<td>Aggregated foreign capital and financial resources (% of GDP)</td>
<td>10.56</td>
<td>12.11</td>
<td>12.82</td>
<td>15.37</td>
<td>13.43</td>
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Table 1.1 show that the COMESA region experienced slow economic growth given by 0.39% over the period 1990-1999. However, it has experienced high economic growth rate since 2000, realizing highest growth rates of 3.9% in 2007 and 8.3% in 2012 (IMF, 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 GDP growth of 1.8% realized in the advanced economies during the same period. Macias and Massa (2009) explained that the high growth rates witnessed in the sub-Saharan Africa in mid-2000s, which includes most of the countries of the COMESA region, was due to high volume of exports and increased private consumption.

Most of the foreign capital and financial resources flows into the COMESA region have also increased since 2000, including FDI, short term foreign capital flows and banks’ total foreign claims (see Table 1.1). However, remittances, ODA and aid fell slightly during the period. The data for foreign portfolio investment, foreign portfolio equity and bond issuance/securities is
unavailable for most countries and many years\textsuperscript{11}. Consequently, portfolio investment is excluded from the study owing to lack of data.

The reported increase in the flows of foreign capital and financial resources to the region was mainly due to ample global liquidity witnessed from 2000 to 2007 coupled with an increase in the number of foreign investors looking for high yielding investment opportunities who were attracted to the COMESA region (Macias & Massa, 2009). Several factors attracted investors to the COMESA region (Macias & Massa, 2009). (1) Many COMESA countries including Kenya, Mauritius, Rwanda and Seychelles, among others, made their macroeconomic performance stronger and carried out economic reforms, resulting into fiscal consolidation\textsuperscript{12}, decreased deficits, decreased rates of inflation and improving the environment of doing business. (2) The region experienced political stability\textsuperscript{13}. Most of the COMESA countries are peaceful, except Egypt and Libya where political instability set in with the series of protests and demonstrations across the Middle East and North Africa that commenced in 2010. (3) The COMESA region is rich in natural resources, minerals, oil and gas consequently attracting the fast growing markets in the emerging economies such as China. Some of the top destinations of Chinese investment include Zambia, DR Congo, Zimbabwe, Ethiopia and Sudan, among others (Chen et al., 2015). (4) Beneficial foreign factors such as the commodities boom that ended in 2008 and the debt relief added to the attractiveness of the COMESA region to foreign investors.

FDI stock is the value of the share of the foreign investors’ capital and reserves (including retained profits) attributable to the parent enterprise, plus the net indebtedness of affiliates to the parent enterprises (UNCTAD, 2017). Table 1.1 show that the net FDI stocks going to the COMESA region were low averaging 18.9% of GDP over the 1990-1999 period. However, they have increased since 2000 and were relatively robust up to 2008, dropped steadily after 2009, before

\textsuperscript{11} Data for portfolio investment, both equity and debt securities, was not available for the entire period of study (2000-2015) for Burundi, Djibouti, Eritrea, Ethiopia, Madagascar and Zimbabwe. Additionally, similar data was unavailable for the rest of the countries for the period from 2000 to 2004.

\textsuperscript{12} Fiscal consolidation is a policy aimed at reducing government deficits and debt accumulation.

\textsuperscript{13} Chen, Dollar and Tang (2015) showed that Eritrea, Madagascar, Zambia and Zimbabwe have attracted Chinese investment owing to political stability.
starting to rise again. Macias and Massa (2009) argued that the reduction in FDI was caused by lowered capability and investment propensity. The authors noted that credit conditions became tighter in 2007 to 2008, making it hard and dear to invest in exotic operations. They also added that the slowdown of economic growth world over coupled with raised aversion to risk decreased the appetite for risk by the investors.

The net FDI stocks as a share of GDP averaged 29.0% over the 2000-2015 period. They rose 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. In fact, 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 (UNCTAD, 2017). However, during the same period, Burundi and Comoros reported the least net FDI stocks, perhaps due to political instability, weak governance structures and poor economic performance.

Table 1.1 also shows that the sum of the net short-term capital and capital transactions averaged 6.9% of GDP over the 1990-1999 period but have grown since 2000. The net short-term foreign capital flows as a percentage of GDP averaged 9.3% over the 2000-2015 period. They rose from negative 2.5% of GDP in 2000 to positive 5.5% of GDP in 2015 (World Bank, 2017). However, the flows fell to negative levels between 2004 and 2007 before rising steadily after 2007. The growth in the first half of the period under study was slightly less than the growth in the last half of the study period.

Foreign banking activity in the COMESA region was low prior to 2000 but have grown tremendously since 2000. Table 1.1 shows that the ratio of total foreign claims to GDP held by all commercial banks in the COMESA countries that report to the Bank for International Settlements (BIS) averaged 7.6% between 1990 and 1999. However, it rose from 8.9% in 2000 to 23.8% in 2015 (BIS, 2017). The Table shows that the said share averaged 16.1% over the sixteen years covered by this study.

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14Total foreign claims represent commercial banks’ cross-border claims and foreign offices’ domestic claims in all currencies.
The overseas development assistance (ODA) and official foreign aid flows to the COMESA region fell slightly over the period from 2000 to 2015. Table 1.1 shows that the average ODA and official aid as a percentage share of GDP averaged 8.4% between 1990 and 1999 and 9.7% over the sixteen years covered by this study. It went up from 9.0% in 2000 to 13.6% in 2003 before it started falling (World Bank, 2017). It also remained above 10.0% between 2002 and 2006 and by 2015 it had fallen to 6.8%. Five countries attracted much ODA and official aid to the COMESA region between 2000 and 2015: they include Ethiopia, D.R Congo, Egypt, Kenya, Uganda, Sudan, Zambia and Malawi (World Bank, 2017).

Table 1.1 shows that the average remittances receipts as a percentage of GDP fell from 4.8% to 2.4% over the 2000-2015 period (World Bank, 2017). However, it averaged 3.1% of GDP over the sixteen years covered by this study as compared to 2.2% between 1990 and 1999. The countries that contributed greatly to the overall remittances between 2000 and 2015 include Egypt, Sudan, Kenya, Uganda, Ethiopia, Malawi and Comoros (World Bank, 2017). This could be attributed to a big population of migrants in foreign countries, low costs of receiving remittances or political instability in countries such as Egypt.

The aggregated foreign capital and financial resources (AFCFR) is made up of sum of FDI\(^{15}\), short term foreign capital flows, cross-border bank lending, overseas development assistance (ODA), aid and remittances received from abroad expressed as a percentage of the GDP\(^{16}\).

Table 1.1 shows that the aggregated foreign capital and financial resources as a percentage of GDP averaged 10.6% between 1990 and 1999. It however grew from 8.2% in 2000 to 14.6% in 2015. The average aggregated foreign capital and financial resources over the 2000-2015 period is 13.4%. Between 2000 and 2015 some six countries attracted average aggregated foreign capital and financial resources of above 10.0% of GDP to the COMESA region: they include Seychelles (55.3% of GDP), Djibouti (16.3% of GDP), Zambia (14.6% of GDP), Malawi (13.6% of GDP),

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\(^{15}\) FDI is measured by changes in net FDI stocks to convert the stock into a flow variable and facilitate aggregation.

\(^{16}\) The data for foreign portfolio investment is not available for Burundi, Djibouti, Eritrea, Ethiopia, Madagascar and Zimbabwe and the rest of the COMESA countries for the period between 2000 and 2005. Hence, the investment is excluded from the aggregation.
Eritrea (10.6% of GDP) and Mauritius (10.5% of GDP). The rest of the countries realized average aggregated foreign capital and financial resources of below 10.0% of GDP. The least average aggregated foreign capital and financial resources as a percentage of GDP was received by Rwanda (5.2% of GDP), Kenya (5.8% of GDP) and Libya (6.1% of GDP) (BIS, 2017; World Bank, 2017; UNCTAD, 2017).

The increase in foreign capital and financial resources flows to the COMESA region over the period of the study might have the possibility of carrying key opportunities for the region. For instance, they can allow host economies to bridge the gap between the domestic savings and the required domestic investment. They may also raise the efficiency of the COMESA economies by ensuring that managerial expertise and modern technology are transferred, improving allocation of resources, decreasing the capital raising costs and creating and intensifying competition in the local economy.

1.3 Statement of the Research Problem

Africa has been experiencing fast growth since 2000. Sub-Saharan Africa in particular is the third fastest growing region (5.6% p.a) after emerging markets and developing economies (6.0% p.a) and developing Asia 8.4% p.a (IMF, 2017). Compared to the rest of the world, advanced economies, Latin America and the Caribbean region and Middle East and North Africa region that achieved an average GDP per capita growth rate of 3.9%, 1.9%, 5.2% and 4.8% per annum, respectively, sub-Saharan economy realized higher growth rates between 2000 and 2015 (IMF, 2017).

The need for foreign capital and financial resources in most developing African countries is necessitated by general lack of capital coupled with a low savings rate and low rates of investment. However, the COMESA region has experienced fast growth since 2000 and many COMESA countries are among the fastest growing in Africa\textsuperscript{17}. A number of economies in the region have

\textsuperscript{17} The countries include Djibouti (2.4%), Egypt (2.4%), Ethiopia (6.1%), Libya (2.3%), Mauritius (3.5%), Rwanda (4.7%), Seychelles (2.4%), Sudan (4.1%), Uganda (3.1%) and Zambia (3.6%), among others (IMF, 2017).
abundant natural resources, minerals, oil and gas deposits, strengthened macroeconomic performance, reformed economies and experienced political stability. The region has also attracted high foreign capital and financial resources. However, there is little evidence supporting the link between economic growth, foreign capital and financial resources in the region. Additionally, the effect of absorptive capacity on the growth impact of foreign capital and financial resources is also unclear. Analysis of the nexus of economic growth-foreign capital/financial resources-absorptive capacity provide important information for policy making and academic research.

The evidence in the literature on the relative impact of disaggregated foreign capital and financial resources on the GDP growth in the COMESA region is scanty. This is because, although some empirical studies have been carried out using data drawn from the region, most of them excluded some foreign capital and financial resources from their analysis, as others failed to cover all COMESA countries. The exclusion could be attributed to lack of data on some components of foreign capital and financial resources or some countries. It is also possible that the economies studied were selected based on the level of economic development or even randomly. This is however not clear from the empirical evidence.

Further, empirical evidence shows that disaggregated foreign capital and financial resources have had conflicting impact on the economic growth: positive, negative or even indeterminate. For example, while Amuedo-Dorantes and Pozo (2006), Durham (2004), Islam (1992) found that foreign capital and financial resources have a positive impact on GDP per capita growth rate, Levine and Carkovic (2002), Doucouliagos and Paldma (2009) and Spatafora (2005) established that disaggregated foreign capital and financial resources have no impact on growth. Other authors including Bosworth and Collins (1999), Burnside and Dollar (2000), Chami et al. (2005), Choong

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18 These include DR Congo, Ethiopia, Kenya, Uganda, Zambia and Zimbabwe.

19 All COMESA countries except Egypt and Libya, are peaceful and politically stable.

20 They include Balasubramanyam et al. (1996), Chami et al. (2005), Durham (2003), Gomanee et al. (2002), Macias and Massa (2009), Ndoricimpa (2009), among others.
et al. (2009) and Durham (2003) found that foreign capital and financial resources stifle GDP growth by reducing the rate of savings.

There is also lack of empirical evidence in the literature on the overall impact of aggregated foreign capital and financial resources on the GDP per capita growth in the COMESA region. This is because most of the past regional studies that examine the overall impact of foreign capital and financial resources have been carried out in other regions and excluded African countries. Additionally, few empirical studies that have been carried out using data drawn from the region, including Combes et al. (2017) who aggregated remittances, FDI, official development assistance, portfolio investment and other foreign capital flows including liabilities to foreign banks. The authors however covered only twelve COMESA countries. Other studies include Choong et al. (2009), Durham (2003), Macias and Massa (2009), among others, but they too failed to aggregate foreign capital and financial resources. This is possibly because the researchers were concerned with the relative growth impact of the foreign capital and financial resources.

The aggregation of foreign capital and financial resources is important as it allows for determination of their macro impacts on the GDP growth in the host countries. These capital and financial resources received in the host economies for different purposes have important effects on the overall economic growth. Whereas each of the components of foreign capital and financial resources require its own policy instrument to either regulate or attract it to an economy, synergetic economic policies can be implemented to enhance their total growth impact. This aggregation approach is also supported by Ali (2012), Combes et al. (2017), Lovrinčević, Marić and Mikulić (2005), Mody and Murshid (2005), Mohey-ud-din (2007), Raza (2011) and Yasmin (2005), among others. To the best of our knowledge, there are few studies carried out in the region to particularly determine the growth impact of foreign capital and financial resources taken together although

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21 The studies include Ali (2012), Bordo and Meissner (2007), Lovrinčević et al. (2005), Laureti and Postiglione (2005), and Mody and Murshid (2005), Yasmin (2005), among others.

22 The study covered 77 low- and middle-income countries including 12 COMESA countries, namely, Burundi, Djibouti, Egypt, Kenya, Madagascar, Malawi, Mauritius, Rwanda, Sudan, Swaziland, Uganda and Zambia.

23 One such study was conducted by Combes et al. (2017).
these components are received in the region simultaneously and therefore affect economic growth at the same time. This study seeks to fill this gap.

Although important, there is also a dearth of information on the effect of absorptive capacity in influencing the ability of the region to absorb and benefit from spillovers of the foreign capital and financial resources and promote GDP per capita growth. Empirical evidence shows that while some studies analyze the effect of a single or few absorptive capacity factors, others omit absorptive capacity factors altogether from their analysis and rarely estimate their required threshold for an economy to realize positive economic growth.

Finally, most of the empirical studies do not check for the effects on results of the application of different estimators. This is important as it allows for identification of any differences (or otherwise) in the size of parameters, significance of the variables and validity of any instruments under analysis.

This study seeks to answer the main question: what is the effect of foreign capital and financial resources on GDP per capita growth rate in the COMESA region? It also seeks to answer the following specific questions: (i) what is the overall impact of the aggregated foreign capital and financial resources on the GDP growth and how is it affected by the absorptive capacity in the COMESA region? (ii) what is the relative impact of each of the components of foreign capital and financial resources on GDP per capita growth and how is it affected by the absorptive capacity in the COMESA region? (iii) what is the effect of applying different estimators on regression results? and (iv) what policies can enhance the positive impact of the foreign capital and financial resources on the GDP growth in the COMESA region?

1.4 Objectives of the Study

The main objective of the study is to empirically investigate the effect of foreign capital and financial resources on GDP per capita growth rate in the COMESA region. The specific objectives are to:
a. Determine the overall impact of the aggregated foreign capital and financial resources on real GDP per capita growth rate and examine how this is affected by the absorptive capacity in the COMESA region,

b. Establish the relative impact of each of the components of aggregated foreign capital and financial resources on real GDP per capita growth rate and examine how this is affected by the absorptive capacity in the COMESA region,

c. Explore the effects of applying different estimators on the regression results,

1.5 Contribution of the Study

This study makes contributions to policy and existing literature in several ways. It analyses how absorption capacity may affect growth impact of foreign capital and financial resources in the developing countries of the COMESA region. Although foreign capital and financial resources have been attracted to the African countries by their large domestic markets by population size, strengthened macroeconomic performance, reformed economies, political stability, vast natural resources and incentives, their absorption is more important than the attractiveness because the absorption capacity influences growth. Absorptive capacity also ensures that only quality foreign capital and financial resources are attracted to the COMESA region. COMESA countries that have rich absorptive capacity might benefit more from foreign capital and financial resources. Well-developed human capital, financial sector, infrastructure, more open economies and well-functioning governance institutions that enhance the ability of the region to absorb and benefit from spillovers of foreign capital and financial resources may therefore enhance growth. Additionally, the absorptive capacity should reach a certain threshold for the foreign capital and financial resources to contribute positively to economic growth in the region. While this proposition seems straightforward, no sufficient empirical work has been carried out in the COMESA region to support it. This is a novel contribution of this study.

Another novel contribution of this study is aggregation of foreign capital and financial resources, contrary to previous regional studies that have examined the growth impact of either a single component of these resources or relative impact of each component of aggregated foreign capital and foreign financial resources estimated in a single model. It is argued that foreign capital and
financial resources are received in host countries simultaneously for different purposes that have important effects on the overall economic growth. Aggregation of foreign capital and financial resources therefore allows for determination of overall growth impacts of aggregated foreign capital and financial resources in the host countries. Hence, while it is important to examine their relative growth impact, establishment of the overall growth impact of aggregated foreign capital and financial resources is equally critical.

This study also contributes to methodology by using better measures for variables, particularly human capital, infrastructure and quality of institutions. Human capital can be measured by the cost of labor/wages, size of labor force, years of schooling, enrollment rates in either secondary school or both secondary school and tertiary colleges, amongst others. However, these measures do not represent all dimensions of human capital development. For example, the enrollment rates and the years of schooling exclude health and income per capita dimensions of human capital development. In this study, human capital development variable is measured by the Human Development Index (HDI) supplied by the United Nations Development Programme (UNDP). HDI is a better measure of human capital development as it considers diverse and important dimensions of human capital development such as life expectancy, health, mean of years of schooling, expected years of schooling for children of school entering age and gross national incomes per capita. However, although other better measures of human development have been developed by adjusting HDI for inequalities, disparities between women and men and overlapping deprivations suffered by individuals at the same time, they are not used in this study. This is

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24 These new measures of human development include the inequality-adjusted HDI or (IHDI), gender development index (GDI) and multidimensional poverty index for developing countries (MPI). IHDI combines a country’s average achievements in health, education and income with how those achievements are distributed among country’s population by “discounting” each dimension’s average value according to its level of inequality. The difference between the IHDI and HDI is the human development cost of inequality or the loss to human development due to inequality. The GDI measures gender gaps in human development achievements by accounting for disparities between women and men in three basic dimensions of human development: health, knowledge and living standards. It is a direct measure of gender gap showing the female HDI as a percentage of the male HDI. Finally, the MPI complements monetary measures of poverty by considering overlapping deprivations suffered by individuals at the same time. The index identifies deprivations across the same three dimensions as the HDI and shows the number of people who are multidimensionally poor and the number of weighted deprivations with which poor households typically contend with.
because some countries do not have data for certain types of inequalities. Additionally, data on these new measures of human development is not available.

The infrastructure variable used in this study is measured by the indicators of development of quality overall infrastructure, roads, railroad infrastructure, port infrastructure, air transport infrastructure, electricity supply, available airline seat kilometres and fixed telephone lines and mobile telephone subscriptions. This measure is better as it captures a wide range of aspects of infrastructure compared to variables such as production of electricity, consumption or transmission and distribution losses, and the ratio of paved roads used by researchers such as Ayanwale (2007) and Khan and Bamou (2007); public investment to GDP ratio used by Barro (1990) and Mwega and Ngugi (2007); and telephone densities in host economies and the number of fixed telephone lines used by Bouiyour (2003), among others. Lastly, the quality of institutions variables used in this study are measured by the world governance indicators of voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption. These variables are key determinants of growth and important absorptive capacity factors for aggregated and disaggregated foreign capital and financial resources.

This study employs dynamic GMM-difference analysis that tackles problems of dynamic effects, endogeneity, unobserved heterogeneity and short panel bias that have largely been ignored by the existing literature. Most of the literature makes use of a static linear panel framework with a few exceptions. Use of panel data analysis is also a very valuable resource for ascertaining empirical solutions to policy implications with macroeconomic data.

Finally, the choice of the COMESA, formed in December 1994 to replace a Preferential Trade Area which had been in existence since 1981, is important for a number of reasons. First, this is a region where the countries are operating as a block, representing the largest regional organization in Africa with a population of 492.5 million people, total imports of USD 183 billion, total exports of USD 95 billion and had a GDP (PPP) value of USD 657.4 billion in 2014 (UNCTAD, 2017).

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25 Data for IHDI is available for all COMESA countries but Burundi, Comoros, Eritrea, Libya, Seychelles and Sudan for over the 2011-2015 period, while data for GDI is also available for the rest of the COMESA countries except Djibouti, Eritrea and Seychelles in 2015 only. Finally, data for MPI is not available for Eritrea, Mauritius and Seychelles but available for the rest of the COMESA countries only once in different years.
The common market therefore provides a large market for goods and services produced by the member countries and the rest of the world too. It also constitutes a huge market for investment, with the highest rate of return on investment in the world. The COMESA also provides an important opportunity to develop and implement policies that influence the economic growth of all the countries in the region. This study contributes to economic policy that benefits member countries in particular and the entire region in general. Secondly, the COMESA fosters cooperation in creation of an enabling environment for foreign, cross-border and domestic investment and promotion of research and adaptation of science and technology for development (Mudida, 2003). The COMESA countries are also required to develop capacities to enhance trade activities by developing high quality institutions, infrastructure and human capital, among others. This in turn helps develop their absorptive capabilities and attract greater inflows of foreign capital and financial resources to complement domestic investment and promote economic growth. Thirdly, the findings of this study are useful for comparative purposes with results of previous or future studies conducted in the region or other regions in the world. Lastly, the findings of the study will assist policy makers in the region to come up with economic policies founded on empirical research.

1.6 Scope of the Study

The study investigates the effect of the aggregated and disaggregated foreign capital and financial resources on GDP per capita growth of Burundi, Comoros, Djibouti, Democratic Republic of Congo, Egypt, Eritrea, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Sudan, Swaziland, Uganda, Zambia and Zimbabwe. The study utilizes panel data over the 2000-2015 period. The study covers a period of 16 years running from 2000 to 2015. This period is chosen because data on variables under investigation is not available for most COMESA countries in the prior years.

1.7 Structure of the Thesis

The rest of the thesis is structured into four chapters. Chapter two employs a dynamic panel data model to investigate the impact of aggregated foreign capital and financial resources on the economic growth in the COMESA region. The chapter also determines the effect of absorptive
capacity on the growth impact of aggregated foreign capital and financial resources. The chapter also approximates the threshold of the absorptive capacity required to ensure the COMESA region realizes positive economic growth from the aggregated foreign capital and financial resources. The one-step GMM-difference estimator is used to generate results.

Chapter three examines the relative impact of each of the components of the aggregated foreign capital and financial resources on GDP per capita growth rate in the COMESA region. The chapter also determines the effect of the absorptive capacity on the growth impact of disaggregated foreign capital and financial resources and approximates the threshold of the absorptive capacity required for the region to realize positive growth from the disaggregated foreign capital and financial resources. An autoregressive dynamic GDP growth panel model of order one is specified and estimated using the one-step GMM-difference estimator.

Chapter four employs the same dataset on the same autoregressive dynamic GDP growth panel model of order one to explore the effects of applying various estimators to generate regression results. Pooled ordinary least squares (POLS) and fixed effects (FE) methods are applied to estimate the static GDP per capita growth panel data model while the one-step generalized method of moments (GMM) of the types advanced by Arellano and Bond (1991) and Blundell and Bond (1998) are used to estimate the autoregressive dynamic GDP growth panel model of order one.

Finally, chapter five provides conclusions drawn from the analysis and makes policy suggestions as per the findings of the study.
CHAPTER TWO: IMPACT OF AGGREGATED FOREIGN CAPITAL AND FINANCIAL RESOURCES ON ECONOMIC GROWTH IN THE COMESA REGION

2.0 Introduction

The need for foreign capital and financial resources in the host countries is necessitated by a general lack of capital coupled with low savings rate and low rates of investment. These resources provide important support to the host economies but their reliance is sometimes associated with high level of exposure to global crisis and policies of home countries. The relationship between foreign capital and financial resources and GDP per capita growth is not as straightforward as it appears. Researchers hold varying views regarding growth effects of foreign capital and financial resources, especially in the host countries.

On the one hand, some researchers such as Combes et al. (2017) and Lovrinčević et al. (2005) argued that increase in the inflow of aggregated foreign capital and financial resources leads to a rise in economic growth of the host country by increasing the level and efficiency of investment and via development of the domestic financial sector. Greater access to these resources can also lead to consumption smoothing, improve management of risk between local and international investors and deepen integration with foreign financial markets. Other researchers argue that foreign capital and financial resources boost the savings rate in the host country (Yasmin, 2005), augment scanty foreign exchange reserves in less developed countries to pay import bills and strengthen exchange rate (Gul, Mohammad, Khattk & Amin, 2015) and brings cheap and relatively less risky access to funds in addition to transfer of technology (Ali, 2012). Further, Raza (2011) argued that neoclassical and endogenous growth theories emphasize the role of foreign capital and financial resources as a major promoter of modernization hypothesis and that it can be utilized as a tool to fill the gap in local savings, domestic investment and create a competitive environment.

On the other hand, there are some authors who argue that foreign capital and financial resources have adverse effects on the GDP per capita growth of host countries. For instance, Bordo and Meissner (2007) argued that foreign capital is generally moved with intentions inconsistent with economic fundamentals which lead to economic volatility. Moreover, inefficient allocation of funds may not yield the theoretical outcome (Collier & Dollar, 2002), and increased inflows of
these resources may result in high prices (Ali, 2012). The empirical evidence on foreign capital and financial resources-GDP growth nexus is therefore conflicting.

The aim of this chapter is to determine how the sum of the FDI, short term foreign capital flows, cross-border bank lending, overseas development assistance and official aid and remittances have jointly impacted on the GDP growth in the COMESA region. The composition of the aggregated foreign capital and financial resources flows differs from one empirical study to another. The aggregation of foreign capital and financial resources facilitates the determination of overall macro impact of foreign capital and financial resources on the GDP growth in the host countries. It also informs the formulation and implementation of economic policies that enhance the growth impact of all the said capital and financial resources. However, aggregation of foreign capital and financial resources may not be possible where stock and flow variables are involved. Additionally, each component of foreign capital and financial resources may require specific policies to be effective, as opposed to aggregation of foreign capital and financial resources, where some policies may adversely affect the overall growth impact of the aggregated foreign capital and financial resources. Finally, it is not possible to aggregate all components of foreign capital and financial resources: some components may be excluded due to lack of data. The chapter also determines the effect of the absorptive capacity factors in influencing the ability of the COMESA region to absorb and benefit from spillovers of the aggregated foreign capital and financial resources and increase the growth of GDP. It also determines the approximate threshold of the absorptive capacity factors required for the COMESA region to realize a positive growth impact from the aggregated foreign capital and financial resources.

The chapter examines the following specific research questions: (i) What is the overall impact of the increase in aggregated foreign capital and financial resources on the GDP growth in the COMESA region? (ii) What is the effect of the absorptive capacity factors on the growth impact of total foreign capital and financial resources in the COMESA region? (iii) What is the

26 FDI stock, a stock variable, has been converted into a flow variable by using changes in the data of FDI stocks. This way, it has been possible to add the variable to the rest of the flow variables used in this study.

27 Except portfolio investment, the data for FDI and all components of foreign financial resources is available.
approximate threshold of the absorptive capacity factors required for the COMESA region to realize a positive impact on the GDP growth from the AFCFR?

This study contributes to the existing empirical literature by providing an analysis of the overall impact of aggregated foreign capital and financial resources on the GDP growth in nineteen developing countries in the COMESA region. It applies the dynamic generalized method of moments suggested by Arellano and Bond (1991) to generate regression results. This method produces reliable, efficient and robust estimates.

The rest of this chapter is structured as follows: Section 2.1 presents a review of the existing theoretical and empirical literature on the growth impact of aggregated foreign capital and financial resources in the host countries. An overview of the literature review is presented at the end. Section 2.2 describes the methodology used in the chapter. The section describes the theoretical framework, empirical model specification, variables, data types used in the study and their sources. Section 2.3 describes estimation and analysis of data. Descriptive statistics are discussed in section 2.4 while correlation of the variables are discussed in section 2.5. Section 2.6 is the empirical results and discussions. Section 2.7 is the summary, conclusion and policy implications of this chapter.

2.1 Literature Review

2.1.1 Review of Theoretical Literature

The impact of foreign capital and financial resources on economic growth is analysed in the context of neoclassical and endogenous growth theories. Most past studies on economic growth based on the neoclassical theory utilized the aggregate production function approach28 in their analyses (Ramsey, 1928; Solow, 1956; Solow, 1957; Cass, 1965; Koopmans, 1965). These researchers developed some of the most important models that contributed immensely to the neoclassical theory of economic growth. For instance, Cass (1965), Koopmans (1965) and Ramsey (1928) developed the optimal growth model in uninterrupted time for an economy with independent labour-augmenting technical progress. According to this model, the economy is

28For detailed discussion on the aggregate production function, see Cobb Douglas (1928) and Solow (1956; 1957).
assumed to have a production sector which is perfectly competitive and utilizes a Cobb-Douglas type of aggregate production function given by

\[ Y = F(K; L) = K^{\alpha}(AL)^{1-\alpha} \]  \hspace{1cm} 2.1

to generate output (Y) utilizing labour (L) and capital (K). The supply of labour, equated to the size of population, is assumed to rise independently at a continuous rate

\[ \dot{L}/L = \delta \]  \hspace{1cm} 2.2

and \( \Lambda \) is a labour productivity index that expands at rate

\[ \dot{\Lambda}/\Lambda = \zeta \]  \hspace{1cm} 2.3

According to this model, the technical progress allows each worker to generate more and more output over time with the same amount of physical capital. The quantity given by \( AL \) refers to the number of efficiency units of labour in the economy.

The accumulation of aggregate capital is in accordance to

\[ \dot{K} = Y - C - \delta K \]  \hspace{1cm} 2.4

where C is per-capita consumption.

The authors demonstrated that the per-capita consumption, income and capital all grew at the rate, \( \zeta \). Hence, the axiom of labour augmenting technical progress is made because in steady-state, the consumption per-capita (C), income (Y) and capital (K) in equation 2.4 expand at the same rate. The authors concluded that the steady-state is higher if capital was more productive (that is, \( \alpha \)\textsuperscript{29} is higher), and is lower if consumers are impatient, growth of population is faster, depreciation of capital is greater, or technical progress occurs more rapidly. However, while the model offered an analytical solution for its steady-state, it did not give an analytical solution for the process of transition to the steady-state.

\[ ^{29} \] therefore measure capital productivity.
In turn, Solow (1956:1957) used the neoclassical model to analyse the relationship between the output of an economy and tangible capital and labour inputs. The author used macroeconomic data obtained from the United States of America for the 1909-1949 period to integrate the aggregate production function. According to the author the role of investment in the aggregate production function framework is expressed by two equations, 2.5 and 2.6.

Equation 2.5 is an aggregate production function describing the relationship between output (Y), primary inputs labour (L) and capital (K), and technology (A) which is deemed Hicks-neutral:

\[ Y = A^*f(K,L) \] ………………………………………………………………………………………………………… 2.5

Equation 2.6 or capital accumulation equation describes the relationship between stock of capital (K) and investment in tangible assets (I):

\[ \Delta K_t = I_t - \partial K_{t-1} \] ………………………………………………………………………………………………………… 2.6

where \( \Delta \) is a non-continuous change, \( \partial \) represents depreciation, and \( I_t \) is total investment. The term of total investment can either be endogenously determined by firms that maximize profit or assumed to be a non-variable ratio of output, say \( \alpha Y_t \). Further, the neoclassical growth model assumes existence of perfectly competitive markets for factors of production and constant returns to scale where factor inputs are paid their respective marginal products. When the production function is decomposed it relates growth of output as a weighted form of function of change in labour and capital inputs and the residual given by (\( \Delta \ln A \)):

\[ \Delta \ln Y = \tau_1 \Delta \ln K + \tau_2 \Delta \ln L + \Delta \ln A \] ………………………………………………………………………………………………………… 2.7

where \( \tau_1 \) is share of capital to output, \( \tau_2 \) share of labour to output, and the neoclassical axioms imply \( \tau_1 + \tau_2 = 1 \). The term of technology given by A is assumed to be independent to the growth model. It is shown in equation (2.8):

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\(^{30}\)A technological innovation is said to be Hicks-neutral if the ratio of marginal product of capital to marginal product of labour is constant for a given ratio of capital to labour (see Hicks, 1932 for more details).
\[ A_t = A_0 e^{gt} \]

where \( g \) is the rate of growth of technology, \( A_0 \) and \( A_t \) are technological progress if the economy started off in period 0 and is at period \( t \), respectively.

The neoclassical framework has been extensively used to examine the relationship between accumulation of capital and economic growth. Equations 2.5 and 2.6 depict the direct link between tangible assets investment and economic growth. This model particularly shows that the share of capital accumulation to economic growth is equal to the contribution of capital to the national output. It is clear from the review of the analysis of the foregoing neoclassical models that, neoclassical growth theory is based on the axiom that economic growth is produced via exogenous factors of production functions such as the accumulation of stock of capital and labor force. Further, Barro and Sala-I-Martin (1995) revealed that economic growth is positively related to accumulation of capital over time.

According to the neoclassical theory, a rise in the accumulation of capital will lead to a rise in economic growth assuming that labor and technology remain constant (Barro & Sala-I-Martin, 1995; Chui, Levine, Murshed & Pearlman, 2002; De Jager, 2004). This implies that growth is affected only in the short-run period, influenced by the accumulation of stock of capital, which is in turn determined by the rates of saving and capital depreciation. Alternatively, economic growth is influenced by exogenous factors such as technological progress, which takes the form of augmentation of labor force, in the long-run (Barro & Sala-I-Martin, 1995; Chui, Levine, Murshed & Pearlman, 2002). Consequently, economic growth is dependent on the accumulation of capital stock and the labor force augmentation via technological progress. As a result, if technology introduced by new foreign capital leads to higher productivity of labor and capital stock this will lead further to more consistent investment returns and labor will grow exogenously (Chui, Levine, Murshed & Pearlman, 2002; De Jager, 2004).

In general, the neoclassical theory argues that foreign capital complements the stock of capital in the recipient country, and in turn, promotes economic growth towards a new steady state by this capital accumulation. The neoclassical growth theorists argue that foreign capital affects economic growth in the short-run via diminishing returns to capital; hence foreign capital promotes economic
growth via increasing local investment (Herzer, Klasen & Newak-Lehmann, 2008). The neoclassical growth theory is also called exogenous growth theory (Chui, Levine, Murshed & Pearlman, 2002; Elboiashi, 2011).

Though popular, the neoclassical theory and model has several shortcomings. First, since capital accumulation is subject to diminishing returns, steady per capita income growth cannot be achieved without existence of exogenous technical progress. This is a major shortcoming of the neoclassical theory in that it fails to offer the economic explanation about technological progress and long-run growth. The definition of the capital accumulation term presents other flaws of the neoclassical model. The neoclassical model used by Solow (1956:1957) considers investment in pure tangible assets only. However, the literature has discussed in detail on the definition of capital. For example, Jorgenson (1996) defined investment as the commitment of current resources in the anticipation of returns in the future and can take a variety of forms. Further, the neoclassical theory considers labor as knowledge or human capital. Labor is human capital because accumulation of knowledge occurs within a firm and is stored within the systems of the firms. Additionally, this theory does not offer sufficient explanation of production and the diffusion of technology, knowledge and the information that is a perverse in economic analysis (Ho, Kauffman & Liang, 2007). It does however include a time trend to reflect technological progress in the long-run economic growth rate (Barro and Sala-I-Martin, 1995; De Jager, 2004). A key contribution of the neoclassical growth theory is that it recognized the critical role played by physical capital and labour in influencing economic growth.

The shortcomings of the neoclassical models gave rise to endogenous growth theory, especially the failure to account for technical progress. Whereas the neoclassical growth model reported on a significant impact of technical progress on growth, the endogenous growth theory was faced with the challenge of investigating the determinants and impacts of technical progress. The endogenous growth theory mainly examined the creation of technical knowledge and its transmission in the economy. It particularly emphasized on motives that drive invention, innovation and creation as a main catalyst of economic growth.
A number of studies have been carried out on endogenous growth theory and important growth models developed by authors such as Aghion and Howit (1992), Arrow (1962), Barro (1990), Barro and Sala-i-Martin (1995), Coe and Helpman (1995), Frankel (1962), Grossman and Helpman (1991), Lucas (1988), Romer (1986; 1990), Sheshinski (1967) and Uzawa (1965), among others. The growth models generally assumed constant returns to scale to capital and labour inputs and the level of technology was assumed to be dependent on a set of inputs. The growth models also extended the concept of capital to include human capital in the forms of education, experience and health (Caballe & Santos, 1993; Lucas 1988; Mulligan & Sala-i-Martin, 1993; Rebelo, 1991). These new models therefore recognized the importance of physical capital, human capital and technology as key factors that determine economic growth.

The diminishing returns to accumulation of capital, which is responsible for limiting the growth in the neoclassical models, is usually combined with other important factors such as technological progress and the labor employment to influence the output in the economy. However, the class of models in which one of these other factors that influence output is assumed to increase spontaneously in proportion to the capital, and in which the growth in this other determinant impede the effects of diminishing returns, thus allowing output to grow in proportion to capital, are called proportionate output-capital growth theories. These models are popularly known as AK models, because they generate a production function of the form given by $Y = AK$, where $Y$ is the output, $K$ is capital and $A$ is technology. The technology is assumed to be constant because it takes a long time to change. Consequently, changing the capital stock, $K$, is what gives a different output, $Y$. The AK model is the simplest version of endogenous growth model. The model supposes constant exogenous saving rate and fixed technology level. The stickiest assumption of this model is that the production function is not subject to diminishing returns to capital. This means that the model can result into endogenous growth. The AK model, by Frankel (1962), was the first form of endogenous growth theory. The model did not differentiate between technological progress and accumulation of capital. It effectively put together the human and physical capital whose accumulation is analysed by neoclassical growth theory where the intellectual capital is considered accumulated when innovations take place. Frankel contended that the aggregate production function may depict either a continuous or increasing marginal product of capital. This is because, when firms accumulate more capital, some of that increased capital is the intellectual capital that
brings about technical change, and the technological progress counteracts the diminishing tendency of the marginal product of physical capital.

In the case of exact continuous marginal product of capital, aggregate output, $Y$ is directly proportional to the aggregate capital stock, $K$:

$$Y = AK$$  \hspace{1cm} (2.9)$$

where $A$ is a non-negative constant. The AK model proposes that the long-term growth rate of an economy depends on its saving rate. For simplicity, it is assumed that the savings rate $s$ is exogenously given. For instance, if a fixed proportion $s$ of national output is saved and capital is depreciated at a fixed rate of $\delta$, the accumulation of capital or the aggregate net investment rate over time $t$, is given by:

$$\frac{\partial K}{\partial t} = sY - \delta K = sAK - \delta K$$  \hspace{1cm} (2.10)$$

which considered along with (2.9), means that the rate of growth ($g$), is represented by:

$$= \left( \frac{1}{Y} \right) \left( \frac{\partial Y}{\partial t} \right) = \left( \frac{1}{K} \right) \left( \frac{\partial K}{\partial t} \right) = sA - \delta$$  \hspace{1cm} (2.11)$$

Equation 2.11 demonstrated that the growth rate of output (that is, $\left( \frac{1}{Y} \right) \left( \frac{\partial Y}{\partial t} \right) = sA - \delta$) is equal to the rate of growth of capital (that is, $\left( \frac{1}{K} \right) \left( \frac{\partial K}{\partial t} \right) = sA - \delta$). Thus, a rise in the rate of saving, $s$ results in a permanently higher rate of economic growth. Two key implications can be drawn from the AK theory. First, growth is endogenous since there is no need to revert to an exogenous engine of growth such as exogenous technical change. Second, the rate of growth of the economy is positively dependent on the rate of savings and investment rate. Consequently, any economic policy strategy that raises the rate of savings creates permanent economic growth.

Other endogenous growth theorists include Arrow (1962) who argued that tangible assets investment generate spillovers thereby implying that technology is a direct function of stock of capital. The author used past values of total investment to derive a model of learning-by-doing and posit that inter-temporal learning spillovers or knowledge contribute positively to economic growth. Learning-by-doing is considered external to the firms that produce and to the firms that purchase new capital goods. Thus, the capital and labour inputs could continue earning their
marginal products as no extra compensation would be paid to the technological progress under a perfectly competitive equilibrium. The Arrow (1962) model is written in summarized version as equation 2.12.

\[ Y_i = A(K)*f(K_i, L_i) \]

where \( i \) are factors specific to the firm, labour (\( L_i \)) and capital (\( K_i \)), \( K \) is the aggregate stock of capital, and \( A(K) \) is the function of technical progress.

The Arrow model, however, was inappropriate in cases where the ratio of capital to labour and labour requirements were not both fixed. Consequently, Aghion and Howitt (1992) observed that the growth of output in the long run is limited by the expansion of labour force, and hence is not dependent on savings behaviour, as presented in the Solow-Swan model.

The linkage between investment and technological progress is rationalized by Arrow's presumption of learning by doing and also by recognizing that implementation of new ideas require new quality of capital goods. Sheshniski (1967) extended Arrow’s (1962) models and proceeded to argue that new ideas are unintended by-products of processes of production meaning that discoveries by each worker instantaneously spread to the whole economy since knowledge is non-rival.

Further, Kaldor (1957) set aside the idea of an aggregate production function as well as the difference between productivity growth due to stock of capital and those owing to technical change. Instead, the author introduced a technological progress function that related the output rate of growth to the rate of investment, the position and shape of which depicted the latent rate of generation of new ideas and rate of their adaptability in the society. In Kaldor's model the rate of economic growth in the steady state is not dependent on the behaviour of savings and is determined wholly by the investment rate.

It has been shown by Uzawa (1965) that an endogenous rate of sustained economic growth could be realized in the neoclassical model. The author represented human capital per worker with the technological progress, assumed that growth in human capital required the utilization of services of labour in terms of inputs of education and investigated the optimal paths of growth. Under the
axiom that the utility function was not nonlinear, the author argued that the optimal path of accumulation was one in which investment was specialized either in human or physical capital, until some fixed period of time at which a steady state was reached with equal exponential growth in technical change and capital. Aghion and Howitt (1992) observed that Uzawa's (1965) model was restricted in terms of the description of optimal paths of accumulation and failed to explain how the economy would repay activities that made technology increase in a world of increasing returns.

In the mid-1980s, the neo-classical growth theory became theoretically dissatisfying in explaining the determinants of economic growth in the long run (Barro & Sala-I-Martin, 1995). According to Chui, Levine, Murshed and Pearlman (2002), the endogenous growth theory, unlike the neo-classical theory, emphasized that economic growth is not the result of forces that come from outside but an endogenous outcome of economic system. For this reason, this theory does not invoke exogenous technological change to explain why GDP per capita increase by an order of magnitude. The theory also does not assume that technology is the same across different countries. This theory is developed along increasing quality ladders, varieties of goods and services, and innovation.

On one hand, the principal path of endogenous growth theory of increasing the quality ladders is associated with the work of Lucas (1988) who modelled technological change as a function of the human capital stock. The author, equating technological knowledge to stock of human capital, argued that the average level of human capital contributes to the productivity of all factors of production. In the Lucas (1988) technological progress function, spillovers of the interpersonal human capital, though important characteristic of the model, only add to but do not cause economic growth. They however serve the purpose of illustrating the idea of spillovers that is connected with a network productivity effect. Lucas argued that the addition of human capital per person directly and proportionally influences the productivity of individual persons and determines the productivity of all factors of production put together, because knowledgeable people become even more knowledgeable than they already are by communicating with each other and benefiting from

31 See Lucas (1988) for a detailed discussion on the technological production function.
each other’s expertise and varied experiences. Failure to account for these spillovers in economic decision-making such as decisions on the allocation of time between formation of human capital and final output produced, according to Lucas (1988) model, means that little resources will be invested in formation of human capital stock.

On the other hand, the path of increasing the varieties of goods and services and innovation is associated with Romer (1986), Romer (1990), Aghion and Howit (1992) and Grossman and Helpman (1991). Romer (1986) focused on the dynamic externalities within a perfect competition situation. Using a general structure of production and assuming that inter-temporal utility maximization generate savings, the author specified technical change as a function of the stock of research and development and further assumed that natural externalities are generated by investment in knowledge. In Romer’s (1986) model of technological progress, the generation of new knowledge by any one firm is assumed to create an external positive effects on the production possibilities of other firms since it is not possible to perfectly patent knowledge or keep it secret.

Assuming a production function with externalities, the author paid particular attention to the situation in which the supply of labor per firm was equal to unity and the depreciation rate was zero. Savings were assumed to be influenced by the owner of the representative firm of one-worker, whose dynamic optimization problem was to:

Maximize $\int_0^\infty u(c(t)) e^{-\mu t} dt$ .......................................................... 2.13

Subject to

$\dot{K} = \bar{A}K^\mu - c$ and $K \geq 0$.

taking the path of time of $\bar{A}$ as exogenously given. In equation 2.13, $c(t)$ is the path of time of consumption per individual person; $u(c(t))$ is an instantaneous utility function of consumption exhibiting positive but diminishing marginal utility; $\mu$ is a positive rate of time preference; $A$ is
the growing number of efficiency units\textsuperscript{32} and $\bar{A}$ is improvement in technology; $K$ is stock of capital and $\dot{K}$ is growth of stock of capital over time.

Assuming a continuous intertemporal elasticity of substitution, namely, $u(c) = (c^{1-\varepsilon} - 1)/(1-\varepsilon)$\textsuperscript{33} for some $\varepsilon > 0$ such that $\varepsilon \neq 1$, one gets the Euler condition given by:

$$-\varepsilon \frac{\dot{c}}{c} = \mu - \bar{A} K^{\varepsilon-1}. \hspace{1cm} \text{2.14}$$

The parameter $\varepsilon$ is the inverse of the intertemporal elasticity of substitution. Having rational expectations, individuals correctly anticipate the same level of capital to be chosen at each period by all firms, hence $\bar{A} = AK^\eta$. The above Euler equation can be rewritten as:

$$-\varepsilon \frac{\dot{c}}{c} = \mu - \bar{A} K^{\varepsilon+\eta-1}. \hspace{1cm} \text{2.15}$$

If $\mu + \eta = 1$ or there exists constant social returns to capital, then the economy sustains a strictly positive but finite rate of growth $g$, in which diminishing private returns to capital are offset by the external improvement in technology $\bar{A}$ that accompany them.

Equation 2.15 implies that

$$g = \frac{\theta A - \mu}{\varepsilon} \hspace{1cm} \text{2.16}$$

This means that the higher the propensity to save $\mu$ or the higher the intertemporal elasticity of substitution measured by $1/\varepsilon$ or the less diminishing the private return to capital $K$ (the higher the $\theta$), the higher will be the growth rate $g$ of the steady-state. However, if the technology parameter $A$ is equal to total accumulated capital stock, then $\bar{A} = A(FK)^\eta$ is in equilibrium, with a corresponding growth rate of steady-state equal to:

$$g = (F^{1-\theta} A \theta - \mu)/\varepsilon \hspace{1cm} \text{2.17}$$

\textsuperscript{32}This allows the stock of capital to increase indefinitely without pushing the marginal product below the rate of time preference, because the effect of diminishing returns is counteracted by the constant rise in productivity.

\textsuperscript{33}$u(c) = (c^{1-\varepsilon} - 1)/(1-\varepsilon)$ can be rewritten as $u(c) = \ln(c)$. Also note that as $\varepsilon \to 1$, $u(c) = (c^{1-\varepsilon} - 1)/(1-\varepsilon) \to \ln(c)$.  

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Consequently, the larger the number of firms $F$, the more externalities there will be in creating modern technological knowledge in the economy and therefore the faster the economy will grow. This means that the growth rate will be positively related to the scale of the economy, measured by the number of firms, $F$.

The endogenous growth theory based on innovation posits that intellectual capital is the origin of technical change. It also differentiates intellectual capital from both physical and stock of human capital. The accumulation of both physical and stock of human capital takes place through saving and schooling, respectively. The various forms of the innovation-based growth theories were proposed by Romer (1990), Aghion and Howit (1992) and Grossman and Helpman (1991) who argued that intellectual capital expands via innovation.

Romer (1990) proposed that aggregate productivity is an increasing function of the degree of the variety of a product. According to this theory, innovation leads to growth in productivity by creating new, but not necessarily improved, types of commodities. The theory utilizes the Dixit–Stiglitz–Ethier type of production function, in which final output is generated by labour and a continuum of intermediate commodities as shown in equation 2.18.

$$Y = H^{1-\theta} \int_0^A x(i)^\theta \, di, \quad 0 < \theta < 1 \quad \text{equation 2.18}$$

where $H$ is the aggregate supply of labor, $x(i)$ is the flow input of intermediate product $i$, and $A$ is the measure of different intermediate products that are available for use. Intuitively, a rise in commodity variety, as measured by technical change, leads to growth in productivity by allowing the society to spread its intermediate production more thinly across a wide range of activities, each of which is dependent on the diminishing returns and thus shows a lower average product when operated at a higher intensity.

Aghion and Howitt (1992) and Grossman and Helpman (1991) developed the Schumpeterian theory. This theory focuses on promotion of innovations which improve quality of products and
make old commodities obsolete via the process of creative destruction. In Schumpeterian theory, aggregate output is generated by a continuum of intermediate products shown in equation 2.19.

\[ Y = H^{1-\theta} \int_{0}^{1} A(i)^{1-\theta} x(i)^{\theta} \, di \] ………………………………………………………………………………… 2.19

where there is a fixed measure of variety of a product, normalized to one, and every intermediate product \( i \) has a distinct parameter of productivity \( A(i) \). Each sector is assumed to be monopolized and produces its intermediate product with a continuous marginal cost equal to unity. The monopolist in sector \( i \), faces a demand curve given by the marginal product: \( \theta (A(i)H/x(i))^{1-\theta} \) of that intermediate input in the final sector. Equating marginal revenue (\( \theta \) times this marginal product) to the marginal cost of unity obtains the profit-maximizing intermediate output of the monopolist:

\[ x(i)=\rho HA(i) \] ………………………………………………………………………………… 2.20

where \( \rho = \theta^{2/(1-\theta)} \). Utilizing this to replace for each \( x(i) \) in the function of production in 2.19 generates the aggregate production function given by:

\[ Y=\psi AH \] ………………………………………………………………………………… 2.21

where \( \psi = \rho^\theta \), and \( A \) is the average parameter of productivity given by:

\[ A \equiv \int_{0}^{1} A(i) \, di. \] ………………………………………………………………………………… 2.22

The rate of growth of aggregate output is therefore equal to the average productivity parameter. According to this theory, aggregate output is generated by a continuum of intermediate commodities in the presence of a limited measure of variety of a product. Additionally, it is assumed that each sector of production is a monopoly and produces its intermediate commodity with a constant marginal cost of unity. According to this theory, innovations come up with improved forms of old commodities. This implies that, technology becomes more complex as it advances, making the society to spend more and more on research and development so as to keep innovating at the same rate as in the past. Aghion and Howitt (1998) pointed out that there are

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34See Schumpeter (1942) for more details on the process of creative destruction
adverse rent spillovers as new firms take away the business of old firms, rendering the old forms of commodities and firms obsolete. Therefore the growth rate of an economy depends on the fraction of GDP spent on research and development. For an economy to realize high economic growth rates, it should set aside a large proportion of output to research and development.

Other researchers such as Coe and Helpman (1995) proposed that technical progress is influenced by the stock of research and development held by exotic trading partners. The authors further noted that when a country has unrestricted access to all factors of production available in the economy of the whole world, its productivity growth is determined by the research and development stock in the world. Barro (1990) pointed out that, in order to generate constant returns to scale, capital and government services should complement each other in the process of production. The author added that increasing the stock of capital alone is subject to diminishing returns.

According to the endogenous growth theory, it has been demonstrated that economic growth is derived from the technological changes and human capital stock (De Jager, 2004). The channel of this theory regarding the human capital stock is that labor increases as a share of population. This means that growth is fostered exogenously at a continuous rate. In the later stages, this growth is stimulated by a multiplier of technology that augments labor, meaning that this growth is promoted endogenously via labor augmenting technological progress (De Jager, 2004). However, the main characteristic of endogenous growth theory is the lack of diminishing returns to capital (Ho, Kauffman & Liang, 2007). Therefore, technological progress in terms of the creation of new ideas is a key factor in passing to diminishing returns to capital in the long-run. The theory posits that technological change is boosted endogenously by drawing knowledge from research and development (for instance) and that the development of this knowledge can generate positive externalities and positive growth spillover effects (Barro and Sala-I-Martin, 1995; Ho, Kauffman & Liang, 2007). As a result, research and development, accumulation of human capital and spillovers are considered as key determinants of economic growth in the long run (Meyer, 2003). Effects of spillovers occur as knowledge created by research and development in one economy generates positive effects in other economies (De Mello, 1997).
Endogenous growth theory recognizes economic growth as stimulated in the long-run by the introduction of modern technological processes of production in the host economy, and that domestic investment is presumed to be less productive than the foreign capital, particularly FDI (De Mello, 1999; Herzer, Klasen & Nowak-Lehmann, 2008). Thus, foreign capital is expected to encourage economic growth via spillovers of technological change. These counteract the effects of diminishing capital return by improving the present knowledge stock via labor mobility, skills and training, and via skills of management and organizational arrangements (Barro & Sala-I-Martin, 1995; De Jager, 2004; Romer, 1990). Moreover, foreign capital, particularly FDI, is expected to intensify the existing knowledge stock in the host country via labor training, acquisition of skills and diffusion of technology and also via the introduction of modern practices of management and organizational structures. Overall, the existence of different forms of externality impedes the unrestricted fall of the marginal productivity of capital. As a result, foreign investors boost productivity in the host country making foreign capital a catalyst of domestic investment and technological progress. Also, the most critical channel via which foreign capital promotes economic growth in the host country is expected to be the greatest potential of the externality effect of foreign capital (Borensztein et al., 1998; De Mello, 1997). Thus, economic growth can rise infinitely over time (De Jager, 2004). The endogeneity theory is however unable to predict convergence in growth to allow for the heterogeneity of countries and their dissimilar patterns of economic growth (Ho, Kauffman & Liang, 2007).

The difference between the neoclassical growth theory and the endogenous growth theory is the function of technological progress. The neoclassical growth theory assumes that technical change is exogenous whereas the endogenous growth theory sees technical change as a version spillovers of investment emanating from various origins, including physical capital, human capital stock and research and development expenditures. The neoclassical growth theory does not therefore consider indirect effects in terms of investment spillovers through technological progress; it is however best suited to analyse the direct impact of capital on GDP per capita growth. The endogenous growth theory, on the other hand, is suitable in analysing both direct and indirect impact of investment on GDP per capita as it also recognizes physical and human capital spillovers (indirect effects) through technological progress. However, it requires that the endogenous growth model to be modified to include distinct domestic capital and foreign investment so as to analyse
the investment spillovers and their impact on the economy. Finally, the neoclassical growth theory proposed accumulation of capital whereas the endogenous growth theory defined formation of capital as an important driver of economic growth. The two growth theories did not distinguish between the domestic capital and foreign capital. However, they can be extended to include the said distinction.

The foregoing review of literature has also shown that endogenous growth theory, in particular, identified the determinants of technological progress as the main catalyst of growth. The factors identified include rates of investment and savings (Frankel, 1962; Kaldor, 1957); inter-temporal learning skills and knowledge (Arrow, 1962); new ideas and knowledge (Sheshniski, 1967); human capital per worker (Uzawa, 1965); research and development stock and investment in knowledge (Romer, 1986); stock of human capital and addition of human capital per person (Lucas, 1988); increase in product variety and innovations (Romer, 1990); share of GDP spent on research and development (Aghion & Howit, 1992; Grossman & Helpman, 1991), stock of research and development held by exotic trading partners (Coe & Helpman, 1995) and supply of government services (Barro, 1990), and positive spillover effects of foreign capital and financial resources (Meyer, 2003), among others. The endogenous growth theorists argue that these factors also influence economic growth. The endogenous growth models therefore provided an opportunity to add these factors in production functions as key determinants of economic growth and ability of the countries that receive foreign capital and financial resources to absorb and benefit from spillover effects of the same.

Both the neoclassical and endogenous growth theories analyse labour as an important input, but failed to analyse it and other factors as important in defining the ability of the host economy to absorb and benefit from spillover effects of net foreign capital and financial resources. This study extends the growth theory models and considers labour, represented by human capital development, together with other factors such as trade and capital account openness, competitiveness of infrastructure and quality of institutions as key absorptive capacity factors that influence the ability of the COMESA countries to absorb and benefit from spillover effects of aggregated foreign capital and financial resources and consequently increase their GDP per capita.
2.1.2 Empirical Literature Review

There are many empirical studies on the impact of foreign capital and financial resources on economic growth in host countries. However, the composition of the aggregated foreign capital and financial resources variable varies in every study. Some of the studies on the impact of aggregated foreign capital and financial resources on the growth of GDP per capita of host countries are briefly reviewed next.

To assess the impact of foreign capital inflows and their composition on the real exchange rate and economic growth in developing countries, Combes et al. (2017) employed the GMM for dynamic panel data to deal with the endogeneity bias. Using a large sample of 77 low- and middle-income countries over the period 1980-2012, the results showed that the foreign capital inflows had a direct and indirect effect on economic growth. The authors found that overall, capital and financial resources inflows were associated with higher economic growth after netting out the negative impact of real exchange rate appreciation. The results revealed that doubling inflows of foreign capital and financial resources would increase economic growth by about 50 percent, resulting in a gain of about 2 additional percentage points on top of the 3.7 percent annual growth rate observed within the sample over the period 1980-2012.

Many countries put in place policies to boost the international capital mobility and raise GDP growth rate through improved social welfare in the recipient country. Gourinchas and Olivier (2006) estimated welfare benefits of capital mobility based on calibrated standard neoclassical model. The authors found that welfare benefits are not very large, as predicted by the theories of economic growth, even for the economies with significantly large foreign capital and financial resources inflows. The authors also established that, for a typical non-OECD country, changing from perfect autarky to perfect capital mobility is statistically equivalent to 1% increase in consumption which is relatively negligible as compared to gains from rise in domestic productivity. Foreign capital therefore have a negligible impact on growth.

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35 See the full list of the 77 countries in Combes et al. (2017).
Some empirical studies have analyzed whether or not foreign capital stimulates or displaces domestic investment. One such study is by Bosworth and Collins (1999) who investigated the effect of inflow of foreign capital and components of foreign capital on savings and investment in developing economies of 58 Latin American, East Asian and African countries. The authors concluded that inflows of foreign capital stimulated the growth of domestic investment but also reduced national savings between 1978 and 1995.

A similar study was conducted by Mody and Murshid (2005) who analyzed the link between total foreign capital inflows and local investment in 60 developing countries from 1979 to 1999. Unlike Bosworth and Collins (1999), Mody and Murshid (2005) extended the period of the study from 1995 to 1999. Using portfolio flows and FDI, the authors found that domestic investment is stimulated through inflows of foreign capital. Further, the authors sought to investigate the link between inflows of foreign capital and domestic investment separately for the 1980s and 1990s. They concluded that, over time, the link between foreign capital inflows and domestic investment remained positive but grew weaker: the effect of stimulating local investment via foreign capital inflows in developing economies was relatively bigger in the 1980s than in the 1990s.

Lovrinčević et al. (2005) investigated the impact of foreign capital inflows on the domestic investment by conducting regression analysis on a sample of a panel of 11 transition countries, namely, Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, the Slovak Republic and Slovenia. Using the method of instrumental variables so as to counter the endogenous nature of foreign capital inflows, the authors found a positive link between foreign capital and the level of local investment. Further, among other forms of foreign investment, foreign loans was found to have the largest effect on domestic investment. FDI had a significant positive effect on the domestic investment, while foreign portfolio investment had no significant effect on domestic investment. The authors showed that aggregated capital inflows can directly increase economic growth by raising the rate and efficiency of domestic investment and via the development of the local financial sector. They also showed that access to foreign capital smoothen

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See Mody and Murshid (2005) for the list of the 60 countries.
consumption, improve management of risk between local investors and foreign investors and deepen integration with foreign financial markets.

Ali (2012) analyzed the impact of FDI, remittances, foreign aid and external debt on growth in Pakistan. The author found that total foreign capital had a beneficial effect on GDP growth. In addition, differential effects of disaggregated forms on GDP growth. The author also found that foreign capital may improve social welfare, boost savings and foreign exchange reserves but increase general prices.

Foreign capital flows boost savings and increase economic growth. Using a time series data for Pakistan, Yasmin (2005) examined the growth effect of savings mainly dependent on foreign capital inflows. The author found a direct link between the rate of economic growth and foreign capital. Further, FDI was found to be most important as it had a significant and long-term positive effect on the economic growth of developing countries.

Foreign capital and financial resources inflows are regarded important in providing foreign exchange to finance imports and development projects in recipient economies. Mohey-ud-din (2007) used a two-gap model and a time series data for Pakistan over the 1975-2004 period to analyze the relationship between foreign capital inflows and GDP. Using the aggregate of FDI, ODA and official aid, as total foreign capital, the authors found positive impact of foreign capital inflows on the economic growth. The author also found that FDI, foreign debts, technological aid and tied and untied foreign assistance bridge the gaps between export and import and investment and savings. The two-gap model suggested that poor countries are highly dependent on foreign capital and financial resources because of low foreign exchange reserves. The study also affirmed that Pakistan, a developing country, depend on foreign financial and technical assistance to realize positive GDP growth.

Empirical evidence has also shown that existence of certain conditions have influenced the impact of foreign capital and financial resources on GDP per capita. For instance, Laureti and Postiglione (2005) examined the link between aggregated foreign capital, financial resources and growth of the economies of 11 countries in the Mediterranean using data for the period of 1990-2000. The authors established a positive link between foreign capital, financial resources and economic
growth. This finding was however limited to only those countries which implemented openness-oriented policies so as to attract more foreign capital and financial resources.

Additionally, Gupta, Gupta and Wagh (2007) assessed the impact of remittances on economic growth in sub-Saharan African countries. The authors found that remittances have a direct poverty reducing effect and promote financial development. They also established that financial openness is beneficial to the advanced economies in terms of risk sharing. Further, economies with well-developed domestic financial sector and high quality of institutions avoid macroeconomic volatility and financial crisis and realize growth. On link between financial globalization and economic growth, the authors found that foreign direct inflows and other non-debt generating flows supplement economic growth in host economies and that the growth impact of debt is highly dependent on economic policies and quality of institutions.

Bordo and Meissner (2007) studied the foreign capital-growth nexus for 19 countries during the first era of globalization that ran from 1880 to 1913 and found positive relationship between the two variables. The author used the balance of the current account relative to GDP as a measure of the net inflow and outflow of capital. However, this measure of foreign capital excludes long term foreign capital such as FDI, portfolio equity and debt, among others. Nevertheless, the results were significant in the short-run period and the authors attributed this finding to the fact that most of the capital inflows in the period covered by the study were spent mainly on infrastructure. Investment in infrastructure is associated with rise in the standard of living and may reflect in growth for the time being but long run growth is driven by increase in total factor productivity which is relatively unaffected by such capital inflows.

Prasad, Rajan, and Subramanian (2007) examined the impact of foreign investment on growth of 83 countries for the period 1970 to 2005 by using current account balances as a measure of total external capital financing available to a country. They found that foreign capital is more beneficial for industrialized countries than non-industrialized ones owing to well-developed domestic financial sector. Though inflow of capital is good for non-industrial economies as well but due to

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37The countries examined in the study include Argentina, Australia, Canada, Denmark, France, Germany, Italy, Japan, Norway, Spain, Sweden, United States of America, Austria, Brazil, Chile, India, New Zealand, Portugal and Uruguay.
underdeveloped financial sector, they fail to effectively utilize such inflows to realize economic growth in the long run. This study suggests that poor countries should focus on developing their domestic financial sector even as they seek to attract more foreign capital.

Additionally, Schularick and Steger (2010) compared the first era of globalization (1880-1913) with modern period (1980-2002). Using different model specifications and estimation methodologies, the authors established that from 1880 to 1913, the financial openness and economic growth nexus was significant and robust for all model specifications. On the converse, in contemporary period, the nexus was weakly significant when models controlled for growth of population and openness to trade. The authors reasoned that, unlike historical times, international capital market Openness is no longer associated with net inflows of foreign savings.

Some of the reviewed empirical studies by Gupta et al. (2007), Laureti and Postiglione (2005), Schularick and Steger (2010) and Prasad et al. (2007) emphasizes the importance of absorptive capacity when determining the ability of a host economy to benefit from foreign capital and financial resources. The authors established that foreign capital and financial resources produces positive effects on the growth of GDP per capita only when the absorptive capacity factors of host economies, sectors and firms are sufficient. Some of the important absorptive capacity factors include Openness of the economy, financial Openness, domestic financial sector development and quality of institutions.

2.1.3 Overview of the Literature

The overview of the literature is organized into clusters of research gaps. The analysis of the impact of the aggregated foreign capital and financial resources on the economic growth and the effect of absorptive capacity on the growth impact of the foreign capital and financial resources are both grounded on the neoclassical and new growth theories. The neoclassical and endogenous growth theories recognized physical capital, human capital or labor inputs and technological progress as critical factors that influence economic growth. The relationship between output and the three factors is formalized in the aggregate production function model.

The main feature that differentiates the neoclassical from the endogenous growth theory is the technological progress function. The neoclassical theorists assume technological progress to be
external while the endogenous growth theorists assume technology is a form of investment spillover arising from several sources including physical capital, human capital stock and expenditures on research and development, among others. The two theories did not separate domestic capital from foreign capital and financial resources. However, both theories agree that capital accumulation or formation is important for economic growth.

Most of the empirical studies use modified neoclassical or endogenous growth theory production function models. The modifications range from definition of production function inputs, especially capital and labor. On one hand, physical capital, for instance, can be represented by foreign capital such as FDI, portfolio investment, short-term capital flows and capital transactions, external debt, cross-border bank lending, overseas development assistance (ODA), aid and remittances, among others. In other cases, the physical capital has been represented by domestic investment that can further be disaggregated into private and public investment. In this study, the capital input is represented by domestic investment and aggregated and disaggregated foreign capital and financial resources made up of short-term capital flows and capital transactions, cross-border bank lending, remittances, overseas development assistance and aid. On the other hand, labor or human capital is represented by the cost of labor or wages, size of labor force and education, among others. In this study, human capital development is represented by Human Development Index (HDI) supplied by the United Nations Development Programme (UNDP). Other modifications to the neoclassical and endogenous growth theory models by empiricists include addition of other factors that influence economic growth, including absorptive capacity factors. This study analyzes public debt, inflation and absorptive capacity factors such as trade and capital account openness, financial sector development, development of quality infrastructure and governance institutions.

The empirical literature review has shown that the impact of inflows of aggregated foreign capital and financial resources on the GDP per capita growth of the recipient nations is conflicting: positive, negative or even indeterminate. Moreover, the studies have excluded COMESA countries from their analysis and none has been conducted in the region.
Previous studies that have examined the overall impact of total foreign capital and financial resources on the GDP growth have used various measures of capital such as balances of current and capital accounts, foreign assets and reserves, among others. However, this approach has several challenges. First, use of current account as a measure of foreign capital focuses on short term foreign capital flows only, while use of capital account excludes short term foreign capital flows from the analysis. For instance, Bordo and Meissner (2007) and Prasad et al. (2007) used current account relative to GDP as a measure of foreign capital to measure foreign capital and financial resources in their studies. However, both empirical studies excluded other important long term foreign capital and financial resources such as FDI, portfolio investment and debt from the analysis. Secondly, use of this approach does not facilitate for analysis of the disaggregated components of foreign capital and financial resources.

These shortcomings seem to suggest that aggregation of both short term and long term foreign capital and financial resources is a better representative of foreign capital and financial resources than balances of current or capital accounts, foreign assets and reserves only. Aggregation of foreign capital and financial resources has several benefits. For example, it facilitates the determination of overall macro impact of foreign capital and financial resources on the GDP growth in the host countries. It also informs the formulation and implementation of economic policies that enhance the growth impact of all foreign capital and financial resources. However, the empirical evidence on the growth impact of aggregated foreign capital and financial resources is scanty. This is because there are very few studies that support the aggregation of foreign capital and financial resources and analyze their impact on growth. They include Ali (2012), Combes et al. (2017), Lovrinčević et al. (2005), Mody and Murshid (2005), Mohey-ud-din (2007), Raza (2011) and Yasmin (2005), among others.

The composition of aggregated foreign capital and financial resources varies from one study to another. For instance, Ali (2012) used aggregated FDI, remittances, foreign aid and external debt, while Combes et al. (2017) used aggregated remittances, FDI, overseas development assistance, 

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38 Theoretically, current account balances show the difference between national savings and national investment and thus, indicate the total amount of foreign investment.
portfolio investment and other flows including liabilities to foreign banks. Mohey-ud-din (2007) utilized aggregated FDI, ODA and aid in their analysis. However, Ali (2012) excluded portfolio investment, short term foreign capital flows and cross-border bank lending, while Mohey-ud-din (2007) omitted these as well as remittances from their analysis. This study follows Combes et al. (2017) closely and uses aggregated FDI, short term foreign capital flows, cross-border bank lending, remittances, ODA and aid to determine their overall growth impact in the COMESA region. The data for these variables is readily available. However, unlike Combes et al. (2017), this study excludes portfolio investment owing to lack of data.

Finally, the literature emphasizes on the role of absorptive capacity in enhancing the ability of the host countries to absorb and benefit from the spillovers of aggregated foreign capital and financial resources. The literature reviewed identified trade openness, financial openness, domestic financial sector development and quality of institutions as the key absorptive capacity factors. Moreover, these studies analyzed one or few absorptive capacity factors and none of the studies are carried out using data drawn from the COMESA region. However, this study examines the effect of absorptive capacity on the growth impact of foreign capital and financial resources considered together and establishes the direct impact of absorptive capacity on the GDP growth.

Moreover, the empirical studies reviewed in the literature fail to consider that factors of absorptive capacity may have a threshold for foreign capital and financial resources to have a positive impact on the growth of GDP per capita of the recipient economy. This study determines whether some or all absorptive capacity factors chosen have a threshold for the aggregated foreign capital and financial resources to have favorable impact on GDP growth in the COMESA region.

The absorptive capacity also determines the quality of aggregated foreign capital and financial resources. However, the past studies reviewed in the literature fail to account for the quality of aggregated foreign capital and financial resources. This study also examines the importance of the absorptive capacity or conditions of host countries in enhancing the quality of aggregated foreign capital and financial resources in the COMESA region.

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39 The said quality means the effect a unit of aggregated foreign capital and financial resources has on economic growth.
2.2 Methodology

This section presents the methodology employed in the study. It is divided into four. It begins by presenting a theoretical framework which outlines the theoretical basis of the analytical concepts and models used in the study. Next, the empirical model estimated in the study is specified. The variables used in the study are explained before describing the types and sources of data.

2.2.1 Theoretical Framework

In economic theory, it is acknowledged that increase in the foreign capital and financial resources raises the stock of capital and technological level, and result into better economic performance. To model the theoretical link between foreign capital, financial resources and GDP per capita, we adopt the Cobb-Douglas (C-D) production function, widely used to represent the technological relationship between the physical capital and labour, and the amount of output that can be produced by those inputs.

The C-D function can be generalized for more than two inputs. In reality there are more than two factors of production. It captures non-linear production functions where calculations are made easy by converting the inputs into logarithmic forms with the powers interpreted as shares of respective inputs to the total production. The C-D production function can be used to investigate the nature of long run production function, which can take the form of either increasing or decreasing or constant returns to scale. The function has been utilized in many other situations besides production, such as utility.

However, the idea of a function of aggregate production has been challenged from a theoretical point of view. First, it is difficult to come up with a unit of measuring physical capital used as an input of production in aggregate production functions. The author argued that, because capital goods are a series of heterogeneous commodities or investment goods, each having specific technical features, it is difficult to express the capital goods stock as a homogeneous

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40This depends on the model specification used in the study.

41Felipe and Fisher (2003) summarized and discussed about the two strands of literature that interrogated the idea of function of aggregate production.
physical entity. Robinson (1954) maintained that only their values can be aggregated. Therefore, it is not possible to get any idea of capital as a measurable quantity independent of pieces and distribution.

The second criticism is based on the literature of aggregation which examines the conditions under which neoclassical micro functions of production can be aggregated into a neoclassical function of aggregate production. In extensive research work that began in the mid-1960s, Fisher (1993) concluded that the conditions for successful aggregation of the functions of micro production into a function of aggregate production with neoclassical properties are so strict that no economy can satisfy them.

However, despite these theoretical shortcomings on the notion of an aggregate production function, other researchers such as Cohen and Harcourt (2003) maintained that “these ‘lowbrow’ models remain heuristically important for the intuition they provide, as well as the basis for empirical work that can be tractable, fruitful and policy-relevant” (p. 209). This explains why the Cobb-Douglas function of production remains the most ubiquitous form in theoretical and empirical analyses of productivity and growth. The estimation of the parameters of functions of aggregate production has been at the centre of much work on growth, productivity, labour and technological change. Empirical estimates of functions of aggregate production are an essential tool of macroeconomic analysis, and key theoretical constructs, such as potential output, the demand for labour, or technical change, are founded on them.

In order to investigate the impact of aggregated foreign capital and financial resources on the GDP per capita growth in the COMESA countries, the theoretical growth model is constructed as 2.23:

\[ Y_{i,t} = A_{i,t} L_{i,t}^\alpha K_{D,i,t}^\beta K_{F,i,t}^\theta \]  

where \( Y \) represents the flow of output, \( A \) is the total factor productivity (explains the contribution of factors that are not included in the model to the output growth), \( K_D \) is the domestic capital, \( K_F \) is the aggregated foreign capital and financial resources, \( L \) is the labor force, \( \alpha \) represents the output changes to labor force changes, \( \beta \) represents the output changes to domestic capital or local investment changes, while \( \theta \) represents the changes in output to changes in foreign capital and financial resources stock. \( \alpha, \beta \) and \( \theta \) are assumed to be less than one, implying 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.

In this study, the estimated parameter on both labour and domestic capital inputs are neither limited to sum to unity nor equal to shares of these inputs because growth rate elasticities of the dynamic production function will only equal their factor shares if markets of factors are perfectly competitive (Coe & Moghadam, 1993). This axiom is unsustainable for our analysis which includes only developing economies with no perfect markets for factors of production.

Several studies such as those by Borensztein et al. (1998) and De Mello (1997) have established that the existence of foreign capital and financial resources may not necessarily produce positive spillover effects, especially if a host country has less ability to absorb the benefits from the said foreign capital and financial resources. These authors suggested that high stock of human capital, investment and other core infrastructures are critical in the technological transfer process.

The natural logarithm of equation 2.23 is taken to derive a standard growth accounting equation and give the following dynamic function of production:

\[
\ln Y_{i,t} = \tau + \alpha \ln L_{i,t} + \beta \ln K_{D,i,t} + \theta \ln K_{F,i,t} + \varepsilon_{i,t} \]

Other factors that explain economic growth, \( W \), are added into equation 2.24. After taking into account the factor endowment of the recipient country and other factors that determine GDP growth, and rewriting we express the general formulation of equation 2.24 as equation 2.25:

\[
\ln Y_{i,t} = \tau + \alpha \ln L_{i,t} + \beta \ln K_{D,i,t} + \theta \ln K_{F,i,t} + \gamma \ln W_{i,t} + \varepsilon_{i,t} \]

where \( \ln \) symbolises the natural logarithm, \( Y \) represents the real per capita GDP; \( L \) represents the labour force; \( K_D \) is the local investment and \( K_F \) represents aggregated foreign capital and financial resources, and \( W \) is a set of other factors that explain GDP per capita growth such as openness of the economy, public debt and inflation; \( \varepsilon \) is a normally distributed error term, \( \tau \) is the constant term and \( \alpha, \beta, \theta \) and \( \gamma \) are the parameters to be estimated.

The same variables are observed every year to make the equation a panel one. We however anticipate that reverse causality may exist when studying the effect of foreign capital and financial
resources on the GDP per capita in the host economies. For instance, growth in the GDP per capita may attract more foreign capital and financial resources such as FDI, and the increased FDI may in turn complement domestic investment and thereby result in increased GDP per capita growth. At the same time, past values of GDP per capita growth rate are likely to influence future GDP per capita growth rates. This means that causality and dynamics are important to the analysis of our hypothesised impact of aggregated foreign capital and financial resources on the GDP per capita growth in the COMESA region.

The incorporation of dynamics into the model requires that equation 2.25 be rewritten as an autoregressive model of order one or AR(1) by including the past values of GDP growth as an independent variable and retaining the rest of the regressors. This operation produces equation 2.26:

\[ \ln Y_{i,t} - \ln Y_{i,t-1} = \tau + \delta \ln Y_{i,t-1} + a \ln L_{i,t} + b \ln K_{Di,t} + \theta \ln K_{Fi,t} + \gamma \ln W_{i,t} + e_t + \upsilon_i + u_{i,t} \]  \hspace{1cm} 2.26

where \( \ln \) is the natural logarithm, \( Y_{i,t} \) represent the real per capita GDP, \( Y_{i,t} - Y_{i,t-1} \) represent the rate of income per capita growth, \( \tau \) is the constant, \( \delta \) is the parameter for the past values of GDP per capita; \( \upsilon_i \) captures unobserved country-specific effect; \( e_t \) are period-specific effect intercept terms meant to capture changes common to all countries; and \( u_{i,t} \) is a white noise error term and the subscripts \( i \) and \( t \) are country and time period, respectively. The rest of the terms are as explained in equation 2.25.

Equivalently, equation 2.26 can be written as equation 2.27 or equation 2.28.

\[ \ln Y_{i,t} = \tau + (\delta + 1) \ln Y_{i,t-1} + a \ln L_{i,t} + b \ln K_{Di,t} + \theta \ln K_{Fi,t} + \gamma \ln W_{i,t} + e_t + \upsilon_i + u_{i,t} \]  \hspace{1cm} 2.27

or \[ \ln Y_{i,t} = \tau + \delta_0 \ln Y_{i,t-1} + a \ln L_{i,t} + b \ln K_{Di,t} + \theta \ln K_{Fi,t} + \gamma \ln W_{i,t} + e_t + \upsilon_i + u_{i,t} \]  \hspace{1cm} 2.28

where \( (\delta + 1) \) is replaced by \( \delta_0 \).

The spillovers impact of aggregated foreign capital and financial resources are dependent on the ability of the host countries to absorb these flows and promote GDP per capita. Literature has shown that high level of human capital, highly developed financial sector, high level of technology, improved trade openness and export-oriented trade policy, capital account liberalization,
development of quality infrastructure and improved quality of institutions enhance the capacity of host countries to benefit from aggregated foreign capital and financial resources in growing their GDP per capita (Gupta et al. 2007; Laureti & Postiglione, 2005; Prasad et al., 2007). The converse also hold true.

To account for the role of absorptive capacity factors in influencing the impact of foreign capital and financial resources on the growth of GDP per capita in the COMESA region, equation 2.28 is rewritten as equation 2.29 and extended to include factors of absorptive capacity, denoted by Z.

\[
\ln Y_{i,t} = \tau + \delta_0 \ln Y_{i,t-1} + \alpha \ln L_{i,t} + \beta \ln K_{D,t} + \theta \ln K_{F,i,t} + \gamma \ln W_{i,t} + \lambda \ln Z_{i,t} + e_t + \upsilon_i + u_{i,t} \quad \cdots \cdots \cdots \quad 2.29
\]

where \( \ln \) represents the natural logarithm, \( Y \) represents the real per capita GDP; \( L \) represents the labour force; \( K_D \) is the domestic investment and \( K_F \) represent aggregated foreign capital and financial resources, and \( W \) is a set of other factors that explain economic growth such as trade openness, capital account openness, public debt and inflation; \( \tau \) is a constant, \( e_t \) time-specific effects which are assumed to be independently and identically distributed over all time periods; \( \upsilon_i \) is an unobserved country-specific effects which are also assumed to be independently and identically distributed over all the countries, \( u_{i,t} \) is a normally distributed error term, \( \delta_0 \) is the parameter for the natural log of the difference of lagged values of GDP per capita; and \( \alpha, \beta, \theta, \gamma \) and \( \lambda \) are the parameters to be estimated.

In order to investigate the extent to which absorptive capacity affects the growth impact from aggregated foreign capital and financial resources in the COMESA region, we follow Choong et
al. (2009), Catrinescu et al. (2009), Durham (2003) and Elboiashi (2011) and include the interaction terms between the factors of absorptive capacity and the aggregated foreign capital and financial resources into equation 2.29 to obtain an autoregressive dynamic panel data model of order one (AR(1)) specified as equation 2.30 below:

$$lnY_{i,t} = \tau + \delta_0lnY_{i,t-1} + a\ln L_{i,t} + b\ln K_{Di,t} + \theta\ln K_{Fi,t} + \gamma\ln W_{i,t} + \lambda\ln Z_{i,t} + \pi(Z*K_f)_{i,t} + \epsilon_t + \upsilon_i + u_{i,t} .$$ 2.30

where ($Z*K_f$) is the interaction terms between the various factors of absorptive capacity and aggregated foreign capital and financial resources. A test of the significance of the interacted coefficient is carried out so as to ensure that the interaction term does not proxy for aggregated foreign capital and financial resources or any factor of the absorptive capacity of host countries when adding the absorptive capacity variables in the regression equations of the form in 2.29.

Following standard theory, it is expected that $\alpha$, $\beta$, $\gamma$, $\lambda$ and $\pi$ are either negative or positive, subject to the impact of the variables on economic growth. If $\theta$ is positive and $\pi$ is negative, the suitable threshold would be the value of the absorptive capacity measure ($Z$) that makes the impact of aggregated foreign capital and financial resources on economic growth positive. In this case, the precise threshold or break-even point (BEP) is given by 2.31:

---

42Choong et al. (2009) investigated how FDI, foreign debt (DEBT) and portfolio investment (PI) impacted on the growth in host 32 developing and 19 developed countries through the stock markets channel via which flows of foreign capital could foster growth. The authors tested the hypothesis that measures of stock market affect the impact of flows of private capital on growth by interacting different components of flows of private capital with two types of stock market measures: market capitalization of the companies listed in the stock and securities exchanges to GDP ratio and the total value of stock traded to the GDP ratio. The study tested the significance of the interacted coefficient.

43Catrinescu et al. (2009) analysed the effect of remittances on growth through institutions of a country as an important channel. The authors tested the hypothesis that institutions affect the impact of remittances received from abroad on economic growth by interacting remittances variable with different indexes of institutional quality such as TI corruption index and ICRG indicators of bureaucracy quality, corruption, ethnic tensions, law and order, democratic stability, government stability, socio-economic conditions, investment profile and political risk. The study tested the significance of the interacted coefficient.

44Durham (2003) interacted bank credit to GDP, stock-market capitalization to GDP, property rights index, business regulation, corruption index, country credit risk with the bond foreign portfolio investment, foreign portfolio investment and other foreign investment in examining their effects on growth on 88 countries from 1977 through 2000.

45Elboiashi (2011) interacted the human capital, technology gap (measured by the ratio of the gap between US GDP per capita and as the world’s technological leader country and host country GDP per capita, relative to host country GDP per capita at constant US dollars), 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.

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56
On the other hand, if both $\theta$ and $\pi$ are positive (negative), then aggregated foreign capital and financial resources inflows has an obvious positive (negative) real effect. The concept of break-even point is important as it determines the threshold of absorptive capacity factors required to ensure that foreign capital has a positive impact on the per capita GDP in the host economies, in this case, the COMESA region.

### 2.2.2 Design of the Model

In the spirit of the foregoing theoretical framework and following Barro (1991), Borenzstein et al. (1996), Levine and Renelt (1992) an autoregressive dynamic panel GDP per capita growth data model of order one (AR(1)), is specified to analyse the overall impact of the aggregated foreign capital and financial resources on the GDP per capita growth in the COMESA region.

Economic growth is determined by human capital, domestic investment, aggregated foreign capital and financial resources, among other macroeconomic, political and institutional factors. Following Barro (1991), Mankiw, Romer and Weil (1992) and Levine and Renelt (1992), initial GDP per capita\(^ {46}\) variable and following M’Amanja and Morrissey (2005) and Petrakos et al. (2007), trade or capital account openness, public debt and inflation variables are also included in the estimation model because they have been found to be very important in explaining economic growth. It is acknowledged that the determinants of growth are either predetermined, or endogenous or both, and current GDP growth could be influenced by past values.

The empirical autoregressive dynamic panel data GDP growth model of order one (AR(1)), estimated in this study is specified as equation 2.32:

$$\ln GDPPC_{i,t} = \tau + \gamma_0 \ln GDPPC_{i,0} + \gamma_1 \ln GDPPC_{i,t-1} + \gamma_2 \ln HUMCAP_{i,t} + \gamma_3 \ln DINV_{i,t} + \gamma_4 \ln OPEN_{i,t} + \gamma_5 \ln PUBDEBT_{i,t} + \gamma_6 \ln INFLA_{i,t} + \gamma_7 \ln AFCFR_{i,t} + \gamma_8 \ln Abscap_{i,t} + \gamma_9 (AFCFR \times Abscap)_{i,t} + e_t + u_i + u_{it} \text{ ...................................................................................................................... 2.32}$$

\(^{46}\) The initial GDP per capita variable is included to ascertain absolute or conditional convergence.
where $\ln GDPPC_{i,t}$ is the natural logarithm of GDP per capita in country $i$ during period $t$; $\ln GDPPC_{i,t-1}$ is the natural logarithm of the lagged GDP per capita, $\ln GDPPC_{i,0}$ is the natural logarithm of the initial GDP per capita, $HUMCAP$ is the human capital stock (measured by the Human Development Index, HDI); $\ln DINV$ is the natural logarithm of the domestic investment (measured by the share of gross fixed capital formation less changes in FDI stocks expressed as a ratio to GDP); $\ln OPEN$ is natural logarithm of the openness of the economy (measured by the share of total imports and exports to GDP or TOPEN and capital account openness or KAOPEN); $\ln PUBDEBT$ is the public debt (measured by the share of the gross debt liabilities to GDP ratio); $INFLA$ is the changes in annual general level of prices represented by consumer price index (CPI), $\ln AFCFR$ represents the natural logarithm of the aggregated foreign capital and financial resources inflows expressed as a ratio of GDP, $\ln Abscap$ are the set of chosen absorptive capacity factors; $\ln AFCFR*Abscap$ are the interaction terms between the factors of absorptive capacity and aggregated foreign capital and financial resources; $\gamma_0$ is a parameter reflecting the speed of convergence of GDP per capita growth rate from one period to the next, $\tau$ is a constant, $\upsilon_i$ is an unobserved country-specific effects which are independently and identically distributed over the countries in COMESA region, $\epsilon_t$ time-specific effects which are also assumed to be independently and identically distributed over all time periods, $\epsilon_{it}$ the error term which is assumed to be independently and identically distributed over all time periods in country $i$; and $\gamma_1$, $\gamma_2$, $\gamma_3$, $\gamma_4$, $\gamma_5$, $\gamma_6$, $\gamma_7$, $\gamma_8$ and $\gamma_9$ are the parameters to be estimated. A positive (negative) sign of the parameters suggests that an increase in the respective variable by one percent leads to a rise (fall) of GDP per capita.

47 The absorptive capacity factors expressed in indices are however not logarized.

48 The absorptive capacity factors that influence the ability of the COMESA region to absorb and benefit from spillovers of the foreign capital include human capital development (measured by the Human Development Index, HDI), openness of the economy (measured by the total imports and exports to GDP and Chinn-Ito indices), infrastructure development (measured by the indicator of quality of overall infrastructure, roads, railroads, ports, air transport and availability of airline seat kilometres, electricity supply, fixed telephone lines and mobile telephone subscriptions), technology gap (measured by the ratio of the gap between US GDP per capita as the world’s technological leader country and host country GDP per capita, relative to host country GDP per capita at constant US dollars), financial sector development (measured by the share of bank credit to GDP) and quality of institutions measured by the the score on the aggregate world governance indicators of voice and accountability, political stability, government effectiveness, regulation, rule of law and control of corruption. In addition to being key absorptive capacity factors, the human capital development and openness of the economy are also key determinants of growth.

49 The $\upsilon_i$ represents diversity in countries including differences in geographical locations, level of economic growth and membership to different economic/trading blocks, among others. The $\epsilon_t$ represents the factors that change over time. All these diversities are accounted for by the GMM estimator.
capita by the percentage size of the coefficient. In model equation 2.32, the coefficient(s) $\gamma_9$ is interpreted as the marginal rise in the impact of aggregated foreign capital and financial resources on the real GDP per capita when the concerned absorptive capacity factor improves. The vice-versa also holds true.

The threshold of the absorptive capacity of the COMESA countries is computed by finding the partial impact of aggregated foreign capital and financial resources (or $AFCFR$) on GDP per capita ($GDPPC_{i,t}$) as:

$\left(\frac{\partial Y}{\partial AFCFR}\right) = \gamma_7 + \gamma_9$, $Abscap = 0$, then the threshold or break-even-point of COMESA countries’ absorptive capacity is given by:

$\left(\text{BEP}\right) = -\gamma_7/\gamma_9$ ................................................................. 2.33.

### 2.2.3 Variables Used in the Study

The choice of the variables in the GDP growth model equation 2.32 is made in line with the literature and based on availability of data and concern about degrees of freedom. Table 2.1 describes the variables estimated in the GDP per capita model. Columns one, two, three and four of this table represent the description of the variables, notation, the expected sign of the estimated parameters and explanation for the expected results, respectively.
**Table 2.1: Summary of Variables and the Expected Signs of the Parameters**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Notation</th>
<th>Expected sign of parameters</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial GDP per capita.</td>
<td>GDPPC(_{t,0})</td>
<td>(\gamma_0 &lt; 0)</td>
<td>The lower the starting level of real GDP per capita the higher the predicted growth rate (Barro, 1991; Levine &amp; Renelt, 1992). Growth is expected to be rapid at first then slows down as the economy becomes more developed.</td>
</tr>
<tr>
<td>Lagged GDP per capita.</td>
<td>GDPPC(_{t,1})</td>
<td>(\gamma_1 &gt; 0)</td>
<td>High values of real GDP per capita in the past are expected to positively influence growth rate of the current real GDP per capita.</td>
</tr>
<tr>
<td>Human capital development</td>
<td>HUMCAP</td>
<td>(\gamma_2 &gt; 0)</td>
<td>Higher level of human capital development promotes economic growth.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(\gamma_8 &gt; 0)</td>
<td>High level of human capital development enhances the ability of the host nation to absorb and benefit from foreign capital and financial resources (Borensztein et al., 1998). It is also expected to enhance the effectiveness of AFCFR in stimulating economic growth (Elboiashi, 2011).</td>
</tr>
<tr>
<td>Domestic investment</td>
<td>DINV</td>
<td>(\gamma_3 &gt; 0)</td>
<td>Increased rate of domestic investment promotes productivity in a country (Elboiashi, 2011; Grossman &amp; Helpman, 1991; Romer, 1986; Solow, 1956: 1957).</td>
</tr>
<tr>
<td>Trade openness</td>
<td>TOPEN</td>
<td>(\gamma_4 &gt; 0)</td>
<td>Trade openness is expected to enlarge markets and expand domestic investment to meet heightened demand for services and goods (Balassa, 1978; Feder, 1982). Trade openness is positively correlated to growth (Balasubramanyam, 1996; Makki &amp; Somwaru, 2004; Yanikkaya, 2003).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(\gamma_8 &gt; 0)</td>
<td>Trade openness and adoption of trade liberalization by host countries are expected to increase the significance of the impact of foreign capital and financial resources on the economic growth rate (Laureti &amp; Postiglione, 2005).</td>
</tr>
<tr>
<td>Capital account openness</td>
<td>KAOPEN</td>
<td>(\gamma_4 &gt; 0) or (\gamma_4 &lt; 0)</td>
<td>A high degree of capital account liberalization is expected to increase the inflow of foreign capital and financial resources, supplement domestic savings and finance domestic investment. Alternatively, the increased inflow of the foreign capital and financial resources may lead to appreciation of exchange rate and inflation in recipient economies.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(\gamma_8 &gt; 0)</td>
<td>A high degree of capital account liberalization is expected to increase the significance of the impact of foreign capital and financial resources on the economic growth.</td>
</tr>
<tr>
<td>Public debt</td>
<td>PUBDEBT</td>
<td>$\gamma_5 &lt; 0$</td>
<td>High level of debt liabilities in the form of Special Drawing Rights, debt securities, currency and deposits, pensions and standardized guarantee schemes, loans, insurance and other accounts payable, represents the risk for a country to face challenges in repaying its national debt and to encounter a financial crisis. The existence of a large public debt can also negatively affect investment by decreasing the funds available to invest, given that the return from new investment will be excessively taxed to allow the government to repay the debt (Cohen, 1994).</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Inflation</td>
<td>INFLA</td>
<td>$\gamma_6 &lt; 0$</td>
<td>High, rising and unstable general levels of prices reduces real future profits and cause uncertainties to investors. Macroeconomic instability provides a less reliable economic environment, which denies the investors benefits from the existing profit opportunities (Larrain &amp; Vergara, 1993; Servén &amp; Solimano, 1993). A growing rate of inflation could further lead to economic distortions and increase input costs, implying an adverse effect on expected output growth (Elboiashi, 2011).</td>
</tr>
<tr>
<td>Aggregated foreign capital and financial resources</td>
<td>AFCFR*</td>
<td>$\gamma_7 &gt; 0$ or $\gamma_7 &lt; 0$</td>
<td>Increased aggregated foreign capital and financial resources is expected to promote GDP growth. However, where some or most of the components of foreign capital exert a negative impact on GDP per capita, rise in aggregated foreign capital and financial resources may affect GDP per capita negatively.</td>
</tr>
<tr>
<td>Financial sector development</td>
<td>FSD</td>
<td>$\gamma_8 &gt; 0$</td>
<td>Increased access to bank credit enhances the growth impact of aggregated foreign capital and financial resources on the diffusion of technology in the host countries. It also boosts savings mobilization and promote growth (Gupta et al., 2007; Shahbaz et al., 2011).</td>
</tr>
<tr>
<td>Voice and Accountability</td>
<td>VOA</td>
<td>$\gamma_8 &gt; 0$</td>
<td>A positive and robust relation is expected between voice and accountability and growth and improvement in the former is expected to have a positive effect on the growth impact of AFCFR in the host economy (Kaufman et al., 1999).</td>
</tr>
<tr>
<td>Political Stability</td>
<td>POSTAB</td>
<td>$\gamma_8 &gt; 0$</td>
<td>A positive and robust relation is expected between political stability and GDP growth and political stability is expected to have a positive effect on the growth impact of aggregated foreign capital and financial resources in the host economy (Kaufman et al., 1999).</td>
</tr>
<tr>
<td>Government Effectiveness</td>
<td>GOVEF</td>
<td>$\gamma_8 &gt; 0$</td>
<td>A positive and robust relation is expected between effectiveness of the government and economic growth and competent and quality delivery of public and civil service is expected to have a positive effect on the growth impact of AFCFR in the host economy (Kaufman et al., 1999).</td>
</tr>
<tr>
<td>Regulatory Quality</td>
<td>REGQUA</td>
<td>$\gamma_8 &gt; 0$</td>
<td>Regulatory quality encourage investment, positively affect the growth impact of AFCFR and promote growth in the host economy (Catrinescu et al., 2009; Kaufman et al., 1999).</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------</td>
<td>---------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Rule of Law</td>
<td>RULAW</td>
<td>$\gamma_8 &gt; 0$</td>
<td>Quality rule of law encourage investment and promote growth (Catrinescu et al., 2009). It also enhances protection of property and contract rights of foreign investors and have a positive effect on the growth impact of aggregated foreign capital and financial resources in the host economy (Gupta et al., 2007).</td>
</tr>
<tr>
<td>Control of Corruption</td>
<td>COC</td>
<td>$\gamma_8 &gt; 0$</td>
<td>Low corruption levels leads to low business costs, encourage investment, have a positive effect on the growth impact of aggregated foreign capital and financial resources in the host economy and also promote economic growth (Catrinescu et al., 2009; Durham, 2003).</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>INFR</td>
<td>$\gamma_8 &gt; 0$</td>
<td>Development of a high quality overall infrastructure, railroads, roads, ports, air transport and availability of airline seat kilometres, electricity supply, fixed telephone lines and mobile telephone subscriptions all reduce cost of doing business, improve private investment returns, attract more foreign investment and promote productivity and economic growth (Aschauer, 1989; Barro, 1990; Greene &amp; Villanueva, 1991; World Economic Forum, 2017).</td>
</tr>
<tr>
<td>Technology gap</td>
<td>TG</td>
<td>$\gamma_8 &lt; 0$</td>
<td>Large technology gap between the host and home country slows down growth, reduces the direct impact and technological and knowledge spillovers of foreign capital and financial resources (Colen, Maertens &amp; Swinnen, 2008; Elboiashi, 2011; Sjoholm, 1999; UNCTAD, 2006). The vice versa also holds true.</td>
</tr>
</tbody>
</table>

Note: $\gamma_i$ are parameters of the GDP per capita model specification, where $i=1,...,8$.

**Source:** Author's Compilation

### 2.2.4 Interaction Variables

The impact of foreign capital and financial resources may depend on the human capital development. Human capital and education allow for absorption and adaptation of foreign capital and financial resources and achieve better economic performance. The benefits of these resources are transferred via training, learning by doing and accumulation of work experience. Thus, human capital is interacted with AFCFR.

Openness of trade has a positive effect on the growth impact of aggregated foreign capital and financial resources. Trade openness and export-oriented policies attract more AFCFR and enhance
the ability of the host economy to absorb and benefit from spillovers of aggregated foreign capital and financial resources (Laureti & Postiglione, 2005). Trade openness variable is thus interacted with the AFCFR.

Capital account liberalization has a positive effect on economic growth. It allows for inflow of greater volumes of AFCFR. The variable is therefore interacted with the AFCFR.

The growth impact of AFCFR is expected to be positively related to a well-developed financial sector (Gupta et al., 2007; Prasad et al., 2007). It is expected that improved access to credit to private sector attracts more AFCFR and enhance the ability of the host country to absorb and benefit from spillovers of aggregated foreign capital and financial resources. The financial sector development variable is therefore interacted with AFCFR.

The impact of AFCFR is positively influenced by quality infrastructure. Competitive infrastructure reduces the cost of doing business, improves private investment returns and enhance the ability of the host countries to absorb and benefit from spillovers of AFCFR (Aschauer, 1989; Barro, 1990; Greene & Villanueva, 1991). Consequently, the infrastructure variable is interacted with the aggregated foreign capital and financial resources variable.

A large technology gap between the host and home country reduces the direct impact and technological and knowledge spillovers of aggregated foreign capital and financial resources (Colen, Maertens & Swinnen, 2008; Elboiashi, 2011). Hence, technology gap variable is interacted with AFCFR variable.

The extent to which a country's citizens enjoy freedom of expression and association, free media and are able to participate in selecting their government, affect the growth impact of AFCFR. The improvement in the voice and accountability variable is expected to encourage more investment, attract more aggregated foreign capital and financial resources and have a positive effect on the impact of AFCFR in the host economy. Hence, voice and accountability is interacted with AFCFR.

Peace and political stability are important for the impact of AFCFR on the GDP per capita growth. A high likelihood of political instability, violence or terrorism may deter investment, discourage free flow of AFCFR and have an adverse effect on the growth impact of foreign capital and
financial resources in the host economy. The political stability variable is therefore interacted with AFCFR.

The quality of public services, civil service and the degree of its independence from political pressures, formulation and implementation of policies and the credibility of the government's commitment to such policies, are important for growth impact of AFCFR. Competent and quality delivery of public and civil service is expected to have a positive effect on the impact of foreign capital and financial resources in the host economy. Hence, the AFCFR variable is interacted with the government effectiveness variable.

The ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development boosts investment, attracts more foreign capital and financial resources and thereby promotes growth. Regulatory quality has a positive direct effect on the growth impact of AFCFR. The regulatory quality variable is therefore interacted with AFCFR.

Growth and ability of the host economy to absorb and benefit from the spillovers of foreign capital and financial resources may depend on the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, and the likelihood of crime and violence. The rule of law encourages investment and attracts more aggregated foreign capital and financial resources to the host economy. Consequently, the rule of law variable is interacted with aggregated foreign capital and financial resources.

Finally, the extent to which public power is exercised for private gain, including all forms of corruption, and capture of the state by elites and private interests, influence growth and the ability of a host country to absorb and benefit from the spillovers of AFCFR. Prevalence of corruption and graft increase operational costs, deters growth and has adverse effects on the growth impact of the foreign capital and financial resources. The control of corruption variable is therefore interacted with AFCFR variable.
2.2.5 Data Types and Sources

This study uses annual data over the 2000-2015 period. The period was selected owing to lack of data for some years prior to 2000 for some variables including human capital development and institutional factors. The sample contains 304 observations corresponding to nineteen countries found in the COMESA region. The selection of countries and period of study and countries is determined exclusively by data availability and membership to the COMESA region, respectively. The countries selected are Burundi, Comoros, Djibouti, Democratic Republic of Congo (or DR Congo), Egypt, Eritrea, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Sudan\textsuperscript{50}, Swaziland, Uganda, Zambia and Zimbabwe. The variables analysed include real GDP per capita, foreign direct investment, short term foreign capital flows, cross-border bank lending, overseas development assistance and official aid, remittances received from abroad, aggregated foreign capital and financial resources, gross domestic investment, human capital development, trade openness, capital account liberalization, inflation, public debt, overall infrastructure, financial sector development and quality institutions such as voice and accountability, political stability, government effectiveness, regulation, rule of law and control of corruption.

The overall economic health of a country is measured by gross domestic product (GDP) which takes into account all of the goods produced and services made available in a country over a specific period of time. Although still widely used by economic analysts, it is not without significant shortcomings, including failure to account for welfare of individuals in an economy. GDP only measures market production. However, many countries have a significant amount of home and non-market production. Consequently, alternate measures have been used to gauge economic wellbeing. Two such measures are the GDP per capita and real GDP per capita growth rate. The GDP per capita is a measure that results from GDP divided by the size of the country’s overall population, while the real GDP per capita growth rate is calculated as an annual percentage growth rate.

\textsuperscript{50} Southern Sudan is excluded from the analysis due to lack of data on the variables used in the study.
The two measures provide a much better determination of living standards as compared to GDP alone. This is because national income is naturally proportional to its population such that increase of the number of people is accompanied by an increase in GDP. However, it does not entirely mean that with high GDP, a high standard of living also results. For instance, a country with high GDP but with an overwhelmingly large population will result in a low GDP per capita and equally poor real GDP per capita growth rates; thus indicating a less favourable standard of living for each citizen. On the other hand, a high GDP per capita or real GDP per capita growth rates means that a nation has a more efficient economy. The two measures are therefore a more reliable measure for determining the economic state of a country. They are also especially useful when comparing one country to another, because they show the relative performance of the countries. They are therefore best suited for use in cross-country studies.

However, we acknowledge that there are other better measures of growth such as the inclusive development index (IDI). Developed by World Economic Forum in 2017, the index is an annual assessment of 103 countries’ economic performance that measures how countries perform on eleven dimensions of economic progress in addition to GDP (WEF, 2018). It has 3 pillars; growth and development; inclusion and; intergenerational equity – sustainable stewardship of natural and financial resources. The IDI is a project of the World Economic Forum’s System Initiative on the Future of Economic Progress, which aims to inform and enable sustained and inclusive economic progress through deepened public-private cooperation through thought leadership and analysis, strategic dialogue and concrete cooperation, including by accelerating social impact through corporate action. This variable is not used in the study because data on the same is available for 2018 only and for nine countries only, namely: Burundi, Egypt, Madagascar, Malawi, Rwanda, Tanzania, Uganda, Zambia and Zimbabwe.

Following Barro (1991), Borenzstein et al. (1996) and Levine and Renelt (1992), GDP per capita is used to measure economic growth and represents the dependent variable, while the gross domestic product based on purchasing-power-parity (PPP) per capita GDP calculated at current international dollar, lagged once, measures the initial GDP per capita variable in this study.
The data on GDP per capita are derived by dividing GDP in PPP dollars by total population. Expressed in GDP in PPP dollars per person, GDP per capita at purchasing-power-parity is the sum of gross value added by all producers resident in the economy plus any taxes on products and minus any subsidies excluded in the products’ value. It is calculated by excluding degradation and depletion of natural resources and depreciation of fabricated assets.

The data on GDP per capita are obtained from the World Economic Outlook (WEO) published by the International Monetary Fund. However, the primary sources of the purchasing power parity (PPP) data include the World Bank or World Penn Tables. The data on the GDP at constant US dollars used for computing the technology gap is obtained from the World Bank, World Development Indicators.

The aggregated foreign capital and financial resources may vary from one empirical study to another. In this study, it is represented by the total of net FDI stocks, sum of short-term foreign capital flows and capital transactions, cross-border bank lending, overseas development assistance, aid and remittances received from abroad.

The data for foreign direct investment, measured by the net FDI stocks\(^\text{51}\), is obtained from the annual World Investment Reports published by the United Nations Conference on Trade and Development. The figures are denominated in current US dollars.

The data for the short term capital flows, measured by the sum of short-term capital, net errors and commissions and capital transactions not included in FDI and portfolio investment (where data is available), is obtained from the World Development Indicators and is denominated in current U.S dollars.

Cross-border bank lending is measured by the foreign claims data obtained from the consolidated banking statistics prepared by the Bank for International Settlement (BIS) on ultimate risk basis to track foreign claims of banks headquartered in individual countries that report to the BIS. The cross-border bank lending figures are however not separated into short and long-term lending.

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\(^{51}\) The FDI stock figures are expressed in terms of changes in net FDI stocks from one year to the next to convert the FDI stocks into a flow variable and allow for aggregation with the flows of foreign financial resources.
Data on the cross-border claims used in this study is for end-of-fourth quarter and amounts are expressed in millions of U.S dollars.

The data for remittances, overseas development assistance and official aid received, denominated in current U.S. dollars, is obtained from the World Development Indicators published by the World Bank. The data of aggregated foreign capital and financial resources is transformed into percentage shares of GDP.

The gross domestic investment is measured by the gross fixed capital formation (GFCF) which consists of outlays on additions to the fixed assets of the economy and net changes in the level of inventories. Fixed assets cover improvement of land (drains, ditches, fences, and so on); purchases of machinery, plant and equipment; and the construction of railways, roads, and the like, including hospitals, offices, schools, private residential dwellings, and industrial and commercial buildings (World Bank, 2017). Inventories refers to stocks of goods held by firms to meet temporary or unexpected fluctuations in production or sales, and work in progress. According to the System of National Accounts (SNA) of 1993, net acquisitions of valuables are also considered capital formation (World Bank, 2017). The national accounts data on gross capital formation, expressed in current US dollars, is obtained from the World Development Indicators published by the World Bank. The data figures are however converted from current U.S. dollars into shares of GDP so that they can be used in this study.

We acknowledge that while domestic investment consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories, FDI relates to financing or the purchase of shares in foreign companies where the buyer has a lasting interest (10 percent or more of voting stock). Further, FDI can be used to finance fixed capital formation and it can also be used to cover a deficit in the company or paying off a loan. However, to avoid double counting, the data of domestic investment variable is computed by subtracting the changes in net FDI stocks from the gross fixed capital formation.

The data on the human capital development is measured by the Human Development Index published by the United Nations Development Programme. A similar variable was used by Jongwanich (2007). The Human Development Index (HDI) is a summary measure of average
achievement in crucial dimensions of human development, namely, a long and healthy life, being knowledgeable and educated and having a decent standard of living (UNDP, 2017). The HDI is the geometric mean of normalized indices for each of the three dimensions. The health dimension, measured by life expectancy at birth component of the HDI, is computed using a minimum value of 20 years and maximum value of 85 years. The education component of the HDI is calculated by mean of years of schooling for adults aged 25 years and expected years of schooling for children of school entering age. Mean years of schooling is estimated by United Nations Educational, Scientific and Cultural Organization (UNESCO) Institute for Statistics based on educational attainment data from censuses and surveys available in its database. Expected years of schooling estimates are based on enrolment by age at all levels of education. The expected years of schooling is capped at 18 years. The indicators are normalized using a minimum value of zero and maximum aspirational values of 15 and 18 years respectively. The two indices are combined into an education index using arithmetic mean. The standard of living dimension is measured by gross national income per capita. The goalpost for minimum income is USD 100 (PPP) and the maximum is USD 75,000 (PPP) (UNDP, 2017). The minimum value for gross national income (GNI) per capita, set at $100, is justified by the considerable amount of unmeasured subsistence and nonmarket production in economies close to the minimum that is not captured in the official data. The HDI uses the logarithm of income, to reflect the diminishing importance of income with increasing GNI. The scores for the three HDI dimension indices are then aggregated into a composite index using geometric mean. The data for HDI for some years (2001, 2002, 2003, 2004, 2014 and 2015) is not available. The values for the missing years are proxies by interpolating and extrapolating the data.

In the 2010 Human Development Report a further Inequality-adjusted Human Development Index (IHDI) was introduced. While the simple HDI remains useful, the IHDI is the actual level of human development when inequality is accounted for while the HDI is viewed as an index of potential human development (or the maximum IHDI that could be achieved if there was no inequality). The IHDI is therefore a better measure of human development. However, it is not adopted in our study because data are missing for six COMESA countries with a calculated HDI for 2011 to 2015 (UNDP, 2017). The said countries are Burundi, Comoros, Eritrea, Libya, Seychelles and Sudan. Gender and poverty adjusted human development indices, GDI and MPI, respectively, are equally
important modern measures of human development. However, while data for GDI is also available for the rest of the COMESA countries except Djibouti, Eritrea and Seychelles in 2015 only the data for MPI is not available for Eritrea, Mauritius and Seychelles but available for the rest of the COMESA countries only once in different years. Hence, the HDI data used in the study in not adjusted for inequality, gender disparities and poverty.

The general level of prices or inflation, as measured by the consumer price index, reflects the annual percentage change in the cost to the mean consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as annually. The data is prepared using the Laspeyres formula (IMF, 2017). The data on inflation, expressed in percentage terms, is obtained from the International Financial Statistics (IFS) and data files published by the International Monetary Fund (IMF).

Public debt includes money owed by the government to creditors within the country (domestic debt) and to international creditors (foreign debt). The extent of government debt is measured in two standard ways, namely, net financial liabilities as a percent of GDP or gross financial liabilities as a percent of GDP. On the one hand, gross debt consists of all liabilities that require payment or payments of interest and/or principal by the debtor to the creditor at a date or dates in the future (IMF, 2017). This includes debt liabilities in the form of Special Drawing Rights (SDRs), debt securities, currency and deposits, loans, pensions and standardized guarantee schemes, insurance and other accounts payable. However, this debt excludes liabilities for equity and investment fund shares and financial derivatives and employee stock options. On the other hand, government net debt refers to gross debt minus all financial assets. This study adopts the gross financial liabilities measure of public debt. This is because, not all governments include the same type of financial assets in their calculations leading to wide variations in the definition of net debt and making country-to-country comparisons difficult. The gross debt as a percentage of GDP is also the most commonly used government debt ratio and is the way that the Organization for Economic Co-operation and Development (OECD) measures debt. Debt is valued at nominal, face, or current market values (IMF, 2017). The data on public debt, expressed as a percentage of GDP, is obtained from the World Economic Outlook databases published by the International Monetary Fund.
The data on total trade (exports and imports) is used to measure the trade openness of the economy. The figures, expressed as a ratio of GDP, are obtained from the World Development Indicators published by the World Bank.

The capital account openness is measured by the Chinn-Ito index (KAOPEN). The index, used to measure a country’s degree of capital account openness, was initially introduced by Chinn and Ito (Chinn & Ito, 2006). KAOPEN is based on a five year moving average of the de jure binary dummy variables that codify the tabulation of restrictions on cross-border financial transactions reported in the IMF’s Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). The index is constructed in such a way that the series has a mean of zero and country values ranging from -1.844 to 2.478, where higher values indicate a greater intensity of restrictions on capital account transactions. Our data is based on updated AREAER 2016, which contains the information on regulatory restrictions on cross-border financial transactions as of the end of 2015. The data is obtained from the Chinn-Ito index report.

The financial sector development is measured by the domestic credit to private sector. Domestic credit to private sector refers to financial resources provided to the private sector, such as through loans, non-equity securities purchases, trade credits and other accounts receivables that lead to establishment of a claim for repayment. The data on the variable is expressed as a ratio of GDP and is obtained from the World Development Indicators published by the World Bank.

The quality of overall development infrastructure is measured by the indicator of infrastructure reported under the topic public sector: policy and institutions of the 2nd Pillar (Infrastructure) as reported by The Global Competitiveness Report published by the World Economic Forum (WEF). This composite indicator is derived from the indicators of quality of overall infrastructure, roads, railroad infrastructure, port infrastructure, air transport infrastructure, electricity supply, available airline seat kilometres and fixed telephone lines and mobile telephone subscriptions. The infrastructure indicator is measured in units or scores ranging from 1.0 to 7.0, with higher values corresponding to high quality overall infrastructure.

The quality of institutions is measured by the voice and accountability, political stability and absence of violence/terrorism, government effectiveness, regulatory quality, rule of law and
control of corruption. The voice and accountability reflects perceptions of the extent to which a country's citizens are able to participate in selecting their government, free media and freedom of expression and association. Political stability and absence of violence/terrorism measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism. Government effectiveness reflects perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Regulatory quality measures the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Rule of law measures the extent to which agents have confidence in and abide by the rules of society, in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence. Control of corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as capture of the state by elites and private interests.

The data on the six absorptive capacity factors is reported under policy and institutions section of the World Governance Indicators (WGI) database prepared by the World Bank Institute\(^\text{52}\). The six indicators obtain estimates of a country's score on the aggregate indicator, in units of a standard normal distribution that range from approximately -2.5 to 2.5. A higher score corresponds to better governance outcomes. For most of the years pre-2001, (1997, 1999 and 2001) in the WGI sample, data is missing. Consistent with Lensink et al. (2008), we proxy values for the missing years by interpolating the data. A summary of the panel data types and sources on the various variables utilized in the study are presented in Table 2.2.

\(^{52}\)Data on quality of institutions could also have been obtained from the Country Policy and Institutional Assessment (CPIA) dataset prepared by the World Bank. However, the reported data series runs from 2005 to 2015 and dataset for some COMESA member countries such as Egypt, Libya, Mauritius, Seychelles and Swaziland was missing for period covered by this study. Hence, we did not use CPIA data set.
<table>
<thead>
<tr>
<th>Variables</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP per capita (GDPPC)</td>
<td>International Monetary Fund, (2000-2015)</td>
</tr>
<tr>
<td>Level of general prices (INFLA)</td>
<td>International Monetary Fund, (2000-2015)</td>
</tr>
<tr>
<td>Public debt (PUBDEBT)</td>
<td>International Monetary Fund, (2000-2015)</td>
</tr>
</tbody>
</table>

**Source:** Author's compilation
2.3 Econometric Approach

The impact of foreign capital and financial resources on the growth rate of GDP per capita in the host economy is predicted in linear regressions by the key determinants of economic growth, absorptive capacity and other country level control variables. Given the nature of the data, focus is on estimation methods that are robust to outliers. When estimating the growth model equation, we are likely to encounter several econometric problems. First is endogeneity: If it's possible that good institutions and greater inflow of aggregated foreign capital and financial resources drive growth of GDP per capita, it is also possible that countries that experience sustained growth of GDP per capita are also likely to offer well-developed institutions, human capital, financial sector, quality infrastructure and attract greater inflows of aggregated foreign capital and financial resources. We observe that due to this endogeneity, these regressors may be correlated with the error term.

Second, because of the subjective nature of measurement of some factors that influence GDP per capita growth such as institutional quality, human capital development, financial sector development and development of quality infrastructure, one cannot exclude the possibility of measurement errors in the various indices and proxies which may bias our results.

Third, countries endowed with determinants of GDP per capita growth such as good institutions, skilled human capital, developed financial sector, developed quality infrastructure, can also have other factors favourable for GDP per capita growth, the omission of which exacerbates endogeneity. There may be other factors, such as change in economic policy and political instability that affect both the inflow of aggregated foreign capital and growth of the GDP per capita. If omitted factors determine both the inflow of aggregate foreign capital, financial resources and the GDP per capita growth, one could erroneously infer the existence of a relationship between them.

Because of the endogeneity of some determinants of GDP per capita growth such as institutions, the ordinary least squares estimate of the effect of institutional measures on the growth of GDP
per capita is biased. Obtaining a consistent estimator calls for the use of an instrumental variable for country specific institutions. Since most instrumental variables for institutions are constant over time, suitable instruments to correct for endogeneity are not available. These problems are resolved by moving beyond the methodology currently in use in the empirical literature of GDP per capita growth (mainly fixed or random effects). The GMM-difference method of Arellano and Bond (1991) which allows for use of internal instruments; namely, lagged differences, is applied.

The last challenge is the risk of omitted variables. To that end, a general to specific strategy is followed by estimating an equation with all possible regressors according to the existing literature. Finally, to confirm the validity of the instruments, Sargan’s test of over-identifying restrictions is performed, which is asymptotically distributed as $\chi^2(k)$ where $k$ denotes the number of over-identifying restrictions. A test is also executed to ascertain whether Arellano-Bond orthogonality conditions are fulfilled.

This study specified an autoregressive dynamic panel data GDP per capita growth model of order one (AR(1)) as shown in equation 2.32. The potential importance of choosing an appropriate estimator cannot therefore be over-emphasised. The modern GMM estimation technique suggested by Arellano and Bond (1991) is used to estimate the dynamic panel data model specification of the GDP per capita. This method is called GMM-difference estimator. It is known to account for dynamics and resolve endogeneity problems. It also resolves the short panel bias. This GMM estimator however assumes an absence of second order serial correlation. The method is chosen so as to control for the possible problem of endogeneity that may arise from including lagged explained variables. It also provides a consistent and defined way to develop valid instruments and solve the problem of short panel bias. This approach leads to consistent estimates of the coefficients (Baltagi, 2008). Furthermore, the first-step GMM estimator is used as it has been found to produce more reliable inferences. The asymptotic standard errors from the second-step GMM estimator have been found to have a downward bias (Blundell & Bond, 1998). Arellano and

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53The estimation methods based on the OLS principle are vulnerable to the omitted variable bias if some important determinants of GDP per capita are not included among the regressors.

54Arellano and Bond (1991) offer a more thorough discussion of this estimator. Appendix A1 also elaborates on the estimator.
Bover (1995) argued that GMM difference method obtains estimates that are biased upwards. This leaves us with the alternative to use GMM system estimator, suggested by Blundell and Bond (1998), so as to generate more efficient estimates.

The Arellano and Bond (1991) GMM method uses the differenced data in its estimation procedure to remove the individual effects. The authors argue that there exists a strong autoregressive structure in the error term. This is especially true where the model uses yearly data and the effects of business cycle spread across several years. This is a shortcoming dealt with by taking into account the effects of business cycle by presuming that $\psi_{it} = \rho \psi_{it-1} + u_{it}$, where $|\rho| < 1$, and $u_{it}$ is disturbance term. $\psi_{it}$ are business cycle effects for country $i$ in period $t$ and $\psi_{it-1}$ are lagged business cycle effects. After rearranging the terms, equation 2.28 changes to:

$$Y_{i,t} = (1 - \rho)\tau + (\delta + 1 + \rho)Y_{i,t-1} + Q_{i,t}\gamma - \rho Q_{i,t-1}\gamma + e_t - \rho e_{t-1} + (1 - \rho)u_t + u_{i,t}$$

In equation, 2.28, $\delta$ is the coefficient for the lagged past values of GDP per capita. First differences are essential so as to remove the effects specific to each country. From equation 2.34, the lagged difference in GDP per capita is likely to be correlated with the residual term and this may generate endogeneity of the regressors, $Q$. Caselli, Esquivel, and Lefort (1996) established that some empirical studies neglect the challenges of consistency that may arise from the concurrent presence of the effects specific to each country and the lagged explained variable or any regressor that is correlated with the effects specific to each country. This would occur if equation 2.32 was estimated using random effect (RE) or fixed effect (FE) models. Moreover, Blundell and Bond (1998) posit that persistence in the regressors may have adverse effect on the small sample and asymptotic properties of the GMM difference estimator. To resolve this hurdle, the GMM difference estimator is further combined with an estimator in levels to produce a GMM system estimator. The use of instrumental variables is also required to overcome this econometric problem. However, Arellano and Bond (1991) proposed a procedure to resolve the hurdle and estimate equation 2.34. The first step is to remove the time effect, $e_t$ by deducting from each variable its cross average in period $t$. Next, the variables are transformed into first differences to remove the individual effect:

$$\Delta Y_{i,t} = (\delta + 1 + p)\Delta Y_{i,t-1} + Q_{i,t}\gamma - \rho Q_{i,t-1}\gamma + \Delta u_{i,t}$$

76
where $\delta$, $\rho$ and $\gamma$ are the parameters of the past values of the lagged GDP per capita, business cycle effects and explanatory variables, respectively. Equation 2.32 can then be estimated with GMM utilizing lagged levels of the endogenous variables as valid instruments (Arellano & Bond, 1991). Nevertheless, the choice of instruments is crucial. The GMM difference estimator utilizes the lagged levels of the independent variables as instruments as long as the residual term is not serially correlated and that the levels of the independent variables are uncorrelated with future error terms, that is, weakly exogenous, something which is tested in each specification. If the condition that the independent variables are weakly exogenous fail to hold, which is more likely to happen in the present situation as the higher economic growth may stimulate more foreign capital inflows, both $Q_{it}$ and $Q_{it-1}$, for instance, are correlated with the error term in model equation 2.35. Thus, only levels of variables lagged two periods or more are applied as valid instruments.

Then, in order to calculate the difference estimator, the following moment conditions are applied:

\[ E[Y_{i,t-r} (u_{i,t} - u_{i,t-1})] = 0 \quad \text{for} \quad r \geq 2, t = 3,4,..., 15 \]  
2.36

\[ E[Q_{i,t-r} (u_{i,t} - u_{i,t-1})] = 0 \quad \text{for} \quad r \geq 2, t = 3,4,..., 15 \]  
2.37

This is necessary for the process of estimation as the equation model in levels uses the lagged differences of the independent variables as instruments under two requirements. The first condition is that the disturbance term is not serially correlated. Second, although correlations may exist between the levels of the independent variables and the individual specific error term, the correlation between the error term and the difference in the independent variables is non-existent.

This obtains properties of stationarity shown as:

\[ E[Y_{i,t+m} v_{i}] = E[Y_{i,t+n} v_{i}] \quad \text{and} \quad E[Q_{i,t+m} v_{i}] = E[Q_{i,t+n} v_{i}] \quad \text{for all} \quad m \quad \text{and} \quad n \]  
2.38

According to Blundell and Bond (1998), the validity of the instruments utilized in these regressions is investigated through two tests. The first is the Sargan test of over-identifying restrictions$^{55}$.

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$^{55}$ The Sargan test, also called the Hansen test or J-test for overidentifying restrictions, is founded on the premise that model coefficients are identified through a priori restrictions on the parameters, and tests the validity of over-identifying restrictions. The test statistic can be computed from residuals from instrumental variables regression by constructing a quadratic form based on the cross-product of the residuals and exogenous variables. Under the null hypothesis that the over-identifying restrictions are valid,
which assesses the contemporaneous correlation between the residual and a set of instruments. The second, suggested by Arellano and Bond (1991) is m2 test, which assesses whether or not the residuals from the estimated regressions are first-order correlated but not second-order correlated\textsuperscript{56}.

The study uses inferential statistics, especially F-statistic, to test the hypotheses. In order to generate regression results for the study, Econometric package called Gnu Regression, Econometrics and Time-Series Library (GRETCL) is used. This computer software is chosen because it is simple to use, meets our data analysis requirements, provides results of all diagnostics and is free of costs.

The study adopts the estimation procedure followed by Catrinescu et al. (2009), Choong et al. (2009), Durham (2003; 2004) and Elboiashi (2011), where a factor of absorptive capacity and an interaction term between a factor of absorptive capacity and aggregated foreign capital and financial resources are both included. The interaction process creates new variables by multiplying aggregated foreign capital and financial resources with various absorptive capacity factors (namely, human capital development; trade openness and capital account liberalization; financial sector development; development of quality infrastructure; quality of institutions of voice and accountability, political stability, government effectiveness, regulations, rule of law and control of corruption; technology gap between the host COMESA countries and the technology leader, USA) and the regression results presented in a table.

Further, the regression results are reported together with Sargan test for overidentifying restrictions, Wald test of joint significance, Arellano and Bond (1991) first- and second-order autocorrelation in the errors and adjustment speed of GDP per capita from one period to the next. Following Catrinescu et al. (2009), Choong et al. (2009), Durham (2003) and Elboiashi (2011), a positive (negative) coefficient of the interacted term is interpreted as the marginal increase

\textsuperscript{56}Arellano and Bond (1991) argued that, if the residuals $u_t$ are first-order correlated, then $y_{i,t-2}$ is correlated with $\Delta u_t$ and therefore it cannot be utilized as an instrument. The same holds true of any independent variable which is correlated with $u_t$. 

the statistic is asymptotically distributed as a chi-square variable with ($m - k$) degrees of freedom (where $m$ is the number of instruments and $k$ is the number of endogenous variables).
(decrease) in the impact of net foreign capital inflows on GDP per capita when a particular absorptive capacity factor improves (deteriorates).

2.4 Univariate Analysis

Table 2.3 shows summary statistics. The data features are represented by descriptive statistics that only show the most relevant or important information. Computed over the 2000-2015 period, the statistics are carefully selected and include 304 observations entering the regression estimation, the means, their standard deviations (S.D.) from the mean, the minimum and maximum values.

\[\text{Table 2.3: Descriptive Statistics}\]

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Median</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP Per Capita (PPP US Dollars)</td>
<td>4,911.76</td>
<td>1,835.72</td>
<td>377.20</td>
<td>29,646.10</td>
<td>6,541.35</td>
</tr>
<tr>
<td>Domestic investment (% GDP)</td>
<td>21.15</td>
<td>19.85</td>
<td>2.00</td>
<td>51.79</td>
<td>8.84</td>
</tr>
<tr>
<td>Human capital development (index)</td>
<td>0.46</td>
<td>0.42</td>
<td>0.22</td>
<td>0.81</td>
<td>0.15</td>
</tr>
<tr>
<td>Public debt (% GDP)</td>
<td>65.12</td>
<td>52.67</td>
<td>1.01</td>
<td>202.05</td>
<td>46.17</td>
</tr>
<tr>
<td>Trade openness (% GDP)</td>
<td>76.07</td>
<td>65.50</td>
<td>21.0</td>
<td>225.00</td>
<td>43.04</td>
</tr>
<tr>
<td>Capital account openness (index)*</td>
<td>-0.058</td>
<td>-1.195</td>
<td>-1.904</td>
<td>2.374</td>
<td>1.554</td>
</tr>
<tr>
<td>Inflation (Annual %)</td>
<td>11.41</td>
<td>7.94</td>
<td>0.06</td>
<td>94.96</td>
<td>12.43</td>
</tr>
<tr>
<td>Aggregated foreign capital and financial resources (% GDP)</td>
<td>13.56</td>
<td>9.61</td>
<td>1.79</td>
<td>98.98</td>
<td>13.90</td>
</tr>
<tr>
<td>Foreign direct investment (% GDP)</td>
<td>28.43</td>
<td>20.65</td>
<td>0.00</td>
<td>168.66</td>
<td>29.13</td>
</tr>
<tr>
<td>Short term foreign capital flows (% GDP)</td>
<td>9.33</td>
<td>3.80</td>
<td>0.01</td>
<td>112.44</td>
<td>16.34</td>
</tr>
<tr>
<td>Cross-border bank lending (% GDP)</td>
<td>16.39</td>
<td>7.44</td>
<td>0.14</td>
<td>279.13</td>
<td>37.24</td>
</tr>
<tr>
<td>Overseas development assistance and aid (% GDP)</td>
<td>9.60</td>
<td>7.56</td>
<td>0.01</td>
<td>60.61</td>
<td>9.02</td>
</tr>
<tr>
<td>Remittances (% GDP)</td>
<td>3.04</td>
<td>0.98</td>
<td>0.00</td>
<td>43.51</td>
<td>5.90</td>
</tr>
<tr>
<td>Financial sector development (% GDP)</td>
<td>22.32</td>
<td>16.88</td>
<td>0.20</td>
<td>108.10</td>
<td>19.00</td>
</tr>
<tr>
<td>Overall infrastructure (index)</td>
<td>2.70</td>
<td>2.58</td>
<td>1.52</td>
<td>4.75</td>
<td>0.73</td>
</tr>
<tr>
<td>Technology gap (ratio of GDP)</td>
<td>28.40</td>
<td>25.57</td>
<td>0.63</td>
<td>98.57</td>
<td>23.87</td>
</tr>
<tr>
<td>Voice of Accountability (index)**</td>
<td>-0.88</td>
<td>-1.07</td>
<td>-2.18</td>
<td>0.99</td>
<td>0.72</td>
</tr>
<tr>
<td>Political stability (index)**</td>
<td>-0.69</td>
<td>-0.69</td>
<td>-2.66</td>
<td>1.19</td>
<td>0.94</td>
</tr>
<tr>
<td>Government effectiveness (index)**</td>
<td>-0.77</td>
<td>-0.81</td>
<td>-1.96</td>
<td>1.04</td>
<td>0.61</td>
</tr>
<tr>
<td>Regulation quality (index)**</td>
<td>-0.82</td>
<td>-0.70</td>
<td>-2.26</td>
<td>0.98</td>
<td>0.69</td>
</tr>
<tr>
<td>Rule of law (index)**</td>
<td>-0.71</td>
<td>-0.78</td>
<td>-1.95</td>
<td>1.06</td>
<td>0.64</td>
</tr>
<tr>
<td>Control of corruption (index)**</td>
<td>-0.62</td>
<td>-0.68</td>
<td>-1.71</td>
<td>0.68</td>
<td>0.56</td>
</tr>
</tbody>
</table>

Note: * represents the Chin-Ito index developed by Chinn and Ito (2006) and ** represents the six governance indicators developed by Kaufman, Kraay and Zoido-Lobaton, (1999).

Source: Author’s computations

The median and average GDP per capita are given by USD 1,836 and USD 4,912, respectively. Djibouti had the minimum GDP per capita of USD 377.20 in 2001 while Libya had the maximum GDP per capita of USD 29,646.60 in 2010.
The mean share of the AFCFR to GDP is 13.6%. The minimum AFCFR is 1.8% of GDP (witnessed in DR Congo in 2000), while the maximum is 98.98% (experienced in Seychelles in 2012). FDI has the highest mean (28.4%) and minimum value (0.0%), while remittances has the lowest mean (3.04%) as well as minimum value (0.0%). Thus, remittances forms the smallest component of financial resources.

The COMESA region has attained considerably high average domestic investment (21.0%), with minimum domestic investment of 2.0% to GDP experienced by Zimbabwe in 2006 and 2007 while the highest domestic investment of 51.8% was realized by Libya in 2002.

The human capital development mean of 0.46 is low compared to world average. Ethiopia realized the minimum HDI of 0.220 in 2000 while Seychelles realized the maximum HDI of 0.810 in 2011.

The mean of public debt is 65% of the GDP and the maximum value is 202%. This result means that there are countries that have share of public debt to GDP of more than 100 percent such as Burundi, Comoros, Djibouti, Egypt, Eritrea, Ethiopia, Madagascar, Malawi, Rwanda, Seychelles and Sudan. Measures greater than 100 percent indicate that the country’s public debt far exceeds its income. Seychelles experienced the highest public debt of 202.1% of GDP in 2002.

The average total trade to GDP is 76% and openness of the trade ranged between 21.0% and 225.0% of the share of total trade to GDP. Measures greater than 100 percent point out that the level of international trade for the country far exceeds its income. The COMESA countries are therefore very open. Burundi had the least percentage of total trade to GDP of 21% in 2001, while Seychelles had the maximum percentage of total trade to GDP of 225% in 2009.

The minimum value of Chinn-Ito (KAOPEN) index is given by -1.90 while the maximum is 2.37. The capital accounts of Burundi, Eritrea, Malawi, Sudan and Zimbabwe are the least liberalized while Djibouti, Egypt, Mauritius, Seychelles and Uganda are the most open. The mean of -0.06 implies low capital account liberalization.

The changes in the level of general prices or inflation range between 0.06% per year to 95% per annum. This means that some countries experience low inflation of less than 1%. Libya experienced the lowest annual deflation of 0.02% in 2003 while Zimbabwe had the highest annual inflation of 95% in 2008.
The minimum ratio of access to credit by the private sector to GDP is 0.20%, while the maximum is 108.1%. DR Congo had the lowest percentage of access to credit to private sector to GDP in 2000 while Mauritius had the highest in 2013. This results mean that some COMESA countries, including Mauritius and Zimbabwe, witnessed shares of access to credit by the private sector to GDP greater than 100 percent, far exceeding the countries’ incomes.

The minimum value of infrastructure variable is 1.5 (witnessed in Comoros in 2000), while the maximum is 4.8 (experienced in Mauritius in 2014). The mean of 2.7 is low compared to the expected maximum score of 7.0, implying low competitive infrastructure. The mean technology gap is given by 28.4, minimum 0.63 and maximum 98.6 ratio of GDP. This result means that there is a wide technology gap between some of the host COMESA countries and the technology leaders such as the USA.

The minimum values indicate that governance is negatively skewed, which may impede performance of the economy and have insignificant effect on the impact of AFCFR. Low institutional quality can lower efficiency and competitiveness through capital flight, stops-and-starts in investment projects and by raising uncertainty (Fosu, 2003). Negative means in our sample indicate that COMESA economies perform poorly in terms of governance. This confirms the concern that governance institutions in Africa are on average quite weak. This is consistent with studies that have found strong positive effect of governance on development using governance indicators (Kaufman & Kraay, 2002).

2.5 The Correlations

Presence of perfect or near perfect linear relationship among some or all explanatory variables of a regression may lead to indeterminate regression coefficients and infinite standard errors (Gujarat, 2003). An explanatory variables correlation matrix is used to test the presence of multicollinearity in the dynamic panel data GDP per capita growth model specified in equation 2.32. Table 2.4 presents the correlation matrix for all the independent variables and GDP per capita as the dependent variable. The correlation matrix gives a first basic expectation of the association between these variables.
As depicted in the results in Table 2.4, all the zero-order correlation coefficients between any two regressors are low, ruling out the presence of perfect or near perfect linear relationship. As argued in Gujarati (2003), multicollinearity is a serious problem if the zero-order correlation coefficient between two regressors is in excess of 0.8. The results of the variables correlation matrix 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.

The negative correlation between the current real GDP per capita and the initial GDP per capita confirms case of convergence. The correlations for the six quality of institutions variables of voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption, are very high. This correlations may be due to a causal impact from one variable to another (in either direction) or it may reflect the effect of some unobserved confounding factor such as good government. Intuitively, one might argue that absence of democratic accountability might foster corruption. Damania, Fredriksson and Mani (2004) and Roe and Siegel (2011), show that political instability impairs rule of law, in turn stimulating corruption, while Alence (2004) establishes that executive restraints and democratic contestation affect regulatory quality, government effectiveness and control of corruption. This perhaps offers an explanation of the high correlations among the institutional/governance variables and therefore good governance is expected to correlate with positive outcomes of economic growth.

Panel regression analysis adopted in this study allows for investigation of the strength of these correlations after controlling for other relevant covariates. Consequently, the multicollinearity between these governance indicators precludes the inclusion of more than one of these variables in the same estimation model specification. A series of regressions is fitted, each with a single variable of these governance indicators. Overall, there is no relationship among the other independent variables, implying that the regression obtains determinate coefficient and finite standard errors. All the other independent variables are therefore included in the estimated model specification.

Table 2.4 also shows that GDP per capita is positively correlated to domestic investment, human capital development, trade openness, capital account openness, aggregated foreign capital and
financial resources, financial sector development, development of quality infrastructure, voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption, as theoretically predicted.

Conversely, GDP per capita is negatively correlated with public debt, inflation and technology gap, as theoretically predicted.
### Table 2.4: Correlation Matrix of Variables in Levels

| Variable | GDP PC,\(_i\) | GDP PC,\(_o\) | DIN V | HUM CAP | PUBDEBT | TOPEN | KAO PEN | INFL A | FDI | STFCF | LOANS | ODA AID | REM IT | AFC FR | FSD | INFR | TG | VOA | POS TAB | GOV EF | REG QUA | RUL AW | CO C |
|----------|----------------|----------------|------|--------|--------|-------|---------|--------|-----|-------|--------|--------|--------|-------|-------|-----|------|-----|------|---------|--------|---------|-------|------|
| GDPPC,\(_i\) | 1.000 | | | | | | | | | | | | | | | | | | | | | |
| GDPPC,\(_o\) | -0.007 | 1.000 | | | | | | | | | | | | | | | | | | | | |
| DIN V | 0.314 | 0.325 | 1.000 | | | | | | | | | | | | | | | | | | | |
| HUMCAP | 0.001 | 0.089 | 0.270 | 1.000 | | | | | | | | | | | | | | | | | | | |
| PUBDEBT | -0.164 | -0.112 | -0.225 | -0.186 | 1.000 | | | | | | | | | | | | | | | | | | |
| TOPEN | -0.001 | 0.578 | 0.118 | 0.581 | -0.102 | 1.000 | | | | | | | | | | | | | | | | | |
| KAOOPEN | 0.207 | 0.166 | 0.262 | 0.349 | -0.074 | 0.229 | 1.000 | | | | | | | | | | | | | | | | |
| INFLA | -0.160 | -0.219 | -0.277 | -0.213 | 0.157 | -0.007 | -0.065 | 1.000 | | | | | | | | | | | | | | | | |
| FDI | 0.018 | 0.367 | 0.220 | 0.363 | 0.061 | 0.598 | 0.414 | -0.063 | 1.000 | | | | | | | | | | | | | | | |
| STFCF | 0.031 | 0.303 | 0.007 | 0.351 | 0.110 | 0.565 | 0.110 | 0.037 | 0.432 | 1.000 | | | | | | | | | | | | | | | |
| LOANS | 0.024 | 0.528 | 0.217 | 0.436 | 0.058 | 0.640 | 0.280 | -0.002 | 0.741 | 0.442 | 1.000 | | | | | | | | | | | | | |
| ODAAID | 0.010 | 0.520 | 0.033 | 0.613 | 0.251 | 0.303 | 0.265 | -0.120 | 0.170 | 0.182 | 0.226 | 1.000 | | | | | | | | | | | |
| REMIT | 0.108 | 0.183 | 0.216 | 0.108 | 0.127 | 0.117 | 0.076 | -0.058 | 0.088 | 0.052 | -0.090 | 0.076 | 1.000 | | | | | | | | | | |
| AFCFR | 0.005 | 0.425 | 0.188 | 0.379 | 0.126 | 0.677 | 0.308 | -0.027 | 0.888 | 0.634 | 0.914 | 0.099 | 0.022 | 1.000 | | | | | | | | | |
| FSD | 0.057 | 0.325 | 0.127 | 0.437 | 0.021 | 0.307 | 0.304 | -0.181 | 0.044 | 0.153 | 0.093 | -0.304 | -0.156 | 0.051 | 1.000 | | | | | | | | | |
| INFR | 0.225 | 0.483 | 0.252 | 0.579 | -0.340 | 0.453 | 0.354 | -0.155 | 0.208 | 0.192 | 0.331 | -0.379 | -0.299 | 0.235 | 0.541 | 1.000 | | | | | | | | |
| TG | 0.004 | -0.640 | -0.291 | -0.648 | 0.252 | 0.287 | -0.140 | -0.230 | 0.304 | 0.226 | 0.249 | -0.064 | 0.133 | -0.417 | 0.170 | 0.247 | 0.500 | -0.017 | 1.000 | | |
| VOA | 0.111 | 0.209 | 0.195 | 0.383 | -0.068 | 0.351 | 0.521 | -0.164 | 0.195 | 0.340 | 0.260 | -0.088 | 0.110 | 0.299 | 0.432 | 0.336 | -0.167 | 0.000 | | | |
| POSTAB | 0.117 | 0.438 | 0.128 | 0.554 | -0.077 | 0.625 | 0.386 | -0.072 | 0.382 | 0.429 | 0.349 | -0.202 | 0.050 | 0.427 | 0.343 | 0.423 | -0.182 | 0.59 | 1.000 | | |
| GOVEF | 0.260 | 0.380 | 0.245 | 0.506 | -0.051 | 0.385 | 0.552 | -0.158 | 0.255 | 0.276 | 0.349 | -0.194 | -0.137 | 0.322 | 0.556 | 0.651 | -0.260 | 0.68 | 0.61 | 1.000 | | |
| REGQUA | 0.287 | 0.173 | 0.238 | 0.364 | -0.221 | 0.270 | 0.646 | -0.265 | 0.150 | 0.136 | 0.139 | -0.108 | 0.018 | 0.157 | 0.384 | 0.543 | -0.152 | 0.72 | 0.50 | 0.824 | 1.000 | | |
| RULAW | 0.215 | 0.406 | 0.250 | 0.571 | 0.342 | 0.423 | 0.535 | -0.221 | 0.302 | 0.319 | 0.248 | -0.171 | 0.043 | 0.308 | 0.502 | 0.561 | -0.254 | 0.74 | 0.73 | 0.887 | 0.810 | 1.000 | |
| COC | 0.014 | 0.285 | 0.127 | 0.395 | 0.134 | 0.450 | 0.333 | -0.193 | 0.335 | 0.370 | 0.338 | -0.077 | -0.048 | 0.394 | 0.379 | 0.475 | -0.129 | 0.50 | 0.71 | 0.761 | 0.596 | 0.810 | 1.000 | |

Source: Author’s own computations
2.6 Estimation Results and Discussions

The regression results are presented in Table 2.5. The results suggest that the included variables explain the GDP per capita well as the constant term is not statistically significant. The Arellano and Bond (1991) first- and second-order tests of serial autocorrelation rule out the presence of second-order serial autocorrelation in the disturbance term. Based on the Sargan over-identification restrictions tests, the hypothesis that the errors are uncorrelated with instruments cannot be rejected. The Wald test results confirm that the independent variables are not related to each other and therefore should be retained in the model specification. The lack of second-order serial correlation, validity of instruments variables and unrelated regressors confirm that the models are correctly specified.

The estimated coefficient of the logarithm of initial GDP per capita reported in the first specification is not significant thereby rejecting absolute convergence: poorer economies typically grow faster in GDP per capita terms and tend thereby to catch up to the richer economies. However, the parameters on the logarithm of initial GDP per capita reported in the rest of the specifications are negative and statistically significant, implying a case of conditional convergence that has been reported in various studies, such as Barro (1991) and Mankiw, Romer, and Weil (1992). The convergence is conditional in that it predicts higher growth in response to lower starting GDP per person only if the other explanatory variables are held constant.

The coefficients of the AFRFC on the economic growth is robust, positive and statistically significant at 1%, 5% and 10% levels of significance. The results imply that an increase in the aggregated foreign capital and financial resources leads to a direct rise in the GDP per capita growth. This result is consistent with Bordo and Meissner (2007), Combes et al. (2017), Laureti and Postiglione (2005) and Yasmin (2005) who found that aggregated foreign capital and financial resources exert a significant positive direct impact on the growth of host countries.

The results suggest that increase in domestic investment promote economic growth consistent with economic theory and previous studies by Elboiashi (2011) and Romer (1986). However, inflation has a negative and significant impact on growth, concurring with economic theory and findings by previous studies by Larrain and Vergara (1993) and Elboiashi (2011). Inflation increases costs of inputs and slows down growth.
Table 2.5: GMM-Difference Estimates of the Impact of Aggregated Foreign Capital and Financial Resources on the GDP per Capita in the COMESA Region, 2000-2015

<table>
<thead>
<tr>
<th>Variable</th>
<th>Variant specifications of the GDP per Capita Model</th>
<th>Thres hold</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.107</td>
<td>0.106</td>
</tr>
<tr>
<td>Log Initial GDP per Capita (lnGDPPC&lt;sub&gt;i&lt;/sub&gt;)</td>
<td>-0.284</td>
<td>-0.518</td>
</tr>
<tr>
<td>Log GDP per Capita (lnGDPPC&lt;sub&gt;i&lt;/sub&gt;)</td>
<td>0.316</td>
<td>0.187</td>
</tr>
<tr>
<td>Human capital development (HUMCAP)</td>
<td>0.548</td>
<td>0.536</td>
</tr>
<tr>
<td>Log domestic investment (lnDINV)</td>
<td>0.165</td>
<td>0.292</td>
</tr>
<tr>
<td>Log public debt (lnPUBDEBT)</td>
<td>-0.043</td>
<td>-0.290</td>
</tr>
<tr>
<td>Log Trade openness (lnOPEN)</td>
<td>0.053</td>
<td>0.099</td>
</tr>
<tr>
<td>Capital account openness (KAOPEN)</td>
<td>0.106</td>
<td>(0.399)</td>
</tr>
<tr>
<td>Inflation (INFLA)</td>
<td>-0.128</td>
<td>-0.055</td>
</tr>
<tr>
<td>Log aggregated foreign capital and financial resources (lnAFCSR)</td>
<td>0.590</td>
<td>0.598</td>
</tr>
<tr>
<td>Log financial sector development (lnFSD)</td>
<td>0.033</td>
<td>(0.762)</td>
</tr>
<tr>
<td>Infrastructure (INF)</td>
<td>0.211</td>
<td>(0.018)**</td>
</tr>
<tr>
<td>Log technology gap (lnTG)</td>
<td>0.631</td>
<td>(0.077)*</td>
</tr>
<tr>
<td>Voice and accountability (VOA)</td>
<td>0.108</td>
<td>(0.573)</td>
</tr>
<tr>
<td>Political stability (POSTAB)</td>
<td>0.031</td>
<td>(0.091)*</td>
</tr>
<tr>
<td>Control of corruption (COC)</td>
<td>AFCFR*HUMCAP</td>
<td>AFCFR*TOPEN</td>
</tr>
<tr>
<td>---------------------------</td>
<td>----------------</td>
<td>-------------</td>
</tr>
<tr>
<td></td>
<td>0.745 (0.088)*</td>
<td>0.363 (0.902)</td>
</tr>
<tr>
<td>AFCFR*HUMCAP</td>
<td>AFCFR*TOPEN</td>
<td>AFCFR*KAOPEN</td>
</tr>
<tr>
<td></td>
<td>0.745 (0.088)*</td>
<td>0.363 (0.902)</td>
</tr>
<tr>
<td>AFCFR*FSD</td>
<td>AFCFR*INFR</td>
<td>AFCFR*TG</td>
</tr>
<tr>
<td></td>
<td>0.001 (0.417)</td>
<td>0.073 (0.086)*</td>
</tr>
<tr>
<td>AFCFR*INFR</td>
<td>AFCFR*TG</td>
<td>AFCFR*VOA</td>
</tr>
<tr>
<td></td>
<td>0.073 (0.086)*</td>
<td>-0.007 (0.016)**</td>
</tr>
<tr>
<td>AFCFR*TG</td>
<td>AFCFR*VOA</td>
<td>AFCFR*POSTAB</td>
</tr>
<tr>
<td></td>
<td>-0.007 (0.016)**</td>
<td>0.007 (0.456)</td>
</tr>
<tr>
<td>AFCFR*VOA</td>
<td>AFCFR*POSTAB</td>
<td>AFCFR*GOVEF</td>
</tr>
<tr>
<td></td>
<td>0.007 (0.456)</td>
<td><em>0.265 (0.041)</em></td>
</tr>
<tr>
<td>AFCFR*POSTAB</td>
<td>AFCFR*GOVEF</td>
<td>AFCFR*REGQUA</td>
</tr>
<tr>
<td></td>
<td><em>0.265 (0.041)</em></td>
<td>0.340 (0.054)*</td>
</tr>
<tr>
<td>AFCFR*GOVEF</td>
<td>AFCFR*REGQUA</td>
<td>AFCFR*RULAW</td>
</tr>
<tr>
<td></td>
<td>0.340 (0.054)*</td>
<td>0.278 (0.035)**</td>
</tr>
</tbody>
</table>

Note: \( \rho \)-values are indicated in parentheses with *, **, *** denoting levels of significance at 10%, 5% and 1%, respectively. The Arellano and Bond (AB) Z-statistic tests the null hypothesis that the residuals are first-order serial correlated (AB Z-Statistic test first-order) and the residuals are not second-order serial correlated (AB Z-Statistic test second-order). The Wald test, a joint significance test, tests the null hypothesis that the parameters of time dummies are equal to zero. The threshold of absorptive capacity factors is computed using equation 2.33.

Source: Author’s computations
Regression results also show that the parameters of human capital development is robust, significant and positive at 1%, 5% and 10% levels of significance, implying that improvement in human capital impact positively on economic growth. This finding is consistent with economic theory and is also supported by Benhabib and Spiegel (1994) who observed that high levels of human capital, in terms of school attainment, has a positive effect on GDP per capita growth, especially when combined with technological progress. The positive and significant coefficient of the interaction term between the human capital development and AFCFR, suggests that improvement in human capital development promote economic growth via interaction with AFCFR. The finding also implies that a minimum level of development of human capital, reported as 0.80 in the last column of Table 2.5, is required for aggregated foreign capital and financial resources to contribute positively to GDP per capita growth in the COMESA region. However, the results presented in the second column of Table 2.6 shows that none of the countries in the COMESA region satisfy this threshold.

**Table 2.6: Average Values of the Absorptive Capacity Factors in the COMESA Region, 2000-2015**

<table>
<thead>
<tr>
<th>Country</th>
<th>HUM CAP</th>
<th>TOPE N</th>
<th>KAOP EN</th>
<th>FSD</th>
<th>INFR</th>
<th>TG</th>
<th>VOA</th>
<th>POS TAB</th>
<th>GOVE F</th>
<th>REGQ UA</th>
<th>RUL AW</th>
<th>COC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burundi</td>
<td>0.31</td>
<td>38.87</td>
<td>-1.64</td>
<td>18.39</td>
<td>2.14</td>
<td>63.28</td>
<td>-1.02</td>
<td>-1.73</td>
<td>-1.23</td>
<td>-1.15</td>
<td>-1.24</td>
<td>-1.11</td>
</tr>
<tr>
<td>Comoros</td>
<td>0.44</td>
<td>58.47</td>
<td>-1.19</td>
<td>13.83</td>
<td>1.70</td>
<td>31.24</td>
<td>-0.51</td>
<td>-0.38</td>
<td>-1.54</td>
<td>-1.40</td>
<td>-1.08</td>
<td>-0.81</td>
</tr>
<tr>
<td>Djibouti</td>
<td>0.42</td>
<td>115.20</td>
<td>1.97</td>
<td>24.75</td>
<td>2.34</td>
<td>89.66</td>
<td>-1.12</td>
<td>-0.22</td>
<td>-0.92</td>
<td>-0.64</td>
<td>-0.79</td>
<td>-0.54</td>
</tr>
<tr>
<td>DR Congo</td>
<td>0.31</td>
<td>61.20</td>
<td>-1.16</td>
<td>2.97</td>
<td>2.55</td>
<td>18.13</td>
<td>-1.51</td>
<td>-2.21</td>
<td>-1.67</td>
<td>-1.54</td>
<td>-1.66</td>
<td>-1.41</td>
</tr>
<tr>
<td>Egypt</td>
<td>0.66</td>
<td>50.73</td>
<td>-1.53</td>
<td>42.86</td>
<td>3.27</td>
<td>4.26</td>
<td>-1.04</td>
<td>-0.86</td>
<td>-0.47</td>
<td>-0.41</td>
<td>-0.16</td>
<td>-0.54</td>
</tr>
<tr>
<td>Eritrea</td>
<td>0.35</td>
<td>49.40</td>
<td>-1.19</td>
<td>21.84</td>
<td>2.19</td>
<td>38.18</td>
<td>-1.98</td>
<td>-0.77</td>
<td>-1.25</td>
<td>-1.86</td>
<td>-0.99</td>
<td>-0.24</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>0.32</td>
<td>43.07</td>
<td>1.08</td>
<td>16.98</td>
<td>2.44</td>
<td>54.38</td>
<td>-1.21</td>
<td>-1.46</td>
<td>-0.63</td>
<td>-1.10</td>
<td>-0.74</td>
<td>-0.63</td>
</tr>
<tr>
<td>Kenya</td>
<td>0.49</td>
<td>55.27</td>
<td>-1.24</td>
<td>29.59</td>
<td>2.93</td>
<td>18.50</td>
<td>-0.34</td>
<td>-1.24</td>
<td>-0.54</td>
<td>-0.24</td>
<td>-0.91</td>
<td>-0.96</td>
</tr>
<tr>
<td>Libya</td>
<td>0.77</td>
<td>93.80</td>
<td>-0.26</td>
<td>13.35</td>
<td>2.75</td>
<td>1.19</td>
<td>-1.62</td>
<td>-0.41</td>
<td>-1.21</td>
<td>-1.49</td>
<td>-0.98</td>
<td>-1.07</td>
</tr>
<tr>
<td>Madagascar</td>
<td>0.46</td>
<td>69.93</td>
<td>-1.50</td>
<td>10.37</td>
<td>2.24</td>
<td>34.03</td>
<td>-0.38</td>
<td>-0.30</td>
<td>-0.76</td>
<td>-0.42</td>
<td>-0.53</td>
<td>-0.22</td>
</tr>
<tr>
<td>Malawi</td>
<td>0.37</td>
<td>74.40</td>
<td>1.74</td>
<td>11.91</td>
<td>2.25</td>
<td>54.80</td>
<td>-0.28</td>
<td>-0.05</td>
<td>-0.59</td>
<td>-0.51</td>
<td>-0.24</td>
<td>-0.54</td>
</tr>
<tr>
<td>Mauritius</td>
<td>0.70</td>
<td>120.00</td>
<td>-0.57</td>
<td>80.04</td>
<td>4.22</td>
<td>2.54</td>
<td>0.86</td>
<td>0.86</td>
<td>0.75</td>
<td>0.70</td>
<td>0.95</td>
<td>0.48</td>
</tr>
<tr>
<td>Rwanda</td>
<td>0.37</td>
<td>38.60</td>
<td>1.41</td>
<td>11.79</td>
<td>2.91</td>
<td>41.51</td>
<td>-1.28</td>
<td>-0.71</td>
<td>-0.34</td>
<td>-0.51</td>
<td>-0.64</td>
<td>-0.04</td>
</tr>
<tr>
<td>Seychelles</td>
<td>0.77</td>
<td>186.33</td>
<td>-0.72</td>
<td>26.82</td>
<td>3.14</td>
<td>1.49</td>
<td>0.11</td>
<td>0.81</td>
<td>0.15</td>
<td>-0.60</td>
<td>0.17</td>
<td>0.29</td>
</tr>
<tr>
<td>Sudan</td>
<td>0.38</td>
<td>34.53</td>
<td>-1.19</td>
<td>9.35</td>
<td>2.12</td>
<td>13.12</td>
<td>-1.70</td>
<td>-2.22</td>
<td>-1.31</td>
<td>-1.35</td>
<td>-1.37</td>
<td>-1.25</td>
</tr>
<tr>
<td>Swaziland</td>
<td>0.51</td>
<td>154.73</td>
<td>2.36</td>
<td>20.69</td>
<td>3.65</td>
<td>5.46</td>
<td>-1.30</td>
<td>-0.19</td>
<td>-0.70</td>
<td>-0.51</td>
<td>-0.63</td>
<td>-0.33</td>
</tr>
<tr>
<td>Uganda</td>
<td>0.40</td>
<td>44.20</td>
<td>2.37</td>
<td>11.43</td>
<td>2.39</td>
<td>31.74</td>
<td>-0.62</td>
<td>-1.13</td>
<td>-0.48</td>
<td>-0.13</td>
<td>-0.49</td>
<td>-0.87</td>
</tr>
<tr>
<td>Zambia</td>
<td>0.43</td>
<td>69.20</td>
<td>-1.19</td>
<td>10.50</td>
<td>2.71</td>
<td>16.03</td>
<td>-0.27</td>
<td>0.23</td>
<td>-0.72</td>
<td>-0.48</td>
<td>-0.48</td>
<td>-0.62</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>0.37</td>
<td>85.00</td>
<td>-1.64</td>
<td>44.35</td>
<td>2.63</td>
<td>25.85</td>
<td>-1.43</td>
<td>-1.08</td>
<td>-1.19</td>
<td>-1.92</td>
<td>-1.66</td>
<td>-1.26</td>
</tr>
</tbody>
</table>

*Source: Author’s computation*
This finding suggests that COMESA countries do not provide a comparatively well-developed human capital stock to be able to take advantage of external technology. This explains use of expatriates and technical assistance to bridge the gap in human capital.

The positive and significant coefficient of infrastructure suggests that development of quality infrastructure promote economic growth, confirming past findings of empirical studies by Bernstein (2000), Kinishita and Lu (2006), Lumbila (2005), Munell (1992) and Sanchez-Robles (1998). Further, the result suggests that improvement in quality of overall infrastructure also promote the GDP per capita growth in the COMESA region when interacted with AFCFR. The regression results confirm the hypothesis that the relation between AFCFR and GDP per capita growth is contingent on the development of high quality infrastructure, suggesting that the host economy must attain a certain level of development of the quality of infrastructure to positively gain from AFCFR. The last column of Table 2.5 shows that the certain level of the development of quality infrastructure required equals to 6.53 value of the global competitiveness indicator of overall infrastructure. However, the results presented in the fifth column of Table 2.6 show that no country of the COMESA region achieved the minimum estimated threshold.

The results show that the technology gap (TG) between the COMESA host countries and the USA, world’s technology leader, has a negative and statistically significant coefficient, implying that a wide technology gap between home and host country tends to slow down GDP per capita growth of the host country, as suggested by a number of empirical studies, such as those by Elboiashi (2011), Lim and McAleer (2002), Li and Liu (2005), Li (2005) and Krogstrup and Matar (2005) and UNCTAD (2006), among others.

Additionally, the coefficient of the interaction term of AFCFR with technology gap is significant and negative. This result suggests that a certain level of technological gap, reported as 62.6% in the last column of Table 2.5, is required for AFCFR to contribute positively to GDP per capita growth, confirming Li and Liu (2005) findings. The results presented in the sixth column of Table 2.6 show that only Burundi and Djibouti will positively benefit from attracting AFCFR when the technology gap level is below 62.6%. The rest of the COMESA economies had wide technology gaps.
The results suggest that institutional environment matters for economic growth. The positive and significant coefficients of institutional variables, confirms that political stability and peace, competent and quality public and civil service delivery, better regulation of businesses and market-friendly policies, low prevalence of corruption and graft, and protection of property and contract rights promote economic growth in the COMESA region. This finding concurs with Catrinescu et al. (2009) and Nikhil (2016) who concluded that prevalence of law and order and low levels of corruption had a positive effect on the economic growth of 162 countries from 1970 to 2003. The results are also supported by the IMF (2003) who argued that institutions that support economic development include those that protect the operation of the rule of law and private property rights, lead to low levels of corruption and facilitate all private interactions as opposed to protecting small elite. However, the finding is contrary to Durham (2003) who concluded that institutional variables including business regulation index, corruption index, property rights index and country credit risk had a non-significant effect on GDP per capita growth in 88 low and high-income countries from 1977 through 2000.

Further, the positive and significant parameters of the interaction terms between the institutional variables and AFCFR suggest that the impact of AFCFR on the GDP per capita growth in the COMESA region is contingent on the political stability, bureaucratic efficiency, regulatory quality, prevalence of corruption and graft, and rule of law, protection of property and contract rights. Additionally, the results presented in the last column of Table 2.5 also suggest that political stability, government effectiveness, regulatory quality, control of corruption, and rule of law should reach 1.64, 2.04, 1.85, 1.24 and 1.51 governance score for AFCFR to contribute positively to GDP per capita growth in the region. However, the results presented in the last five columns of Table 2.6 shows that none of the COMESA countries pass these thresholds and hence cannot exploit the positive growth effects of AFCFR more efficiently.

The coefficients of the past values of the GDP per capita are positive and statistically significant at usual levels of significance. This result suggests that the past values of GDP per capita has a positive direct impact on the current GDP per capita. The adjustment speeds are high, between 68.4% and 87.9%, implying that the rate of adjustment of GDP per capita growth to optimal GDP per capita growth is almost immediate.
Public debt, trade openness, financial sector development, government effectiveness have no direct impact on economic growth in the COMESA region. Additionally, the trade openness, financial sector development, and voice and accountability do not influence the growth impact of AFCFR.

2.7 Summary, Conclusion and Policy Recommendations

This study has analyzed the impact of the aggregated foreign capital and financial resources on the GDP per capita growth in the COMESA region over the period 2000-2015. To accomplish this, the study estimated a dynamic panel data GDP per capita model using the one-step GMM-difference estimator suggested by Arellano and bond (1991).

There are three key conclusions drawn from this study. First, while absolute convergence is rejected, the conditional convergence is supported. The convergence predicts higher growth in the COMESA region in response to lower starting GDP per person only if the other regressors are held constant.

Second, the aggregated foreign capital and financial resources variable has a positive and statistically significant impact on the growth of the GDP per capita in the COMESA region. Additionally, the region realizes positive GDP per capita growth from increased aggregated foreign capital and financial resources if human capital development, financial sector development, infrastructure development, technology gap, political stability, government effectiveness, regulatory quality, rule of law and control of corruption reach certain required thresholds. Presence of well-developed human capital, development of high quality infrastructure, low technology gap, political stability and peace, better regulations, effective rule of law and low prevalence of corruption enable the region to absorb and benefit from positive spillovers of aggregated foreign capital and financial resources and grow their GDP per capita. Overall, human capital development is the most important determinant of economic growth in the COMESA region: it has the largest size of the coefficient, given by 0.755.

Third, high past values of GDP per capita, human capital development, quality infrastructure, low technology gap, regulations, rule of law and control of corruption affects region’s growth positively while inflation has adverse effect on GDP per capita.
Based on the findings, the countries of the COMESA region should encourage greater inflow of aggregated foreign capital and financial resources so as to promote GDP per capita growth. They should also consider growing the stock of human capital, embrace development of quality infrastructure, reduce the technology gap between the host COMESA countries and the world’s technology leaders such as USA, and improve quality of institutional environment.

The next chapter presents the analysis of the relative impact of disaggregated foreign capital and financial resources on the GDP per capita in the COMESA region.
CHAPTER THREE: RELATIVE IMPACT OF THE DISAGGREGATED FOREIGN CAPITAL AND FINANCIAL RESOURCES ON ECONOMIC GROWTH IN THE COMESA REGION

3.0 Introduction

Disaggregated foreign capital and financial resources such as FDI, short-term foreign capital flows, cross-border bank lending, remittances, ODA and aid have numerous advantages to the host countries. For instance, 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 (Hayami, 2001; Todaro & Smith, 2003). 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; Findlay, 1978; Jenkins & Thomas, 2002; Mwilima, 2003; World Bank, 2000).

Conversely, FDI may create inadequate employment opportunities and lead into limited capital formation (Adams, 2009), crowd-out or replace domestic investment, lead to balance of payments challenges and create the enclaves economy (Mwega & Ngugi, 2007; Sun, 2002; Ugochukwu, Okore & Onoh, 2013). 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 (Firebaugh, 1992).

The short-term foreign capital flows provide foreign exchange reserves that can be invested in productive activities and capital transactions can boost the investment levels in the host nations. However, abrupt reversal of short-term capital flows can generate output losses and bankruptcies (Reisen & Soto, 2001) and slow down economic growth during the rise and sudden short-term foreign capital reversals (Baharumshah & Thanoon, 2006).
Cross-border lending provide funds for investment and grow the GDP per capita (Durham, 2004). However, these private capital flows distorts production and consumption patterns leading to welfare losses in host countries. This is especially true where lenders advance credit fail to manage credit risks due to their inability to control the poor investment behaviour of loanees (McKinnon & Pill, 1997).

Overseas development assistance and aid can promote GDP per capita growth by boosting savings to finance investment and foreign exchange reserves to finance imports (Iyoha, 2001). It helps to close the gaps in savings and foreign exchange. Foreign savings in terms of aid flow can therefore fill these gaps. ODA and official aid supplement domestic savings and complements domestic resources. For instance, researchers including Chenery and Strout (1966), Papanek (1973), Over (1975), Levy (1988) and Islam (1992) among others argue that ODA and foreign aid fill the foreign exchange gap, provide access to managerial skills and modern methods of production and allow easier access to large exotic markets.

Conversely, foreign aid exerts negative effects on the growth of GDP per capita of recipient nations when consumed by substituting domestic resources. Foreign aid also leads to importation of inappropriate technology, distorts the domestic income distribution and encourages establishment of big, corrupt and inefficient governments in developing countries (Griffin & Enos, 1970; Boone, 1994; Easterly, 1999).

Finally, remittances provide additional foreign exchange and funds for business investment and improvement of human capital development through increasing resources for health and education (Amuedo-Dorantes, Georges, & Pozo, 2008; Edwards & Ureta, 2003; Gitter & Barham, 2007; Woodruff & Zenteno, 2007). However, remittances may result in a limited positive effect on GDP per capita growth if consumed and not invested, induce appreciation in the real exchange rates and reduce domestic output by decreasing labour effort and labour supply (Combes et al. 2017; Jongwanich, 2007).

The impact of disaggregated foreign capital and financial resources on the GDP per capita growth of host countries is therefore conflicting: it may be positive, negative or even indeterminate. The objective of this study is to investigate the relative effect of disaggregated foreign capital and
financial resources on the growth of GDP per capita in 19 developing countries of the COMESA region.

The study covers a period of 16 years running from 2000 to 2015. The following specific research questions: “What is the impact of disaggregated foreign capital and financial resources on the GDP per capita growth in the COMESA region?” and “What is the effect of the absorptive capacity factors on the relative impact of disaggregated foreign capital and financial resources on the GDP per capita growth in the COMESA region?” are answered.

The chapter contributes to the existing literature by providing a deeper analysis of the disaggregated foreign capital and financial resources-GDP per capita growth nexus. This analysis is required because past empirical studies have been carried out in other regions or excluded many COMESA countries from their analysis. The previous studies have also shown that the growth impact of the disaggregated foreign capital and financial resources is conflicting: positive, negative or even indeterminate. To obtain consistent parameters, the one-step generalized method of moments (GMM) technique suggested by Arellano and Bond (1991) is applied to generate regression results.

The rest of this chapter is organized as follows: Section 3.1 presents a review of existing literature on the impact of disaggregated foreign capital and financial resources on the economic growth in the host countries. Literature on the effect of absorptive capacity on the impact of foreign capital and financial resources is also reviewed in this section. An overview of the literature is presented at the end. Section 3.2 describes the methodology utilized in the study. This section describes the theoretical framework, specifies the empirical model estimated, and explains the estimation variables used in the chapter. It also presents the types and sources of data used in the study. Section 3.3 presents the data analysis estimation technique used in the chapter. Section 3.4 presents the descriptive statistics, while section 3.5 explains the correlation of the independent variables. Section 3.6 is the empirical results. Finally, section 3.7 is the summary, conclusion and policy recommendations.
3.1 Literature Review

This section presents an overview of the existing literature on the relative impacts of FDI, short-term foreign capital flows, cross-border bank lending, overseas development assistance, aid and remittances on the growth of GDP per capita in host countries. The literature on the role of absorptive capacity in the disaggregated foreign capital and financial resources-GDP per capita growth nexus is also reviewed. The review focuses on both the theoretical and empirical literature.

3.1.1 Foreign Direct Investment and Economic Growth

Theoretically, FDI can promote economic growth in a number of ways. Some analysts propose that the growth effects of FDI are expected to be two fold (De Mello 1999; Kim & Seo 2003). On the one hand, FDI can affect GDP per capita growth of an economy via accumulation of capital by introducing new products and exotic technology. This viewpoint is held by exogenous growth theorists. According to standard neoclassical growth models, countries with low domestic savings attract FDI to help in the process of accumulation of capital. Such inflow of capital allows COMESA region economies to grow faster than they could with their current financial resources. However, the model suggests that diminishing returns to physical capital occur and lead to growth effects of FDI being limited to the short run.

On the other hand, FDI can promote economic growth via augmentation of the knowledge stock in the host economy by knowledge transfer. This viewpoint is held by endogenous growth theorists. According to endogenous growth models, 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. FDI, theoretically, can therefore play a key role in economic growth via increasing capital accumulation and spillovers or progress of technology (Herzer, Klasen & Newak-Lehmann, 2008).

Empirical evidence on the effects of FDI on economic growth provides conflicting results. However, the literature on FDI advances four explanations to justify the controversy of the empirical evidence on the effects of FDI on GDP per capita growth. Firstly, the effect of FDI on
GDP per capita is dependent on the absorptive capacity of the host country, such as the quality of human capital development, the technology gap, the development of the financial sector, infrastructure and quality of institutions, among others. Thus, the host country requires to reach a minimum threshold of such absorptive capacity, before benefiting from the effects of foreign direct investment on growth (Borensztein et al., 1998; Campos & Kinoshita, 2002; Chakraborty & Basu, 2002; Chudnovsky & Lopez, 2008; Elfakhani & Matar, 2007; Frimpong & Oteng-Abayie, 2006).

Secondly, the types of FDI attracted into a country are key in creating positive externalities to host economies. For instance, Alfaro (2003) argued that the growth effect of FDI depends on operations of FDI. FDI has been seen to contribute positively to GDP per capita growth of the host economy, if it operates in the manufacturing sector, negatively if it operates in the primary sector and the outcome is unclear if it operates in the service sector. Thirdly, Razin (2003) pointed out that the growth effects of FDI are dependent on the quality and type of the foreign capital flowing into the host country, such as loans, FDI and portfolio investment. Lastly, Agosin and Mayer (2000) observed that mergers and acquisitions (M&As) type of FDI results into transfer of the existing assets from domestic investors to foreign investors. Consequently, FDI fails to contribute to capital accumulation or formation of capital and subsequently does not increase the GDP per capita of the host economy.

Many researchers have found direct positive effect of FDI on growth of GDP per capita of host economies. They include Dees (1998) who found that FDI was a key contributor to China’s economic growth; De Mello (1997) who found that FDI has a positive and statistically significant effect on the economic growth of developing countries of Latin America; Campos and Kinoshita (2003) who found that FDI had a positive and statistically significant impact on the GDP per capita growth of twenty five transition countries of Central and Eastern Europe and former Soviet Union and Ogbekor (2005) who concluded that FDI and exports aided in economic growth potential of Namibia.

Some studies conducted in Africa, including the COMESA region, show that FDI exerts a positive impact on the GDP per capita growth of host countries. For instance, Ndoricimpa (2009) examined the interrelationship between growth, exports and FDI in COMESA countries so as to assess the validity of hypotheses of FDI-led exports, Export-led growth, FDI-led exports and FDI-led growth.
in the region. The authors used annual data for a panel of sixteen member countries in the COMESA region: Burundi, Comoros, DR Congo, Egypt, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Seychelles, Sudan, Swaziland, Uganda, Zambia and Zimbabwe over the 1983-2007 period. Using data on the growth rate of real GDP, the ratio of exports of goods and services expressed as a percentage of GDP and the ratio of inward FDI expressed as a percentage of GDP, the authors tested for Granger causality in heterogeneous panels by testing the hypotheses first for homogeneous non-causality and then for homogeneous causality as proposed by Hurlin and Venet (2001, 2003) and Hurlin (2004, 2007, 2008). Further, they utilized the Pooled Mean Group (PMG) estimation method for heterogeneous causality tests, a method proposed by Pesaran, Shin and Smith (1999) and suitable for estimating non-stationary panels. The authors found that FDI exerted a strong positive impact on the growth of the economies of Burundi, Comoros, Egypt, Ethiopia, Kenya, Libya, Mauritius, Madagascar, Malawi, Seychelles, Sudan, Uganda, Zambia and Zimbabwe or fourteen out of the sixteen COMESA countries analyzed in the study. The findings also suggested a strong support for the hypotheses of the FDI-led growth, FDI-led exports and Export-led growth. Thus, generally, policies that promote exports and attract FDI in COMESA member countries should be encouraged so as to foster and sustain growth of GDP per capita in the region.

In turn Seetanah and Khadaroo (2006) examined the association between FDI and the performance of the economies of 39 African countries over the 1980-2000 period using a panel data technique. Results from the static random effects estimates showed that FDI impacted positively on the level of economic growth. The results also confirmed existence of positive link when using GMM panel estimates in a dynamic panel analysis. Mutenyo (2008) assessed the influence of FDI on the GDP per capita in 32 countries in sub Saharan Africa. The author used both a static panel regression with fixed effect and a dynamic panel using the GMM estimator and found that FDI has a positive impact on economic growth but less efficient as compared to the private domestic investment. Alternatively, other authors such as Carkovic and Levine (2002), De Mello (1999) and Katerina, John, and Athanasios (2004) established that FDI had a positive but not statistically significant impact on economic growth of recipient economies.
In contrast, other researchers observed FDI to have a negative direct effect on growth of the host nations. They include Prebisch (1968) and Singer (1950) who 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. Other authors including Bos, Sanders and Secchi (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.

Similar evidence was found in Africa. For example, Agbloyor, Abor, Adjasi and Yawson (2014) examined the relation between private capital flows and economic growth in Africa during the period 1990-2007 using a panel Instrumental Variable Generalized Method of Moments (IV-GMM) estimator to control for endogeneity and heteroscedasticity. They found that FDI, foreign equity portfolio investment and private debt flows had a negative impact on economic growth. They also found that countries with strong domestic financial markets, benefit more since they can transform the negative impact private capital into a positive one. Their results were robust to the control of financial openness and institutional quality.

Additionally, Jugurnath, Chuckun and Fauzel (2016) examined the growth impact of FDI for a panel of 32 sub-Saharan African countries during the period 2008-2014. They used static panel regressions techniques and dynamic panel estimates to assess the causal link of FDI, trade openness, domestic investment, working population size and the effect of the 2009 European debt crisis on the GDP. They found a strong relationship between FDI and GDP.

A more recent study carried out in Pakistan by Saqib, Masnoon and Rafique (2013) investigated the contribution of foreign direct investment on economic growth. The data used for the study ran from 1981 to 2010. Using the least squares estimation method the authors found that Pakistan’s economic performance is negatively affected by FDI.
Besides direct impacts on growth on host countries, FDI has also been found to have indirect impacts on the economic growth of host countries, especially through spillovers. FDI spillovers occur when a foreign investor enters a host country or his presence in the host economy contributes positively to the efficiency benefits and productivity of domestic corporations (Blomström & Kokko, 1998). The literature identifies competition, linkages, labour mobility or skills and imitation or learning by watching as the major pathways of FDI technological spillovers to domestic corporations.

Researchers including Kokko (1994) and Wang and Blomström (1992) pointed out that the spillover channel of competition arises if the existence of FDI intensifies domestic competition, consequently forcing domestic firms to either adopt modern technologies or utilize existing resources more efficiently. De Mello (1997; 1999) argued that foreign direct investments encourage utilization of more advanced technics of production by domestic firms.

The linkages spillovers arise when the FDI result in productivity (horizontal) spillovers on domestic firms within the same industry or in firms in upward and downward industries (otherwise called, forward and backward spillovers)\(^8\). Borensztein et al. (1998) argued that FDI raise productivity by increasing the types and quality of intermediate goods whereas Blomström and Kokko (1998) analysed the complementary activities occurring via backward linkages.

FDI create spillovers by transferring skills and know-how into the recipient economy. This transfer takes place though training of labour, skills transfer and the transfer of best practices of management and organization. Additionally, Fosfuri, Motta and Rønde (2001) pointed out that the effects of skills spillovers of FDI takes place when employees of foreign affiliate corporations who have training in advanced managerial and technical skills move to other local corporations and establish their own firms.

Finally, the learning-by-watching spillovers occur where a domestic corporation improves its productivity by imitating the technical know-how utilized by foreign corporations (Jenkins, 1990; 1992).

\(^8\) See Lall (1978) on discussions on these linkages effects
Wang & Blomström, 1992. The foregoing studies establish that the indirect impact of FDI is analysed through competition, linkages, labour mobility or skills and imitation or learning by watching as the main mechanisms of FDI technological spillovers to local firms.

However, the FDI spillovers may either have positive or negative impact on the economic growth of host countries. Empirical evidence shows that Caves (1974) and Kokko (1994) gave an account of positive effects of spillovers of FDI on economic growth in Australia and in Mexico, respectively. Other studies carried out by Aitken, Hanson and Harrison (1997), Aitken and Harrison (1999), and Saggi (2000) show that FDI creates positive spillovers for domestic corporations. Using panel data on Mexican manufacturing plants and a simple model of behavior of exports to come up with a logit specification for the probability a firm exports, Aitken et al. (1997) investigated the proposition that spillovers related to one firm's export activity minimize the cost of access for other firms to the foreign market. The authors found that while the export activity of multinational enterprises generated spillovers, general export activity did not.

Similarly, Aitken and Harrison (1999) applied panel data on manufacturing plants in Venezuela and established that participation in foreign equity has a positive impact on the plant productivity (own-plant effect), but this association was only robust for the small enterprises. The authors added that foreign direct investment negatively influence the productivity of locally owned plants and observed that the gains from foreign direct investment are wholly captured by joint ventures. FDI is considered by Saggi (2002) as a predominant way of increasing economic growth, since the transfer of technology and knowledge of multinationals contribute to the increase local firms’ productivity.

Kokko, Tansini and Zejan (1996) analyzed manufacturing plants in Uruguay to establish the existence of technological spillovers. The authors found a positive effect of spillovers solely in the sub-sample of domestically-owned manufacturing plants with moderate technological gap as compared to foreign plants. Other recent microeconomic level work by Blalock and Gertler, (2008) and Lipsey and Sjoholm (2004) gave an account of positive results for FDI and productivity.

Blomström and Kokko, (1998) provided a survey of studies examining the FDI effects of learning-by-watching on indigenous firms.
spillovers. Castellani and Zanfei (2001) and Haskel, Pereira and Slaughter, (2002) and Yudayeva, Kozlov, Melentieva and Ponomareva (2000) for example established existence of positive spillovers benefits from foreign direct investment.

Further, some of the empirical evidence on the influence of FDI on growth in the host countries is conflicting at both micro and macro level. Empirical studies at firm level of some countries show that FDI results in either a positive, negative or even indeterminate impact on the GDP per capita growth. For instance, Wilmore (1986), examining a sample of 282 pairs of firms of 80 Brazilian industries, established that FDI had a gainful effect on economic growth, since foreign-owned plants are more efficient than local firms. Furthermore, Blomström (1986) argued that the productivity growth of Mexican sectors was enhanced by FDI. Conversely, Haddad and Harrison (1993) established no evidence of existence of positive FDI spillovers in Morocco. Besides, Aitken and Harrison (1999) and Djankov and Hoekman (2000) revealed negative and non-significant spillovers for Venezuelan firms in the period 1979-1989 and for Czech Republic firms, respectively. According to Hanson (2001) FDI generates weak positive spillovers for recipient economies.

The quality of FDI is critical for the FDI to have a positive growth impact in host economy. UNCTAD (2006) describes quality of FDI as the kind that would significantly increase employment, enhance skills and boost the competitiveness of local enterprises. The quality of FDI can be used to mean the effect a unit of FDI on economic growth. However, this is difficult to measure because it is a function of many factors of many country and projects characteristics which are hard to measure. The conditions of host COMESA countries are used to analyze the quality of FDI in the COMESA region.

The importance of quality FDI is emphasized in some previous macroeconomic empirical studies that reveal that FDI has a positive impact on economic growth of host countries in certain conditions. For instance, both Balasubramanyam et al. (1996) and Zhang (2001) found that FDI has more significant effect on economic growth where the economy is more open and host country has adopted trade liberalization while Borensztein et al. (1998) argued that FDI is an essential mechanism for the technology transfer and leads to positive economic growth when the host
country has a highly educated labour force. Borensztein et al. (1998) also found that, through technology transfer, FDI complement growth relatively more than domestic investment. Utilizing a panel data for a sample of 84 countries for the 1970-1999 period, Li and Liu (2005) concurred with Borensztein et al. (1998) and showed that via human capital, FDI exerted a strong positive effect on growth of the economy. Other researchers including Blomström et al. (1994) found that, among developing countries, from 1960 to 1985, countries that realize higher levels of income per capita experience large positive impact of FDI. Similarly, De Mello (1999) analyzed a panel data (1970-1990) for a sample of The Organization for Economic Cooperation and Development (OECD) and non-OECD countries and found that the FDI-growth nexus is dependent on the substitutability or complementarity between existing and new technologies. This finding means that, if there is high degree of substitutability, as is the case in advanced OECD economies, countries utilize FDI more efficiently and FDI becomes an important determinant of growth. On the other hand, if technologies are complementary to each other, then countries find it difficult to make changes/improvement for FDI driven technology to work well. Consequently, this leads into less efficient utilization of FDI making it a weaker determinant of growth.

In turn, Alfaro et al. (2004), utilizing cross-country data for the 1981-1999 period, found that FDI exerts an indeterminate effect on growth and positive effects are dependent on the quality, efficiency and development of domestic financial sector and markets. Foreign direct investment in the primary sector, however, was found to negatively affect growth, while investment in manufacturing activities has positive effect. Further on conditional association between FDI and growth, Bengoa and Sanchez (2003) used panel data for the period of 1970-1999 of 18 Latin American countries and established existence of a positive correlation between FDI and GDP per capita in the host countries. The authors argued that in order to gain from long-term foreign capital flows, the recipient economy requires, adequate stock of human capital, liberalized markets and stability of the economy. Political and economic stability and the quality of institutions ensure that the host nations benefit from long-term FDI and are therefore important prerequisites for growth (Hall & Jones, 1999; Olofssdotter, 1998; Rodrik, Subramanian, & Trebbi, 2002).

Agbloyor, Gyeke-Dako, Kuipo and Abor (2016) investigated the relationship among FDI, institutions and economic growth in sub-Saharan Africa in various country conditions. They used
a two-step GMM estimator with Weidmeijer corrected standard errors and orthogonal deviations to investigate the empirical relations. They found no evidence to support the hypothesis that FDI promote growth. They also did not find a significant relationship between institutions and economic growth.

Other authors such as Aschauer (1989) and Tondl and Prüfer (2007) contended that, apart from contributing independently to growth, development of quality public infrastructure is condition for FDI to generate growth effects. Our study analyses the effect of human capital development, openness of the economy, development and sophistication of financial systems, regulation quality, rule of law, control of corruption and development of quality overall infrastructure as the most important absorptive capacity factors that influence the ability of the COMESA to absorb and benefit from spillovers of FDI\(^\text{59}\).

Other macro-level studies however found FDI to have either a negative or indeterminate effect on the GDP per capita growth. For instance, Borensztein et al. (1998) revealed that FDI inflows marginally affected growth for a sample of 69 developing economies while Levine and Carkovic (2002) applied a GMM panel data analysis on pooled data drawn from 72 countries in the period 1960-1995 and suggested that FDI does not have a positive impact on growth. Our study concurs with the previous researchers and determines the significance of the impact of the FDI on the GDP per capita growth in the COMESA region.

3.1.2 Short Term Foreign Capital Flows and Economic Growth

Short term foreign capital flows are other investments represented by net short term capital flows, net errors and omissions and capital transactions that are excluded from FDI and portfolio investment. They are reported in the financial account of the balance of payments.

Economic theory contends that the short-term foreign capital and capital transactions can contribute to economic growth in recipient countries. Particularly important are the short-term foreign capital flows that can provide foreign exchange that can be invested in productive activities

\(^{59}\text{See section 3.1.6 ahead for detailed discussion of the absorptive capacity factors}\)
and complement savings while the capital transactions can raise the investment levels in the host nations. According to the neoclassical growth theory, short-term capital flows contribute to accumulation of capital by providing financial resources that bridge the gap between domestic investment and domestic savings. Consequently it contributes to economic growth. However, the neoclassical growth model suggests that the diminishing return to physical capital may limit the growth effects of short-term capital flows to the short run period. The endogenous growth theory predict that short-term capital flows support long-run economic growth through providing funds for investment and acquisition of new technological products.

Economic theory adds that foreign savings and short term capital flows promote GDP per capita growth. They complement to domestic savings and stimulate capital accumulation, raise the recipient economy’s efficiency via improvement of resource allocation, intensifying competition in the domestic economy, interacting with human capital, deepening local financial markets and lowering costs of capital for domestic investors; reduce risks of consumption over different states of nature via enlarging choices for portfolio diversification choices and facilitating for appropriate risk sharing between capital exporters and importers (Reisen, 1998; Reisen & Soto, 2001).

Short term foreign capital and domestic savings are associated with positive long-term economic progress experienced in the East Asian countries in the 1990s. Baharumshah and Thanoon (2002) argued that short-term foreign capital flows benefitted the host East Asian countries by filling the technological and investment gaps and accelerating their economic growth. They also cautioned that such increased inflows, however, may also hinder domestic economic progress when they lead into economic instability and inflationary pressures and widen imbalances in the current account. The large deficits in the current account balance observed in the late 1980s-mid 1990 reflect this savings-investment gap (Baharumshah & Thanoon, 2002). This was demonstrated by the East Asian financial crisis of 1997/98.

Further, Baharumshah and Thanoon (2002) observed that short term foreign capital inflows increased domestic investment, contributing to the achievement of higher growth. This attested to the investment-led growth hypothesis. The hypothesis argues that higher growth invites more investment and more investments attracted further capital flows. This virtuous cycle of capital
inflows and economic growth was indeed an integral part of what was called the Asian miracle. Foreign capital inflows in Asia were channeled to investment as opposed to consumption. The high levels of investment witnessed in East Asia were supported by savings drawn mainly from the rest of the world. The domestic savings rate was already high in most of the countries of East Asia, especially in Malaysia and Singapore, but the rate of investment was even higher. The high investment by both the public and private sectors had contributed to the impressive growth records in the period prior to the financial crisis. These economies achieved average annual rates well above the world’s average growth and also managed to sustain such rates for a long period (Baharumshah & Thanoon, 2002).

Empirical evidence has also shown that short term foreign capital flows have positive significant impact on the growth of recipient countries. Researchers such as Corbo and Hernandez (1996) argued that controls on short-term foreign capital flows may be counterproductive because the deterred flows might contribute to growth. Using data from 18 Asian and Latin America countries, Gruben and Mcleod (1998) showed that an increase in the share of portfolio equity capital flows to GDP is positively and significantly related to domestic savings. Additionally, Hussein and Thirlwall (1999) and Lahiri (1989) established that foreign capital enhances economic growth. The literature has also raised concerns about the deleterious effects of flows of capital on the recipient countries. For instance, Reisen and Soto (2001) showed that reversibility of short-term capital can generate bankruptcies and output losses. Additionally, Calvo (1998), analyzing the mechanics of sudden stops in foreign capital flows, emphasized that negative changes in foreign savings may result in widespread bankruptcies, destruction of domestic channels of credit and make human capital outdated. Presuming that investment is less intensive than consumption in non-tradables, Calvo (1998) argued that the negative effects on the output of a cut in foreign capital inflows are stronger, the higher the share of consumption in the aggregate demand of a country. To the scope that domestic absorption cuts are zeroed in on tradables, there is less requirement for a lower real exchange rate to restore equilibrium of payments. Consequently, the bigger the real exchange rate devaluation, the deeper will be the financial turmoil that ensues. For the same argument, Rodrik and Velasco (1999) observed that greater exposure of short-term debt is associated with more severe financial crises when capital flows reverse.
Further, Baharumshah and Thanoon (2006) provided a quantitative evaluation of the effect of different forms of foreign capital flows on the process of growth of the countries in East Asia. Their empirical examination was founded on dynamic panel data of a sample of eight Asian countries, namely, Malaysia, the Philippines, Singapore, Thailand, South Korea, China, Myanmar and Fiji. The study covered the period 1982 to 2001. The findings by Baharumshah and Thanoon (2006) suggests that short-term capital can hamper economic growth during the surge and unexpected reversals of flows in the Asian emerging economies. The regression results showed that the short-term debt and long-term debt contribute negatively to economic growth, but long-term debt is not statistically significant even at the 10% level of significance. The evidence suggests that short-term capital affects economic growth negatively in long run. The short-term capital inflows also displaces domestic savings (credit and consumption booms) in the long run, and negatively affects economic progress. The short-term inflow parameter carried a negative sign, suggesting that it also displaces domestic saving in the short run, which in turn leads to adverse effect on growth. Additionally, long-term debt positively affects growth but its effect does not hold in the long-term.

Other harmful effects of short term international capital flows on the recipient country’s economy were identified by Kim (2000), who found that a surge in capital inflow tends to cause inflationary pressure and increase current account deficits. The real exchange rate tends to appreciate in the capital-receiving country while the traded goods sector of the economy loses competitiveness in international trade. The increase in the current account deficit and the appreciation of the real exchange rate also make the economy more vulnerable to foreign shocks. When the inflow of foreign capital is interrupted, the economy has to go through reverse adjustments in the current account and real exchange rate. Kondogo (2011) found that the process of adjustment to adverse shocks in capital movement has been highlighted by the widespread costly debt crisis of the 1980s, the Mexican crisis of 1994–1995, and the Asian crisis of 1997–2000.

3.1.3 Cross-Border Bank Lending and Economic Growth

Cross-border bank lending comprise of the short term and long term bank lending. Cross-border bank lending is also an important contributor to GDP per capita growth. Researchers such as Mallick and Moore (2005) posited that bank lending foster economic growth in receiving
countries. Bank lending can also boost investment in infrastructure in physical and social capital. The authors noted that participation of commercial banks in investment projects via lending activities may also raise the expected level of returns of private and social investment, thereby crowding-in additional investment in the private sector. The bank lending can also be accompanied by structural policy reforms, which a country accepts as a condition for being given the loans. Thus bank lending can have a direct influence on the economic growth via the impact of loans on investment, and indirect impact via the related reforms on economic efficiency and growth (Mallick & Moore, 2005). This theoretical view is supported by Gruben and McLeod (1998). Using a panel data of 18 countries in Asia and Latin America, Gruben and McLeod (1998) found that bank lending, portfolio flows and FDI have a significant positive effect on growth of GDP per capita. Further, Reisen and Soto (2001) posited that bank lending, FDI and portfolio investment provide additional financial resources to local investment, and then promote GDP per capita growth in the recipient countries via improvement in allocation of resources, deepening of local financial markets and reducing costs of capital for domestic investors.

There is limited specific literature on the impact of cross-border bank lending on the growth of GDP per capita in host countries. In the empirical literature, cross-border bank lending and other foreign capital components such as portfolio investment and bond flows are usually accounted for in studies analysing simultaneously the impact of various forms of foreign capital on the growth of GDP per capita. Some of the empirical studies include Reisen and Soto (2001) who analysed that effect of FDI, bond and portfolio equity flows, short-term and long-term bank lending and other official flows on the growth of the GDP per capita of 44 developing economies between 1986 and 1997. The authors used GMM panel data in their analysis and found that other official flows and bonds does not exert a significant impact on economic growth. They further noted that short and long-term bank lending have a negative effect on the growth of GDP per capita in the recipient economy, unless the domestic banks hold sufficient capital. Durham (2003) pointed out that the negative impact of bank lending on the growth of GDP per capita can be explained by the volatility which is made up of a major part of its negative total effect on GDP per capita. However, Reisen and Soto (2001) found that flows of portfolio equity and FDI exerted a statistically significant and positive effect on the GDP per capita growth.
Other researchers have examined the relationship between economic growth and several components of foreign capital and financial resources, including foreign portfolio equity and bonds as well as cross-border bank lending, among others. They include Durham (2003) who used a sample of 88 developed and developing countries\textsuperscript{60} between 1977 and 2000 to investigate the impact of bond foreign portfolio investment, total foreign portfolio investment and other foreign investment, which included cross-border bank lending, on GDP per capita growth. The results suggested that bond foreign portfolio investment, total foreign portfolio investment and other foreign investment had no significant impact on the growth of GDP per capita. However, the researchers added that there was some evidence that other foreign investment had a negative effect on the growth GDP per capita depending on the level of financial and legal development of the host country. Further, their results suggested that cross-border bank lending advances (retards) economic growth but only for those economies with comparatively more (less) developed financial systems and more (less) favourable ratings of corruption. Contrary to Durham (2003), Durham (2004) found that equity portfolio investment and FDI do not have any direct impact on GDP per capita growth, although their positive impact is dependent on financial and institutional development, in a sample of 21 high-income and 62 non-OECD countries between 1979 and 1998.

Using a panel cointegration analysis, Macias and Massa (2009) investigated the long-run relationship between economic growth, FDI, cross-border bank lending, portfolio equity and bond issuance on a sample of 28 selected countries in sub-Saharan Africa over the 1980-2007 period. They found that bond and portfolio equity flows have no impact on the growth of GDP per capita but cross-border bank lending exerted a positive and significant impact. Similar findings were reported by Shen, Lee and Lee (2010) who investigated the impact of foreign portfolio investment and FDI on the GDP per capita growth, for a sample of 80 economies, for the 1976-2007 period. The authors found that foreign portfolio investment has no significant effect on economic growth but FDI does. However, Choong et al. (2009) revealed that portfolio investment and foreign debt had a statistically significant and negative impact on economic growth in 12 developed and 32

\textsuperscript{60}See Durham (2003) for the full list of the 88 developed and developing countries.
developing countries\textsuperscript{61}. The results also indicate that markets of stocks are a significant mechanism via which foreign capital and financial resources influence economic growth positively upon reaching a certain threshold\textsuperscript{62}.

On the other hand, using a structural econometric model Gheeraert and Mansour (2005) analysed the association between the growth of GDP per capita and separate types of foreign capital and found that there was a significantly positive association between economic growth and FDI, foreign equity and debt investment and financial derivatives flows. Utilizing a dynamic panel data model on a sample of 126 developing economies between 1985 and 2002, de Vita and Kyaw (2009) analysed the growth effect of portfolio investment flows and foreign direct investment of low, lower middle and upper middle income countries. They found that only developing economies that had reached a certain threshold of absorptive capacity and economic development were able to benefit from growth effects of FDI and portfolio investment flows. Data on portfolio investment is however not available in some years covered by the study and for some countries in the COMESA region. Consequently, this study follows researchers such as Durham (2003), Gruben and McLeod (1998), Macias and Massa (2009) and Reisen and Soto (2001) to analyse the impact of cross-border bank lending on the GDP per capita growth in the COMESA region.

\subsection*{3.1.4 Overseas Development Assistance, Aid and Economic Growth}

The impact of foreign development assistance and aid on GDP per capita growth is analyzed using economic theory. According to Ali (2012) the neoclassical model suggests that there is a positive link between foreign development assistance, aid and GDP per capita growth, as long as the GDP in host country is below its peak transitional growth rate. The critiques argue that foreign assistance and aid facilitates establishment of large and inefficient governments which further deteriorates performance of the economy.

Theoretical prediction of aid positively affecting GDP per capita growth is based on an important axiom that aid is allocated to assist recipient economy grow and improve the wellbeing of its

\textsuperscript{61} See Choong et al. (2009) for the full list of the 51 countries from developed and developing economies.

\textsuperscript{62} The threshold is calculated within the estimation model.
population. Such gain in welfare of the people in a country can be achieved through growth in GDP per capita or poverty reduction or both. This was proved by Feeny (2003) who analyzed the impact of foreign aid on human well-being and poverty via GDP per capita growth in Papua New Guinea during the 1990s. The results suggested that aid has a negative link with poverty through the growth of GDP per capita but the size of such relationship significantly reduces in the presence of income inequality. Additionally, Rajan and Subramanian (2005) found that aid might be used to influence recipient countries. If this is the case, the causality of aid with growth of GDP per capita may be reversed. Their findings suggest that the impact of total aid as a percentage of GDP on the growth of GDP per capita is not statistically significant. Moreover, the authors noted that when aid advanced to allies and aid given to non-allies are analyzed separately, aid to allies has an adverse outcome on the growth of GDP per capita while aid to non-allies has a positive effect.

Overseas development assistance and official aid has been found to affect the growth of GDP per capita of recipient nations both directly and indirectly. Aid complement domestic finance sources such as savings, consequently raising the level of investment and capital stock. This is shown by several researchers who contend that aid has direct positive impact on the growth of GDP per capita of recipient countries. They include Rahnama, Fawaz and Gittings (2017) who integrated unemployment rate, capital formation, degree of trade openness, inflation rate, government budget surplus, and corruption, and using GMM technique, found that foreign aid has a positive effect on growth in especially high-income developing countries.

Alemu and Lee (2015) disaggregated the African data into a panel of 20 middle-income and 19 low-income African countries over a period from 1995 to 2010. Using a dynamic generalized method of moments (GMM) model to address the dynamic nature of economic growth and the problems endogeneity, their results supported the theoretical hypothesis that a positive relationship between aid and GDP growth existed for low-income African countries only. Additionally, they revealed that middle - income African countries experience a greater growth impact from foreign aid, implying that foreign aid stimulate economic growth in such countries by supplementing savings, increasing investment and capital stock.
Employing a cointegration technique Hatemi-J and Irandoust (2005) investigated the link between the growth of GDP per capita and foreign aid for a sample of developing countries. The study covered the period from 1974 to 1996 and indicated that foreign aid exerts a positive and significant outcome on the economic activities for each country in the period of the sample. The authors added that aid supplements local savings and consequently has favourable effects on the real income. Additionally, Irandoust and Ericsson (2005) applied likelihood based panel cointegration technique to analyze data from 1965 to 2000 for 5 less developed African countries. The author found that aid positively affects domestic savings and GDP per capita. Moreover, in addition to contributing to domestic capital accumulation, the authors established that aid reduces foreign exchange gap, creates access to modern technology and allows easier access to foreign financial markets. Collier and Hoeffler (2004) investigated policies and patterns of aid and GDP per capita in 17 societies coming out of civil war. The authors found that both the growth of GDP per capita and aid are responsive to policies.

Moreover, aid effectiveness is conditional to certain characteristics including inflation, budget deficit/surplus, openness of the economy, warfare, economic freedom, among other factors (Ali, 2012). The same view was held by Feeny McGillivray (2008) who investigated the link between aid and the GDP per capita growth in fragile states or economies with critically low ratings of policy and institutional performance and suggested that effectiveness of aid can be seen in several ways. The authors argued that foreign aid experiences falling and negative returns on the GDP per capita growth in highly fragile countries at much lower amounts of aid than in other states; the fragile countries are particularly found to only efficiently absorb about one-third of the amount of foreign aid that non-highly fragile countries can. The authors also found that the effectiveness of foreign aid is influenced by external, climatic, political conditions and the quality of institutions.

In turn, Sakyi (2010) investigated the effects of trade Openness and foreign aid inflows on the GDP per capita growth in Ghana over the post liberation era between 1993 and 2007. Adopting the autoregression dynamic lag (ARDL) bounds testing cointegration approach the author showed that aid has exerted a statistically significant and positive effect on the GDP per capita growth. Similarly, Karras (2006) analysed the link between growth in per capita GDP and foreign aid for a sample of 71 developing economies that received aid. The study covering the period 1960-1997
revealed that foreign aid had a positive, statistically significant and permanent effect on the GDP per capita growth. Specifically, the authors found that a rise in foreign aid by USD 20 per capita leads into a rise in the real GDP per capita growth by 0.16 percent. These regression results are however generated without accounting for the effects of economic policies.

It has also been established that foreign aid has indirect impacts on the GDP per capita growth via several channels. Despite an extensive empirical literature in the area of aid and the GDP per capita growth, few studies specify the mechanisms via which aid affect the GDP per capita growth. They include Morrissey (2001) who proposed that aid contribute to the GDP per capita growth through increasing (a) physical investment and human capital; (b) the ability to import production goods and modern technology; (c) the rate of investment and savings; and (d) facilitating transfer of technology that increases capital productivity and promoting endogenous technological progress. Another study by Gomanee, Girma, and Morrissey (2002) used residual generated regressors to analyze the gross growth effect of aid, taking into account the effect through investment. Their pooled panel regression results for a sample of 25 countries in sub-Saharan Africa covering the period from 1970 to 1997 revealed that foreign aid had a significant and positive effect on the GDP per capita growth, ceteris paribus. The authors determined investment as the single most important transmission channel. They concluded that, overall, a one percentage point rise in the ratio of foreign aid to gross national product contributed to one-quarter of one percentage point to the economic growth rate. Consequently, the poor record of economic growth in Africa cannot be attributed to ineffectiveness of aid but other factors.

On investigating the effects of aid on the GDP per capita growth by controlling for uncertainty for several developing countries that receive aid, Lensink and Morrissey (2000) established that the impact of aid on the GDP per capita growth is critically dependent on the effectiveness of aid on the amount of investment and its efficacy. The authors showed that the uncertainty of aid is statistically significant and negatively linked to the GDP per capita growth and that controlling for uncertainty exerts a significant negative effect on the GDP per capita growth through the amount of investment.
Additionally, on investigating the link between the GDP per capita growth, economic policy and aid in developing economies, Burnside and Dollar (2000) found evidence that the term of interaction between foreign aid and sound institutions and sound economic policies are positive and statistically significant. Aid had a positive effect on the GDP per capita growth in developing economies with sound institutions and sound fiscal, monetary and trade policies but had little or no effect in countries where institutions and policies are poor. The authors defined good or sound policies as the ones that are themselves important for the GDP per capita growth. Intuitively, an incompetent and corrupt government may not utilize foreign aid prudently and donors are not capable of forcing it to change its habits. The authors added that aid is more effective if it is more systematically conditioned on sound economic policies. This finding concurs with Collier and Dollar (2002). However, Dalgaard, Hasen and Tarp (2004) noted that, if the change in the aid effectiveness on productivity is induced by poor initial conditions instead of economic policy, then the effect of foreign aid on productivity in the long term and poverty is optimized by a different rule of allocation. The foregoing studies have identified investment in both physical and human capital, importation of capital goods and technology, institutions and policies as some of the most important mechanisms of transmitting the growth effects of aid. Our study concurs with these previous studies and identifies domestic investment and human capital development as the most important channels through which aid transmits growth benefits to the member states of the COMESA region.

Regression results of some previous empirical studies including Brautigam and Knack (2004), Burnside and Dollar (2000), Mohamed, Kaliappan, Ismail and Azman-Saini (2014), among others, suggested that foreign aid exert an adverse effect on the GDP per capita growth. Mohamed, Kaliappan, Ismail and Azman-Saini (2014) investigated the effect of foreign aid and FDI on the GDP per capita growth of sub-Saharan African countries. The authors applied the generalized method of moments on 41 countries covering the period from 1998 to 2010. The results suggest that while foreign aid has negative impact on the GDP per capita growth, the impact of FDI is positive but not statistically significant. Moreover, foreign aid from various bilateral donors have varying effects on the GDP per capita growth. The findings confirm the view that foreign aid

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63 See Mohamed, Kaliappan, Ismail and Azman-Saini (2014) for detailed list of the 41 sub-Saharan countries studied.
impedes GDP per capita growth instead of promoting it. Specifically, the results support the findings of recent studies such as Liew, Mohamed and Mzee (2012), Neanidis and Varvarigos (2009), Mallik (2008), Burke, Ahmadi and Fredoun (2006) and Rajan and Sumbramanian (2005). Liew et al. (2012) analyzed the impact of aid on GDP per capita growth of five East African countries and also COMESA member states (Burundi, Kenya, Tanzania, Rwanda, and Uganda) over the period between 1985 and 2010. The authors used pooled ordinary least squares (POLS), random effects and fixed effects methods to analyze the panel data. The study used (ODA/GDP) as the measure of aid. The authors controlled for labor, capital and size of government. Their results showed that foreign aid has negative and significant effects on GDP per capita growth of these countries. Furthermore, Mallik (2008) investigated the same issue for Central African Republic, Mali, Malawi, Niger, Sierra Leone, and Togo, the six poorest countries in Africa. Using a time series analysis, the author found that aid has negative effects on long-run GDP per capita growth.

There are also other previous studies such as those carried out by Mosley (1980), Mosley, Hudson, and Horrell (1987), Boone (1996) and Jensen and Paldam (2003), among others, that showed that aid exerts no impact on the GDP per capita growth in recipient countries. Using the meta-analysis of 68 studies generating 543 direct estimates, Doucouliagos and Paldam (2009) found that aid has small positive but not statistically significant impact on the GDP per capita growth. Further, Dollar and Easterly (1999) established that the short- to medium-term linkages between foreign aid, investment and the GDP per capita growth are not statistically significant. The authors concluded that foreign aid does not necessarily provide finance for investment or lead to growth promoting policy reforms. Hansen and Tarp (2000) controlled for investment and human capital and established that aid has no positive impact on the GDP per capita growth. Our study determines the direction and significance of the impact of aid on the GDP per capita growth in the COMESA region. In addition, the previous studies on the impact of foreign aid on the GDP per capita growth do not include foreign direct investment, short-term foreign capital flows and capital transactions or cross-border bank lending in their analysis. We do.
3.1.5 Remittances and Economic Growth

According to the World Bank (2016), remittances are current transfers by migrants who are employed or intend to remain employed for more than a year in another economy in which they are considered residents. They are therefore the sum of personal transfers and compensation of employees. Personal transfers, on one hand, include all current transfers in cash or kind between resident and nonresident individuals, independent of the sources of income of the sender (be it wages and salaries, entrepreneurial activity, property income, social benefits, disposal of assets, among others), relationship between households (be it between related or unrelated individuals), and purpose for which the transfer is made (be it inheritance, alimony, lottery, among others). Compensation of employees, on the other hand, refers to the income of border, seasonal, and other short term workers who are employed in an economy where they are not resident and of residents employed by nonresident entities. The compensation of employees represents remuneration in return for the labour input to the production process contributed by an individual in an employer-employee relation with the enterprise. Compensation of employees is composed of wages and salaries in cash or kind and social contributions by the employer. Compensation of employees is recorded gross and includes amounts paid by the employees as taxes or for other purposes in the economy where the work is performed.

These personal transfers and employees’ compensation support growth in recipient countries through smoothing consumption and augmenting savings and domestic investment. According to Keynesian principles, the amount of transfers which is utilized for consumption is a major determinant of the net growth impact of such transfers. Research has indicated that a big percentage of remittances are spent on consumption in place of productive investment. Consequently, the link between remittances and economic growth therefore can be negative or positive. Remittances may produce positive spillovers via efficient financial markets, easing the constraints of credit for business and individuals or on the contrary, it may grow consumption more than investment and lead to adverse growth effects via low labor participation and low investment.

There is empirical evidence that remittances impact growth positively in Africa. Nyamongo (2012) investigated the role of remittances and financial development on economic growth in a panel of 36 countries in Africa over the period 1980-2009. Using a panel econometrics framework, the
author found that remittances are an important source of growth for these countries in Africa during the period under study. The results showed that remittances complement financial development. However, volatility of remittances was found to have a negative effect on the growth of countries in Africa. Similarly, Gadzar and Kratou (2017) used the GMM-system method of estimation to investigate the effect of remittances on economic growth in a panel of 24 African countries over the period of 1988-2011. The authors found that there is a complementarity between economic growth and financial development, implying that remittances promote growth in countries with developed financial system. They also showed that remittances are more effective in enhancing growth in countries with strong institutions. Chowdhury (2016) examined how remittances can influence economic growth under various levels of financial development. Using dynamic panel estimation of 33 developing countries from 1970 to 2011, the results suggested that remittances are effective in promoting economic growth but financial development has no effect on the remittance-growth nexus.

Utilizing panel data set of Albania, Bulgaria, Macedonia, Moldova, Romania and Bosnia Herzegovina over the 1999-2013 period to observe the impacts of remittances on economic growth, Meyer and Shera (2017) found that remittances have a positive impact on growth and that the higher the levels of remittances relative to GDP the higher the impact. A similar study was conducted by Matuzeviciute and Butkus (2016) who used an unbalanced panel data covering a sample of 116 countries with different development levels over the period 1990-2014 to study the interaction between remittances and the level of economic development and its impact on long-run economic growth. To control the endogeneity while estimating the impact of remittances on long-run economic growth, the authors used ordinary least squares with first differences transformation and fixed effects approaches and other controls of long-run growth. Their results showed that in general remittances have a positive impact on long-run economic growth, but the impact differs based on the country’s economic development level and the abundance of remittances in the economy. Nikhil (2016) attempted to identify an econometric model that properly portrays this relationship and analyse the effect of external development finance and foreign exchange earnings on economic growth in South Asia. The author developed a fixed effect panel model using data of Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka ranging from
1960 to 2014 and findings suggested that only remittance have a consistent positive effect on growth.

Empirical evidence also point out that remittances foster economic growth via their positive effect on savings, investment and consumption. A number of previous studies proved this assertion. For instance, a study by Ramirez (2008) analyzed the impact of remittances on the economic growth of selected upper and lower income Latin American and Caribbean countries and found significant positive impact of remittances on economic growth in both groups of countries. Remittances also spur growth through the mechanism of savings and investment. Since remittances help in income smoothening, it creates demand for goods and services; which in turn generates employment opportunities but these benefits are conditional on sufficient excess capacity utilization. A similar study by Adams (2002) used panel data covering a period of five years to investigate rates of savings of seven various sources of income, including remittances, by rural households in Pakistan. The author found that the households save from separate income sources at marginal rates that significantly differ across the income sources. The author particularly found that between 1980 and 1990, the marginal propensity to save (MPS) was higher (0.711) for incomes obtained from remittances received from abroad as compared to the MPS for incomes accruing from local remittances from urban to the rural areas (0.49) or incomes from rent investment (0.085). According to the model of precautionary saving, these variations in rates of savings from various income sources owe to uncertainty with less variable income saved at a lower marginal rate and the vice-versa. The author noted that the rural household in Pakistan are faced with challenges of incomplete markets of credit and capital and hence save incomes from sources that are more variable and uncertain. Equally high marginal propensity to save income obtained from remittance was established by Roberts et al. (2004: quoted in Mallick, 2008) in Armenia. The authors found that the remittances income marginal propensity to save was consistent and as high as 0.40.

Remittances received from abroad also contribute to high economic growth rates through raising the levels of income by the mechanism of multiplier effects of consumption, which have lasting effects on households who do not receive the remittances (Mallick, 2008). Desai, Kapur and McHale (2004) added that extra consumption particularly raises receipts obtained from indirect taxes, thereby raising the levels of savings and consumption by the government.
Empirical evidence show that remittances impact on growth via expansion of investment. For instance, Amuedo-Dorantes and Pozo (2006) showed that remittances provide extra foreign exchange that can be utilized in financing private investment and Lucas (2005) analysed several case studies and concluded that remittances accelerated investment in India, Morocco and Pakistan. Modelling the impacts of remittances on the investment and incomes in seven Mediterranean countries, Glytsos (2002) observed that rates of investment rise with rise in remittances in six out of the seven countries. Further, the regression results of the analysis carried out for eleven transition economies of Eastern Europe by Leon-Ledesma and Piracha (2004) using data covering the period from 1990 to 1999 revealed that remittances exert a positive impact on employment and productivity through acceleration of domestic investment\(^{64}\). Other scholars who found evidence of a positive association between remittances and growth include Catrinescu et al. (2009), Jongwanich (2007) and Pradhan, Upadhyay, and Upadhyaya (2008), among others. The foregoing empirical evidence is supported by Ratha (2003) who holds the view that net inflows of remittances impact on savings and investment. Thus, remittances influence savings, private consumption and investment through their growth effects.

Woodruff and Zenteno (2007) and Yang (2004) argued that remittances decrease constraints of credit of receipts of households to raise entrepreneurial activities and investment by private investors. Jongwanich (2007) underscored that households in developing economies are particularly faced with inefficient financial and credit markets, making access to markets of credit difficult. Migrant remittance net inflows from abroad enable households to set up entrepreneurial activities. Besides funding physical investment, a number of authors including Edwards and Ureta (2003), Gitter and Barham (2007) and Jongwanich, (2007), among others, showed that remittances are utilized to fund education and health, which in turn promotes growth.

Remittances can also improve the creditworthiness of a country. Ratha (2007) argued that improved country’s creditworthiness is an important mechanism through which increased net inflows of remittances enhance the economy’s access to world capital markets for financing developmental projects such as infrastructure. The calculation of country credit ratings by world

\(^{64}\)See Banaian and Roberts (2004) and Giuliano and Ruiz-Arranz (2005) for detailed discussion.
rating agencies is subject to the size of remittance flows such that the higher the size of flows of remittances the better the rank of credit rating the country could obtain, and the vice-versa (World Bank, 2006). Utilizing calculations of models of ratios of debt to exports that also incorporated remittances proved that the inclusion of remittances in assessment of creditworthiness improved credit ratings for Haiti and Lebanon and led to reductions of sovereign spread from 130 to 334 basis points. Jongwanich (2007) added that improvement in the creditworthiness of a country provides another way of raising human and physical investment and enhance growth.

Finally, multiplier-effect has also been identified as an important channel through which net inflows of remittances generate positive effects to economic growth in recipient countries. Jongwanich (2007) emphasized the importance of forward and backward linkages in investment activities. The author also pointed out that an increase in investment by one household could lead into a rise in the income of other households. According to the principle of increasing returns to scale, the growth of one sector could lead to an expansion of the size of other sectors and consequently higher economic growth rates.

Many past studies show that there exists a positive relationship between remittances and household investment in many developing economies. For instance Brown (1994) analysed the utilization of remittances by households to investigate the relationship between remittances, savings and investment in the island countries of Tonga and Samoa. The author found that remittances contributed significantly to savings and investment in the two island countries. The finding also suggests that remittances are responsive to financial incentives and interest rate differentials between home and host countries. Using a life-cycle model Mesnard (2004) analysed the effect of remittances in the economic growth of Tunisia and found that workers with limited access to financial markets utilized remittances for investment purposes. This means that remittances ease the constraints of credit of such workers. The results also suggested that the migrants who invest after coming back home, accumulate more savings than salaried migrants (Mesnard, 2004). Further, Yang (2004) pointed out that net inflows of remittances improve child schooling, increase expenditure on education, reduce child labour and finance investment. Other researchers including Faini (2002), Stark and Lucas (1988) and Taylor (1992) established that remittances and economic growth in recipient countries are positively related.
However, there are cases where remittances have not had any significant impact on economic growth of recipient countries. A number of studies including Ahlburg (1991) and Stark and Levhari (1982) show that remittances are mainly utilized for consumption, construction of houses, repayment of debts and even financing of future migration. Accordingly, remittances increase levels of consumption without promoting domestic economy. Stark and Levhari (1982) noted that even in cases where remittances expand investment, the insurance cover provided by the migrant workers allows households at the source to invest in riskier income-generating activities. This is likely to result in lack of investment in productive activities and generation of limited economic growth in recipient countries.

A steady rise in net inflows of remittances improve the incomes of recipient households. However, this may eventually substitute wages and other incomes derived from working as some of the households that receive remittances are discouraged from more work. This could decrease supply of labour and contract economic growth. Altruistically motivated remittances compensate their recipients for adverse economic outcomes and create incentives that support moral hazard problem. This is because remittance transfers are conducted under situations of asymmetric information in which the remitter of the transfer and recipient of the same are put apart by vast distances. This could court moral hazard hurdles where the recipients are reluctant to participate in the labour market by reducing labour effort and limiting their job search. In a study covering 113 nations over the period 1970 to 1998, Chami et al. (2005) used a variety of fixed effects models to establish that workers’ remittances exert a significant negative effect on economic growth because of moral hazard problem. The authors also found that this problem is not limited to households, even governments take important policy decisions in anticipation of continuous inflow of remittances in future. Such policies can prove to be harmful because sudden discontinuity in remittances can create serious financial problems for governments. This finding proved the severity of the problem of moral hazard in remittances. Based on this finding, the authors demonstrated that remittances do not provide capital for economic development but compensation for poor economic outcomes of host countries.

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65Moral hazard problem occurs when in anticipation of continuous future inflows of remittances, recipients start providing less labor.
There is empirical evidence that large volumes and sustained inflows of remittances are likely to cause appreciation of the real exchange rate or even postpone depreciation of the rate of exchange and lead to less profitability in the production of tradable goods sector (Acosta, Larney & Mandelman, 2009; Amuedo-Dorantes & Pozo, 2004; Combes et al. 2017; Lopez, Molina & Bussolo, 2007). This problem is called the Dutch Disease. Acosta et al. (2009) developed a dynamic stochastic general equilibrium model to analyse the impact of remittances in emerging market economies. The authors found that regardless of the motives, remittances from abroad are associated with reduction in labour supply and increases in demand for non-tradable commodities as a result market for non-tradable commodities expands and attracts labour. They also found that remittances are beneficial for household welfare through smooth income flows.

Using a panel of 13 countries of the Latin America and Caribbean Amuedo-Dorantes and Pozo (2004) analysed the effect of migrants’ transfers on the real foreign exchange rate. The results showed that workers’ remittances restrict performance of exports and limit output and employment of the countries that receive remittances by reducing their export competitiveness. Comes et al. (2017) established that the effect of real exchange rate appreciation of remittances is twice as big as the effect of aid, and ten times bigger than the effect of FDI. In a cross-country study of 8 countries in Latin America over the period from 1990 to 2003, Lopez, Molina and Bussolo (2007) analysed the impact of remittances received from abroad on real exchange rate appreciation. The authors used an instrumental variables method to control for endogeneity and reverse causality and established that a 1 percent rise in the ratio of remittances to GDP would result in appreciation of real effective rate of exchange by a significant magnitude of between 18 and 24 percent. Fajnzylber and Lopez (2007) found that appreciation of real exchange rate accompanied increase in remittances for the period between 1993 and 2005 in 7 out of 8 Latin American countries with the highest ratio of remittances to GDP, excluding Nicaragua. This appreciation of exchange rates adversely affected the export competitiveness of these economies. The findings of the foregoing studies compare well with results generated by models of Dutch Disease or Resource Boom, where discoveries of resources result in appreciation of real rate of exchange and shifting of resources from the traded sectors of the economy to the non-traded ones.
Some studies obtain limited impact of remittances on economic growth. For instance, Glytsos (2005) studied 5 countries for the period of 1969-1998. Using two-stage least squares (2SLS) estimation method, the author found that fluctuations in remittances are associated with fluctuations in growth. Moreover, the negative effect of fall in remittances is higher than positive impact of its rise. Remittances were also found to be associated with rise in standard of living in recipient countries. Remittances can have an indirect adverse effect on labor supply. This could decrease economic growth via decreased supply of labor. Furthermore, consistent and large volumes of remittance inflows could lead to less profitability of exports via appreciated real rate of exchange. For developing Asia and pacific countries, Jongwanich (2007) found that remittances can raise standard of living if recipients are relatively poor. Since migration is dear, poor people are least likely to be recipient of remittances from abroad hence the gains of welfare might be insignificant. Further, Nishat and Bilgrami (1991) analyzed the impact on remittances on economic growth in Pakistan over the period between 1959-1960 and 1987-1988. The results show that remittances have a strong positive impact on gross national product (GNP), investment, consumption and imports. The authors argued that remittances grow the dependency on imports via rise in import content of consumption demand and worsen the problems of balance of payments.

Several empirical studies reveal that remittances have negative or no impact on economic growth of the recipient economy. They include Barajas, Chami, Fullenkamp, Gapen & Montiel (2009), Chami et al. (2005) and IMF (2005b) who found a zero or negative relationship between remittances and growth in recipient economies. Other scholars such as Spatafora (2005) investigated the impact of remittances on economic growth in 101 countries for the period 1970 to 2003. Using an instrumental variables method to account for endogeneity, the authors found no statistically significant relationship between foreign remittances and either per capita output growth, investment or education. Additionally, the author cautioned that establishing the impact of remittances on growth, investment or education is complicated by presence of endogeneity and reverse causation (where remittances may both determine and be influenced themselves by GDP growth, investment and education). Our study determines the direction and significance of the impact of remittances on the GDP per capita growth in the COMESA region.
3.1.6 Effect of Absorptive Capacity on the Relative Impact of Disaggregated Foreign Capital and Financial Resources on the Economic Growth in the COMESA Region

Foreign capital can render indirect and spillover benefits to recipient countries. The indirect impacts are realized through either expansion of domestic investment, provision of resources to education, health and social services so that human capital improves or through positive spillovers. Spillovers are broadly defined as the effect of presence of foreign capital on domestic economic performance. For instance, an increase in the productivity of domestic firms as a result of increased presence of foreign firms and FDI activities in the domestic economy. It is argued that the existence, sign and magnitude of spillovers to domestic economy depend on several factors related to the characteristics of the foreign capital, conditions of the recipient countries and characteristics of firms and sectors in the economy (Crespo & Fontoura, 2005). One of the most important factors is the absorptive capacity. This is because first, the benefits of foreign capital requires to go through a process of conversion before becoming spillovers of the host economy, a process that requires existence of sufficient absorptive capacity in the recipient economy. The absorption process entails the integration of foreign capital in a given recipient economy. According to Kalotay (2000) absorptive capacity refers to the highest amount of disaggregated foreign capital and financial resources that can be integrated into the economy of a host country and result in a positive economic performance.

Second, the absorptive capacity determines the effectiveness and quality of disaggregated foreign capital and financial resources. The literature emphasizes the importance of absorptive capacity when determining the ability of a host economy to benefit from disaggregated foreign capital and financial resources. It is argued that disaggregated foreign capital and financial resources produce positive effects on economic growth only when the absorptive capacity factors of host economies, sectors and firms are sufficient. Some of the absorptive capacity factors include human capital,

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66 See Crespo and Fontoura (2005) for detailed analysis of other factors including the level of development of host country, distance and transport costs, trade policy, intellectual property rights, entry mode of especially FDI, Nationality of FDI, degree of foreign ownership or control, export capacity of domestic firms, size of domestic firms, among others.

67 The quality of disaggregated foreign capital and financial resources is used to mean the effect a unit of disaggregated foreign capital and financial resources on economic growth.
economic stability, liberalized markets, financial sector development, level of technology, trade openness, capital account openness, development of quality infrastructure and institutional quality. Additionally, the factors of absorptive capacity should reach a certain threshold in order for foreign capital to have a positive impact on the GDP per capita of the recipient economy. This study determines a certain threshold reached by some or all absorptive capacity factors chosen in order for the foreign capital to have favorable impact on the per capita GDP growth in the COMESA region.

The absorptive capacity of a host economy is described on two levels. First, is the absorptive capacity of local firms involving the intensity of technology and qualified labour (Cohen & Levithal, 1990; Girma, 2005). The second is the country-level absorptive capacity that comprise the technological gap, financial and institutional development, human capital development, (Borenzstein, 1998; Fu, 2008; Hermes, 2003; Keller, 1995). Empirical studies about absorptive capacity have either focused on particular countries such as Argentina, Great Britain and United States of America or regions, including Central Europe or even a group of developing countries and/or developed countries.

Empirical evidence on the link between growth and components of foreign capital and financial resources in host economies has shown that it is very important to control for absorptive capacity. This study explores human capital development, Openness of the economy, financial sector development, development of quality infrastructure, technology gap, institutional governance quality as key absorptive capacity factors influencing the ability of the COMESA region to absorb and benefit from spillovers of FDI, financial resources and promote GDP per capita growth rate. Data on these variables is also readily available for the period under study. The study investigate whether some or all absorptive capacity factors chosen enable the region to absorb and benefit from FDI, some or all of the financial resources and promote GDP per capita growth or not. The absorptive capacity factors are discussed in more detail in turn.

**Human Capital Development**

According to the neoclassical and endogenous growth theory, besides capital and technological progress, labor is a key ingredient in the economic growth process. However, the efficacy of labor
in contributing to growth is defined by the availability, cost and quality of the labor force. This explains why low-cost, unskilled labor is becoming less important to domestic and foreign investors. According to Pigato (2000) there is increasing demand for human capital equipped with varied new skills that can cope with new technologies. Flexibility of the market of labor including the utilization of expatriate personnel is also important.

Human capital development is an important channel for transferring and receiving benefits of disaggregated foreign capital and financial resources in the host countries. According to Blomström and Kokko (2003) labour force in terms of human capital and education allows for absorption and adaptation of foreign technology and generation of sustainable economic growth in the host countries. Human capital development is therefore required to promote the absorptive capacity of local firms and the economy as a whole. The benefits of foreign capital such as FDI are transferred to human capital development via training, learning by doing and work experience accumulation. The human capital development provides the force required to implement the technology and know-how conveyed by the foreign capital. Better skilled and educated labour is likely to allow for efficient and effective reception of new technology and achievement of better economic performance. Researchers such as Van den Berg (2001) advanced that the ability of an economy to create new knowledge and ideas and adapt old knowledge and ideas is determined by the quality of the labour force. The author added that high quality labour force is required to install projects especially at the stage of disbursing investment. The author also observed that the shortage of qualified people may lead to a slow and stuck installation of development projects. Low skilled and educated workers negatively impact on investment disbursement and adversely affect the ability of the host country to promote FDI. Further, Chen (1990) observed that host economies with high quality and higher amounts of human capital investment are able to gain more benefits from FDI.

Other researchers who hold a similar view include Borensztein et al. (1998), Xu (2000) and Balasubramanyam et al. (1996). For instance, Borensztein et al. (1998) investigated the effect of FDI on economic growth in 69 developing countries applying cross-sectional and cross-country regressions. The authors applied panel data for twenty years (1970-1979 and 1980-1989), and estimated the regressions utilizing cross-section regressions and the seemingly unrelated
regressions method (SUR). They found that FDI is a critical channel in technology transfer, but the effectiveness of the FDI is dependent on the human capital stock in the host economy. The authors observed that FDI had a positive contribution to economic growth only in countries where the stock of human capital is above a certain threshold with a highly qualified workforce. The host economies with low stock of human capital experienced negative direct effects of FDI on economic growth. Similar findings are also reported by Xu (2000) for 40 economies (20 developed countries and 20 less developed countries) between 1966 and 1994. The author examined the effect of the presence of the affiliates of the multinational corporations on the productivity growth of the host economy. The authors applied the panel data two stages least square (2SLS) technique and established that developing countries gain positively from transfer of technology offered by US multinational corporations but not in less developing countries. The author concluded that less developing countries do not reach the required minimum threshold of human capital. In turn, Balasubramanyam et al. (1996) found that FDI had a positive and significant impact on economic growth subject to achievement of a certain threshold of human capital stock in the recipient country. The authors also observed that FDI complements local investment. Utilizing a panel data for 84 countries from 1970 to 1999, Li and Liu (2005) established that the interaction of foreign direct investment with the stock of human capital exhibited a statistically significant positive impact on economic growth. The foregoing literature review suggests that, in order to obtain the benefits of disaggregated foreign capital and financial resources, the recipient country require minimum threshold of high quality of human capital stock.

Majority of the foregoing studies have been carried out in regions other than COMESA. A study by Ndoricimpa (2009) investigated the interrelationship between FDI, exports and economic growth in 16 COMESA countries so as to assess the validity of hypotheses of FDI-led growth, FDI-led exports and export-led growth and in that region. The study uses annual data for a panel of 16 COMESA countries, namely, Burundi, Comoros, DRC, Egypt, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Seychelles, Sudan, Swaziland, Uganda, Zambia and Zimbabwe for the period 1983-2007. The author tested for Granger causality in heterogeneous panels by testing first for homogeneous non-causality and homogeneous causality hypotheses as suggested by Hurlin and Venet (2001, 2003) and Hurlin (2004, 2007, 2008). The author then applied the Pooled Mean Group (PMG) method for testing heterogeneous causality, a method proposed by
Pesaran et al. (1999) and found suitable for estimating non-stationary panels. The authors found that FDI had a strong positive effect on 14 member countries of COMESA region, namely, Burundi, Comoros, Egypt, Ethiopia, Kenya, Libya, Mauritius, Madagascar, Malawi, Seychelles, Sudan, Uganda, Zambia and Zimbabwe. The findings also suggested that the countries that benefited most from FDI had highly-developed human capital bases. It is also clear that there are many empirical studies on the effect of foreign capital on growth. However, most of the empirical studies have focused on FDI. Additionally, the literature on the foreign capital-growth nexus seems to have ignored the important role of the human capital development on the growth effect of either aggregated or disaggregated foreign capital and financial resources such as short-term foreign capital flows, cross-border bank lending, remittances and foreign aid. This study extends the analysis to include aggregated foreign capital and financial resources, short-term foreign capital flows, cross-border bank lending, remittances and ODA and aid.

The level of human capital development can be measured by a number of proxies including the cost of labor (wages), size of labor force (population in the age group between 15 years and retirement age), education (measured by years of schooling, enrollment rates in either secondary school or both secondary school and tertiary colleges), among others. Empirical evidence shows that some authors use years of schooling (Borensztein et al., 1998; Mwega & Ngugi, 2007), secondary school enrollment (Adams, 2009) and enrollment in tertiary and other institutions of higher learning. Though very popular, these measures of the human capital development may not represent all dimensions of human capital development. For example, the enrollment rates and the years of schooling exclude health and income per capita dimensions of human capital development. Owing to these limitations, this study uses Human Development Index (HDI)\(^{68}\), supplied by the United Nations Development Programme (UNDP) to represent human capital development. The HDI is a better measure of the level of human capital development as it covers wider aspects of human development, including being knowledgeable, leading a long and healthy life, and having a decent standard of living. A healthy workforce is critical to the

\(^{68}\) The Human Development Index (HDI) is a composite statistic of life expectancy, education, and income indices used to rank countries into four tiers of human development. It was developed by Mahbub-ul-Haq and Amartya Sen and was published by the United Nations Development Programme in its first Human Development Report in 1990.
productivity and competitiveness of an economy (World Economic Forum, 2017). Ill workers cannot perform to their full potential and are less productive. Workers with poor health present a cost to the business in terms of low efficiency and high absenteeism. Though the HDI excludes some aspects that contribute to human capability, it however provides a standardized way of quantifying human capability across countries.

**Trade and Capital Account Openness**

Openness of the economy is a very important absorptive capacity factor in a host country. Frankel and Romer (1999) argued that economy openness can facilitate more efficient production of services and goods via moving production to economies that have comparative advantages. Openness of the economy can be measured by trade and financial openness, among other indicators. This study focuses on the two indicators.

Trade openness is an important absorptive capacity factor for a number of reasons. Grossman and Helpman (1990) added that an open trade regime creates favorable climates conducive for investment, learning effects and technological spillovers. They argued that trade promotes diffusion of knowledge largely via the process of imitation of the knowledge capital embedded in the product. Consequently, FDI, financial resources and trade motivate advancing countries to be more innovative and allow developing countries to benefit from the knowledge stock of more advanced countries. Adhikary (2011) added that foreign capital, particularly, FDI can raise the benefits of technological spillovers to the recipient country via expanding the international competition scope and strengthening the abilities to produce and sell services and goods. These effects lead to a fostering of economic growth as demonstrated by Puagel (2007). Adhikary (2011) argued that a more open trade policy framework fosters the allocative efficiency of investment by re-focusing factors of production to sectors that have comparative advantages in trade, thereby supplementing economic growth.

The trade regime in a country may encourage local and foreign enterprises to invest in developing domestic capabilities. According to Mwilima (2003) a highly protected regime or a large regime with very restrictive laws install constraints on the entry and exit of domestic enterprises, discourages upgrading of technology and isolates the economy from important trends in the world.
Many researchers support the view that trade openness and liberalization enhance the efficacy of the disaggregated foreign capital and financial resources in promoting economic growth of the host economies. Liberalizing the trade regime, for example, can encourage and bring competition in the economy and in turn force domestic firms to improve efficiency (Consumer Utility and Trust Society International, 2001). However, the author cautioned that trade barriers should be lifted gradually after liberalisation so as to allow domestic industries in key sectors to achieve a certain level of competitiveness before opening up to competition in the world market. Regional trade agreements enlarge the potential market for investors and therefore act as an investment magnet. This is because small and isolated economies can overcome their demerits in regard to market size by entering into such agreements. These regional initiatives take the forms of free trade areas and customs unions subject to the level of regional integration.

There is empirical evidence that the degree of trade openness determines the growth impact of particularly FDI, ODA, foreign aid and remittances. This is shown by Edwards (1998) who argued that a country with a greater openness degree can absorb the modern technology associated with FDI at a faster rate as opposed to an economy with a lower degree of trade openness. Makki and Somwaru (2004) confirmed that the effect of FDI on growth is dependent on the degree of trade openness. The authors investigated the effect of FDI on growth via trade openness by interacting trade openness with FDI in 63 developing countries during the 1970-2000 period. They found that FDI and trade openness enhance growth. They also found that trade openness and FDI augment each other in increasing economic growth in the host countries.

Further, empirical evidence shows that the foreign capital efficiency in fostering growth can be increased by export promoting strategies and reduced by import-substitution policies. Researchers such as Bhagwati (1978) argued that the effects of foreign capital such as FDI on growth could either be negative or positive subject to the incentives offered by trade strategies of the host economy. Similarly, Balasubramanyam et al. (1996) observed that high inflows of FDI contributed to a positive and faster economic growth in 10 to 18 countries that promoted exports. Moreover, the authors advanced that in countries that promote export, foreign direct investment as opposed to local investment drove economic growth. This result confirms that the effect of FDI on growth of an economy is influenced by the degree of its openness. The Organization for Economic Co-
operation and Development (1998) concurred that the beneficial effect of foreign capital is enhanced by adopting an open trade regime and installing a stable macroeconomic environment.

The growth impact of remittances, ODA and foreign aid can be enhanced by trade openness. Dastidar (2017) also found that remittances promote growth only in more open countries. The author argued that the extent of the benefit is dependent on the domestic institutions and macroeconomic environment in the host country and more open countries have better institutions and better financial markets to exploit advantages of the remittances income and channelize them into profitable investments which, in turn, accelerates the rate of economic growth in host countries. Ali (2012), Feeny and McGillvray (2008), Rahnama et al. (2017), Sakyi (2000) provided empirical evidence that trade openness and liberalization enhance the effectiveness of ODA and foreign aid in host countries.

Capital account liberalization determines of the volume of foreign capital and financial resources flows to host economies and subsequent impact of the same on the domestic economic growth. There is evidence that capital account openness has a positive impact on domestic economic growth. For example, Quinn and Toyoda (2008) tested whether capital account liberalization lead to higher economic growth using de jure measures of capital account and financial current account openness for 94 countries, from 1950 to 2004. Using pooled time-series, cross-sectional OLS and GMM system estimators to examine economic growth rates, they found that capital account liberalization was positively associated with growth in developed and emerging market countries. They also confirmed that liberalization of equity markets has an independent effect on economic growth.

However, the effects of capital account openness on economic growth may differ across countries. Some countries may not possess the constellation of institutions required to fully gain from liberalized capital accounts. Other countries may realize limited improvements in the dawn of capital account openness. Klein (2003) provided evidence of an inverted-U shaped relationship between the responsiveness of economic growth to capital account liberalization and income per capita. The author found that middle-income countries gain significantly from capital account liberalization. However, neither poor nor rich countries showed statistically significant positive
effects. Additionally, the author also found an inverted-U shaped relationship between the responsiveness of growth to capital account openness and various indicators of government quality.

Ito (2005) investigated whether capital account openness leads to financial development after controlling for the level of institutional/legal development, and whether trade opening is a condition for financial opening, in Asia. Using a panel of a sample of 87 developing countries over the period 1980-2000, the author found that a higher level of capital account openness spurs equity market development only if a threshold level of legal development has been attained. Further, trade openness was found to be a condition for stimulating financial development through liberalization of capital account.

Most of the studies analyzing the growth impact of foreign capital through openness of the economy focus on FDI (Balasubramanyam et al. 1998; Makki & Somwaru, 2004), ODA, foreign aid (Ali, 2012; Feeny & McGillvray, 2008; Sakyi, 2010), remittances (Dastidar, 2017) and use trade openness as the measure of absorptive capacity. However, empirical studies on the role of openness of the economy on the effect of short-term foreign capital flows, cross-border bank lending is missing in the literature. This study seeks to close this gap.

Development of Financial Sector

The financial system is central to the proper performance of the economy. According to Gurusamy (2008), financial system is comprised of a set of complex and closely interconnected financial institutions, markets, instruments, services, practices, and transactions. The financial institutions include broadly institutions that take deposits (that accept and manage deposits and make loans and include commercial banks, building societies, credit unions, trust corporations and mortgage loan corporations), contractual institutions (including insurance corporations and pension funds) and investment institutions (including investment banks, underwriters and brokerage companies). Financial system encompasses all financial institutions, borrowers and lenders: a system of institutions including banks and government and international ones.

A financial system is responsible for regulating and facilitating payments and connecting borrowers to lenders and investors with the investment assets. Financial institutions are particularly
responsible for providing service as intermediaries of financial markets. They are responsible for
transferring funds from investors to companies in need of those funds. Financial institutions
facilitate the flow of money through the economy. A financial system is therefore a key tool of
implementing activities of disaggregated foreign capital and financial resources such as
disbursement of investment capital; transfer of financial resources from overseas to recipient
country; provision of education, health and other social infrastructure; payment for material
resources and labour costs; collection of money resources after selling, transfer of income out of
an economy and the other business operations. The success of all such activities requires a well-
developed financial system.

The World Economic Forum (2016) notes that, a financial sector that is efficient allocates the
savings by the citizens of a country and resources that come into the economy from overseas to
their most productive applications. An efficient financial sector directs resources to those
investment projects or entrepreneurial activities with the highest expected rates of return.
Sophisticated financial markets are necessary to avail capital for investment in private sector in
the economy from sources including well-regulated securities exchanges, loans from a sound
banking sector, venture capital and other financial products (World Economic Forum, 2017). In
order to work efficiently, the banking sector requires to be transparent and trustworthy and the
financial markets requires appropriate regulation to safeguard investors and other important actors
in the economy.

Thus, financial development coupled with sophistication is vital in accelerating the absorptive
capacities of the recipient country, facilitate exploitation of the benefits of disaggregated foreign
capital and financial resources more efficiently and realize high economic growth rates. Choong
et al. (2009) found that developed stock markets are a significant mechanism through which FDI,
foreign debt flows and foreign portfolio investment affect economic growth in countries in sub-
Saharan Africa. Their findings revealed that FDI exhibited a positive impact on economic growth,
while foreign portfolio investment and external debt had a significant and negative impact on
growth. The authors argued that the negative impact of the flows of foreign debt and foreign
portfolio investment could be transformed into a positive one if the stock market development had
reached a certain threshold. The threshold is computed by dividing the parameter of the term of
interaction between FDI, foreign debt and portfolio investment and two stock market factors by the coefficient of FDI, foreign debt flows or foreign portfolio investment.

Utilizing cross-country panel data for some two samples, one of 49 countries and another one of 71 countries, over 1975-1995 period, Alfaro et al. (2004) used various indicators of financial development and established that FDI positively contributes to growth, and those countries with financial markets that are well-developed witnessed significant benefits from FDI. The authors proved that existence of a well-developed financial system enables economies to exploit foreign capital more efficiently. In turn, Hermes and Lensink (2003) argued that the development and sophistication of the financial system and markets of host economy forms a critical prerequisite for disaggregated foreign capital and financial resources to impact positively on economic growth. The authors provided some explanations on the role of development of financial sector in harnessing FDI efficiently to foster growth in the host economy. They posit that financial institutions aid in reduction of the investment risks connected to upgrading or adopting modern technologies. Hence, the technological innovation speed is determined by this local upgrading and adopting of modern technology.

Financial systems also influence partly the capability of domestic corporations to finance their plans of investment even where foreign funding is needed. The local financial system partly influences the capability of foreign firms to borrow to extend their innovation activities in the host country, thus expanding the scope for technological spillovers to local corporations. Consequently, the quality of financial system may determine the FDI impact on the diffusion of technology in the host nation. The diffusion of technology is believed to be more efficient in host economies endowed with a better financial system. Durham (2004) examined institutions and financial development as absorptive capacity that determine the degree of technology spillovers. Ang (2008) reported similar results for Thailand while Krogstrup and Matar (2005) observed that Arab countries with poorly developed financial systems failed to benefit from FDI. A developed local financial system and markets therefore positively contributes to the technological diffusion process linked with especially FDI.
Besides investigating the effect of development of financial sector on the impact of foreign capital on economic growth of the host country, empirical studies have also established that a certain threshold of financial development must be attained for a recipient country to benefit from foreign capital. One such study was conducted by Sadik and Bolbol (2003). Using panel data for Arab countries over 1975-2000 period, Sadik and Bolbol (2003) found that a certain minimum threshold of financial market development must be attained to gain from FDI.

The majority of the empirical studies are either carried out in regions outside the COMESA region or included a few of the countries in the COMESA region. For example, Ndoricimpa (2009) found that Burundi, Egypt, Ethiopia, Kenya, Libya, Madagascar, Mauritius, Seychelles and Zimbabwe benefited most from the growth impacts of FDI because they had the most developed financial sectors.

Agbloyor et al. (2014) contented that presence of strong domestic financial markets enhance the growth impact of FDI and other private capital flows in Africa. They argued that countries with strong domestic financial markets are able to transform the negative impact private capital into a positive one. The results were robust to the control of financial openness. Dastidar (2017) concluded that more open countries have better financial markets to take advantage of the remittances income and put them into profitable investments to accelerate economic growth rate in host countries. Gadzar and Kratou (2017) found that remittances promote growth in countries with developed financial systems, suggesting that for remittances to contribute to economic growth, African countries must possess a developed financial system.

Although there are the many empirical studies on the growth impact of foreign capital and financial resources through financial sector/system development, most of them have mainly focused on FDI (Agbloyor et al., 2014; Ndoricimpa, 2009) and remittances (Dastidar, 2017; Gadzar & Kratou, 2017). In addition, the literature on the nexus of foreign capital-growth seems to have ignored the important role played by development of financial sector on the growth effect of disaggregated foreign capital and financial resources including FDI, short-term foreign capital flows, cross-border bank lending, remittances, ODA and aid. Financial sector development is very important as lack of financial markets hamper investors from accessing the financial resources required
(Massoud, 2008). This study extends the analysis to include short-term foreign capital flows, cross-border bank lending, remittances, ODA and aid.

Studies in this field are faced with the challenge of lack of a single measure of financial sector development. The literature however identifies a number of proxies to measure this variable. One of the measures used in empirical studies is the existence of a large size and well-functioning financial market (Alfaro et al., 2004; Choong et al., 2009; Durham, 2004). Durham (2004) used the ratio of stock market capitalization to GDP and bank credit to GDP ratio to proxy for the financial development in their study. Other authors such as Choong et al. (2009) used market capitalization of the companies listed in the stocks and securities exchanges to the GDP ratio and the total stock value traded to the GDP ratio to measure the financial development. Similarly, Alfaro et al. (2004) used the stock market liquidity to capture the value of stock trading relative to the economy size and the mean value of listed domestic shares on local exchanges in a year as a share of the size of the economy (the GDP) so as to approximate the relative size of the stock market. The authors also modelled the liquidity in the market by using the relative share of broad money in the economy or the share of M2 in GDP. Thus, broad money (M2) as a share of GDP is another key measure of financial deepening and development. This ratio approximates the degree of monetization in the economy as well as the depth of the financial sector while it also shows an expansion of payment and saving functions. The other measure used by other researchers is the ratio of bank deposit liabilities to GDP (Durham, 2004). This proxy indicates the ability of the banking sector to allocate funds between savers and firms. Another ratio that can be employed in an empirical study is domestic credit to GDP, which reflects the extent to which financial intermediaries allocate savings and firms’ utilization of credit in addition to internal financial resources. The last measure is the share of private sector credit to size of the economy or GDP. All these measures of financial absorptive capacity give similar results in the models used in the studies reviewed.

The data on stock markets in the COMESA region is not available as the markets are not well developed in most of the economies. Following Durham (2003) and Shahbaz, Leitão and Malik (2011) who used bank credit and access to credit to private sector in their studies, respectively, this study uses access to credit by private sector to proxy the financial sector development. The
choice is based on the understanding that commercial financial intermediaries are able to identify profitable investments, monitor managers, manage risks and mobilize savings. The variable is found relevant to this study as it has been used in other similar studies (Durham, 2003; Shahbaz et al., 2011) and data on the variable is also readily available for the period under study. Improvement of access to credit to the private sector provides financial resources for private sector development. It is argued that growth in private sector in turn results in higher GDP per capita growth for the host countries. It is therefore expected that financial sector development in terms of improvement in access to credit to private sector lead to higher GDP growth rates in the COMESA region.

**Development of Quality Institutions**

According to Nelson and Sampat (2001) institutions are arrangements between people to facilitate cooperative activity. Institutions do not exclude the moral, ethical and behavioral norms of a community. Other researchers such as Kalotay (2000) sees institutions as policies that are supportive to investment and accompanying frameworks of administration, while Durham (2004) uses the business regulation, the property rights protection and corruption as important institutional measures. Nelson and Sampat (2001) added that institutions provide rules that facilitate human interaction leading into greater predictability and less uncertainty and discouraging actions that are economically expensive.

The World Economic Forum (2017) believes that the environment of the institutions is influenced by the administrative and legal framework within which individual persons, corporations and governments interact so as to produce wealth. The role of institutions goes beyond the legal framework. According to de Soto & Abbot (2002) attitudes of the government toward freedoms and markets as well as the efficiency of governments’ operations are crucial: excessive red tape and bureaucracy, prevalence of corruption, overregulation, dishonesty in public contracts, inability to supply appropriate services for the business sector, lack of trustworthiness and transparency, and political dependence of the judicial system lead to significant economic costs to businesses and slow the process of developing the economy.

Although a development of quality institutions is important for enhancing the growth impact of foreign capital, several empirical studies do not analyze the effect of institution quality in
determining domestic growth. Some of the empirical studies that investigate the growth impact of FDI and ignore the important role played by the quality of institutions in influencing efficiency of investment and growth, include, among others, Alfaro et al. (2004), Balasubramanyam et al. (1996), Borensztein et al. (1998), Carkovic and Levine (2002) and Li and Liu (2005).

However, several other empiricists including Acemoglu et al. (2015), Easterly and Levine (1997), Rodrik et al. (2002), Sala-i-Martín and Subramanian (2003), among others, argued that the quality of institutions influence the competitiveness and economic growth of a country. High quality of institutions influence decisions of investment and the production organization and the ways in which societies distribute the gains and shoulder the costs of policies and strategies of development. For instance, de Soto (2000) argued that owners of corporate shares, land and intellectual property are not willing to invest in the upkeep and improvement of their ownership property are unprotected.

There is evidence that quality of institutions influence the effects of foreign capital and financial resources on the growth in host economies. For instance, Catrinescu et al. (2009) found that remittances promote long-term economic growth when the economic and political policies and institutions of the receiving economies generate incentives for investment, encouraging savings and growth in business from the remittances.

Similarly, Gadzar and Kratou (2017) employed the GMM-system method of estimation to investigate the effect of remittances on economic growth in a panel of 24 African countries over the period of 1988-2011. The authors found that remittances are more effective in enhancing growth in countries with strong institutional environment. Dastidar (2017) argued that the growth impact of remittances is dependent on the domestic institutions and macroeconomic environment in the host country. The author examined the empirical relationship between remittances and economic growth for a sample of 62 developing countries over the period 1990-2014 and found that more open countries have better institutions take advantage of the remittances income, put it into profitable investments and accelerate the rate of economic growth. Using IV-GMM estimator, Agbloyor et al. (2014) investigated the relation between growth, FDI and other private capital
flows in Africa during the period 1990-2007 found that private capital flows promote economic growth in the presence of high institutional quality.

Oloffsdotter (1998) found that FDI had a statistically significant positive effect on economic growth and that the impact was stronger for host countries with a higher institutional capability as measured by the degree of protection of property rights and efficiency of bureaucracy. While analysing the determinants of FDI, institutional development included, Durham (2004) defined the institutional development as policies that are friendly and conducive to investment and frameworks of administration represented by the business regulation, property rights protection and strict control of corruption. Durham (2004) investigated the effect of institution quality (as measured by the indices of property rights and business regulation) in determining the impact of FDI on growth for 80 countries during 1979-1998 period. The author found that business regulation and property rights protection boosts the growth impact of FDI. Further, the author established that the host country that reaches a minimum threshold of quality of institutions realizes a positive growth impact from FDI. Durham (2004) argued that the institutional development promotes productivity by potentially facilitating the flow of imported capital to productive enterprises. Moreover, Ayal and Karras (1998) examined the effect of quality of institution measured by components of economic freedom index on growth in 58 countries over the 1975-1990 period. The authors found that economic freedom index has a positive impact on economic growth. Ayal and Karras (1998) also pointed out that reports on economic freedom showed that economic growth rose with reduction in direct involvement of government in economic activities. The reports attribute the rise in growth following reduced government involvement in economic activities to economic policies of privatization and changes in laws that make the particular countries conducive to investment. Other studies by Acemoglu et al. (2015), Hall and Jones (1999), Krogstrup and Matar (2005) and Rodrik et al. (2002) also found that high institutional quality is a critical precondition for economic growth. Burnside and Dollar (2000) provided evidence that high quality institutions enhance the effectiveness of foreign aid.

Despite existence of several empirical studies on the growth effect of foreign capital and financial resources, most of the empirical studies have mainly focused on FDI, remittances, ODA and foreign aid. Additionally, the literature on the foreign capital-growth nexus have excluded role
played by development of quality institutions on the growth impact of either short-term foreign capital flows, cross-border bank lending, ODA or aid. This study extends the analysis to include them.

There are however few sources of information on the institutional quality measures. Several researchers who analysed the effect of regulations and institutions across several countries relied on a few sources of the institutional quality indicators. These sources include the indicators on political risk provided by the Political Risk Services (PRS) Group69 (2018) in their International Country Risk Guide (ICRG) or the government effectiveness indicators obtained from the annual Global Competitiveness Report produced by the World Economic Forum (2017). These bodies publish a large variety of crucial indicators, for example, on the level of corruption or the quality of the bureaucracy, which have proven to be relevant for the effects of government regulations and institutions. These indicators, are however constructed from the results of executive opinion surveys and thus, presents the perceived level of the rule of law or corruption. Predominantly, they do not use factual information to capture differences in regulations and institutions across economies.

In 2004, the World Bank commenced publishing results from their Doing Business project (World Bank, 2004). Through its indicators Doing Business measures and tracks changes in the regulations applying to domestic small and medium-size companies, operating in the largest business city of each economy, in eleven areas in their life cycle: starting a business, handling construction permits, employing workers, registering property, getting electricity, protecting investors, getting credit, paying taxes, enforcing contracts, trading across borders and resolving insolvency (World Bank, 2014b). The database of Doing Business offers objective measures of business regulations and their enforcement. The indicators are also comparable across several countries and indicate the business regulatory costs. They also allow for obtaining information on regulatory outcomes, such as time and money spent on bureaucratic procedures and consequently offer opportunities to

69Established in 1979, The PRS Group is among the earliest commercial providers of political and country risk forecasts. Originally the Political Risk Services division of Frost & Sullivan, Inc. and then of UK-based IBC Group (now known as Informa), the firm occupies a niche market in the risk sector through the application of two proprietary, quant-driven, and back-tested methodologies: Political Risk Services (PRS) and the International Country Risk Guide (ICRG). A number of products based on these two risk rating systems are produced at regular intervals throughout the year.
analyse the efficiency of the institutions installed by the government. By zeroing in on evidence for regulations, one obtains more objective indicators that are less determined by recent events or phases of economic development. These indicators, can then be utilized to investigate specific regulations that promote or hinder growth, productivity and investment.

There are many measures of institutional quality researchers can choose from. The most important are property and contract rights. This is because the two indicators are very critical in boosting economic growth, especially through technological progress. According to Keefer and Shirley (2000), the empirical evidence is compelling that secure property and contract rights are vital for growth. It is argued that the foreign investors consider future profits and the right of utilizing the profits while doing business in a host country. Protection of property rights by the law implies security for foreign investments from nationalization or confiscation by administrative means, leading into expansion and development of the foreign investment. This could yield extra benefits to the host economy. On the other hand, insecure property rights and regulations that are not stable may influence the investors to relocate their investment to other countries.

In the empirical growth literature, property and contract rights are often measured by indicators such as the expropriation risk and repudiation of contracts by government, corruption in government, rule of law and quality of bureaucracy. Researchers such as Acemoglu et al. (2001) used settler mortality rates in former colonial times as an instrument for expropriation risk.

The security of property and contract rights is also represented in a country’s governance structure, policy and practices. The World Bank has identified over 300 indicators of various aspects of governance\(^\text{70}\). These indicators are classified under six main categories, namely: political stability/lack of violence, voice and accountability, regulatory framework, rule of law, government effectiveness, and corruption and graft (Kaufman et al., 1999). The indices have been constructed so that estimates of governance in the global database have a standard deviation of one and a mean of zero. A higher number signifies a better score. This study uses variables of voice and accountability, political stability, government effectiveness, regulation, rule of law and control of

\(^{70}\text{See www.worldbank.org/wbi/governance/wphtm#governance}\)
corruption so as to represent the quality of institutions in the COMESA region. This is because these indicators of quality of institutions are clearly applicable for testing the correlation of the foreign capital and financial resources with the GDP per capita in the COMESA. These indicators have also been used in previous studies by among others Acemoglu et al., (2001), de Soto and Abbot (2002) and Durham, (2003). Finally, data for these variables is also available for the period of study.

**Development of High Quality Infrastructure**

Infrastructure comprises both physical and soft infrastructure. According to O’Fallon (2005) physical infrastructure is deemed as a system of service associated with supply of clean energy, water, telecommunications, transport, sanitation and waste facilities, as well as drainage and flood protection systems. Transportation infrastructure includes railways, roads, airlines, airways, water ways, vehicles and ship used to move people, goods and raw material from one location to another. Thus, bad physical infrastructure system can raise costs of doing business and waste time, translating into less profit to foreign and domestic investors. Soft infrastructure on the other hand, includes internet, telephone, and digital communications through which most information and communication go through. Efficient soft infrastructure systems such as broad, speedy and stable internet improve business communications and smoothen operations.

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 disaggregated foreign capital and financial resources, to produce growth effects in a host economy (Tondl & 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.

Many empirical studies of economic growth including Barro and Sala-I-Martin (1995), Munnell (1992) and Sanchez-Robles (1998) see 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. Alternatively, investment in
infrastructure allows local and foreign corporations to produce their services and goods at a lower total cost. Consequently, a recipient country may gain from financial resources and FDI only if it develops efficient infrastructure. Researchers such as Kinishita and Lu (2006) and Yamin and Sinkovics (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) analyzed the impact of FDI on growth when a host economy has a sufficient level of infrastructure development for 42 non-OECD countries. Using ordinary least squares (OLS) regressions and random effects general least squares (GLS) estimates, the authors based their estimations on panel data set with data averaged over each of the six 5-year periods during 1970-2000 period. They 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 short-term foreign capital flows, cross-border bank lending, ODA, aid and remittances is missing in the literature. This study seeks to close this gap.

A good overall infrastructure complement for foreign capital. If disaggregated foreign capital and financial resources meet poor transport and telecommunication system and unreliable electricity supply, they may not generate a significant impact on productivity. In contrast, development of quality infrastructure such as institutions of education, roads, sea ports, airports and research and development collaborations support potential spillovers in a significant manner.

Adequacy of infrastructure is important for converting the benefits of foreign capital into beneficial spillovers in the host economy. The Organization for Economic Co-operation and Development (2002) pointed out that inadequacies in infrastructure is a main bottleneck to entrepreneurial activity, while a well-developed communication and information technology systems result into a greater economic growth.

The World Economic Forum (2017) 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. Development of high quality infrastructure decreases the effect of geographical distance between regions and integrate the
domestic to foreign markets at a low cost. Aschauer (1989) added that the extensiveness and quality of networks of infrastructure have a significant positive impact on economic growth and reduce poverty and income inequalities. The World Economic Forum (2017) pointed out that a well-developed communications and transport infrastructure network is key for easing access to critical economic activities and services by the less-developed communities in a country.

Infrastructure plays a vital role in supporting foreign capital activities. 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 & Bamou, 2007), public investment to GDP ratio (Barro, 1990; Mwega & 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. It is better and 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 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 high level of productivity of a country and sets a high prosperity level that can be achieved by an economy.
Technology, Research and Development

Technology is a broad concept referring to equipment and knowledge which satisfies human needs and wants (UNESCO Technology Guide). According to Keller (1995), as technology can transfer from more developed to less developed economies, advanced technology is a major benefit expected by a host country from foreign capital, particularly FDI. However, the transfer of the benefit is mainly dependent on the technological capacity of the host nation. The gap of technology between the foreign and host country of net foreign capital inflows determines the host country absorptive capacity. Researchers such as De Mello (1997) argued that large technological gap leads to small impact of FDI on economic growth.

Research and development (R&D), defined as the ability of the firm to exploit foreign knowledge, is a critical factor of absorptive capacity (Cohen & Levithal, 1990). Literature has identified both country and firm levels of technology and research and development. This is because, in many developing countries, COMESA included, the new technology and research and development are mainly developed by institutions in a country, including universities, government-owned corporations and some private corporations. Regarding national level of technology, Borensztein et al. (1998) established that FDI contributes to growth only when a host nation avails a sufficient absorptive capacity of advanced technologies. FDI leads to higher efficiency when more modern technology and advanced management skills are combined. This finding concurred with De Mello (1997) who argued that the larger the gap of technology between the host nation and the home country, the smaller the expected growth impact of FDI is. The author added that host economies call for FDI so as to use the FDI advanced technology to grow their economies. However, this requires the host country to have an initial development in technology so as to assimilate this benefit. According to the United Nations Economic and Social Commission for Asia and the Pacific (1984) the absorptive capacity of technology of a recipient economy has a significant impact on the effectiveness of transfer of technology. As regards the firm-level technology, Kokko et al. (1996) advanced that local firms can gain only if the gap of technology is small so that local firms can absorb the knowledge available from the foreign multinational companies. Other researchers such as Usui (1983) cautioned that technology transfer is effective only if the host
firms already possess an adequate capacity to absorb the acquired technology without recourse to a wide array of services from the foreign affiliates.

The research and development level of the host country is a component of innovation and therefore considered one of the major factors of absorptive capacity for foreign capital. It is indeed argued that, once a high stock of research and development of the host economy is developed, the assimilation of advanced technology of foreign capital into the host country becomes less difficult. Researchers such as Fu (2008) observed that the globalization of research and development accord a chance for developing countries to catch up on the frontier of technology of the developed world. In addition, Cohen and Levithal (1990) argued that the ability of a firm to exploit foreign knowledge and innovations is often produced as a by-product of its research and development, which in turn produces new knowledge and contributes to the absorptive capacity of the firm. It is argued that an advanced technological level enhances the absorption of spillovers of foreign capital in host economies.

An important dimension of technological progress that determines the growth impact of disaggregated foreign capital and financial resources is technology gap between the host and home nations. UNCTAD (2006) defines the technology gap between nations as the variations between those nations which have access to technology and employ it effectively and others who do not. Thus, the technology gap exists between nations that can innovate and create to come up with modern technologies and those who cannot. Castellani and Zanfei (2005) pointed out that higher technology gaps can raise the possibility that foreign corporations tend to crowd out local competitors and suppliers. Consequently, the authors proposed that the positive effect of FDI on the domestic investment productivity is dependent on the size of technological gaps between domestic and foreign corporations.

Economic theory posits that research and development and technology gap are key determinants of the growth effects of FDI and financial resources in the host countries. Barro and Sala-I-Martin (1997) advanced that the long-run growth rate is dependent on the innovation of technologies or new products in a small number of leading countries. Even though the imitation of technology is typically cheaper compared to invention, many countries do not prefer to invent but rather copy.
This means that follower nations located in less developed and developing world, will grow relatively faster and catch-up with the leader countries. In such a case, the growth impact of a disaggregated foreign capital and financial resources is expected to be larger for a larger technological gap between host and home countries. However, where developing economies are in general lagged behind in terms of development of technology, FDI in particular, would be the key channel of spurring growth in the least developed countries (Colen et al., 2008).

Grossman and Helpman (1994) reported that the economic growth of the technological leader has been rising over time, which takes place in the neoclassical model. The authors also observed that the countries do not converge to a common level of income per capita, as expected in the neoclassical model if they share similar technologies and saving behavior. Additionally, Fagerberg (1994) demonstrated that the variations in technology between countries are as result of the outcome of the differences in GDP per capita growth across countries. Further, the author added that a large part of the differences in the actual economic growth rates between countries of the OECD could be accounted for by the magnitude of the technology gaps.

UNCTAD (2006) proposed that the technology gap between developing and developed economies must be bridged, so as to produce a sustainable development for the developing economies and enable them to compete effectively in a global economy. In particular, the report established that the differences in the knowledge stock generates about 60 percent of the variations in the levels of income between countries in sub-Saharan Africa and the industrialized world. Colen et al. (2008) demonstrated that the catch-up rate is dependent on the human capital stock in the developing countries, and therefore, on the capability to absorb the positive FDI spillovers. The growth impact of FDI is dependent on the technology gap between the host and home countries and a large technology gap slow down the technological and knowledge spillovers.

The technology gap is an important absorptive capacity of the host country used in many empirical studies to investigate the impact of disaggregated foreign capital and financial resources on the growth of host countries. The studies include Blomstrom et al. (1992), Kokko (1994), Li and Liu (2005) and Qun-yang, Qin and Yan (2006). Kokko (1994) used the technology gap between domestic and foreign corporations as a measure of absorptive capacity in 216 manufacturing
industries in Mexico. The author found that domestic firms can gain from the diffusion of technology from foreign firms if the technology gap between them is not big. Qun-yang, Qin and Yan (2006) used industrial data to analyze the effect of FDI technology spillovers in Zhejiang province in eastern China. The authors identified the major mechanisms of Zhejiang provincial technical spillover effects as the competition, technology gap, linkage of industry and concentration of industry.

Blomstrom et al. (1992) examined the growth impact of FDI via the technology gap of the host nation by dividing their sample of developing countries into low income and high income sub groups. The authors found that FDI was growth stimulating in the second group sample of high income countries. However, the authors did not proceed to establish the exact technology gap threshold.

In turn, Li and Liu (2005) analyzed the role played by the technology gap in the host economy so as to obtain the growth effect of FDI. The authors included the proxy of technology gap in their growth regression. Additionally, they applied both random effect and simultaneous system on a panel data for 84 countries during 1970-1999 period to investigate the effect of FDI on growth. They found a significantly negative parameter estimate for this proxy, which means that the lower the technological development level of the host nation, the less is the impact of FDI on growth. Their results imply a threshold value for the technology gap must reach, above which FDI is no longer beneficial for the host country.

Majority of the foregoing studies have been carried out in regions other than COMESA. A study by Ndoricimpa (2009) used annual data for a panel of sixteen COMESA countries\(^1\) and found that FDI had a strong positive impact on countries with high technology gaps including Burundi, Comoros, Egypt, Ethiopia, Kenya, Libya, Mauritius, Madagascar, Malawi, Seychelles, Sudan, Uganda, Zambia and Zimbabwe. The findings further suggested that Egypt, Libya, Mauritius and Seychelles benefited most from FDI as they had low technology gaps.

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\(^1\)The sixteen countries in the COMESA region include Burundi, Comoros, DRC, Egypt, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Seychelles, Sudan, Swaziland, Uganda, Zambia and Zimbabwe.
It is clear that there are many empirical studies on the growth impact of disaggregated foreign capital and financial resources. However, the literature on the foreign capital, financial resources-growth nexus has excluded the role of technology gap on the growth effect of short-term foreign capital flows, cross-border bank lending, remittances, ODA and aid. Most of the empirical studies have focused on FDI.

3.1.7 Overview of the Literature

The growth impact of the FDI and different components of financial resources and the effect of absorptive capacity on this impact are analyzed in the context of the neoclassical and endogenous growth theories. According to the neoclassical growth theory, disaggregated foreign capital and financial resources contribute to economic growth through accumulation of capital by introducing new products and exotic technology. However, the diminishing returns of physical capital limits economic growth to the short term only. To achieve growth in both the short term and long run, endogenous growth theorists argue that disaggregated foreign capital and financial resources augments the stock of knowledge in the host economy by knowledge transfer. Foreign capital facilitates the use of local raw materials, introduces modern management practices and brings-in new technologies. The financial resources provide funds for investment and acquisition of new technological products.

The overview of the empirical literature is divided into clusters along research gaps. The empirical literature review has shown that some studies examine the impact of several foreign capital inflows on the economic growth of recipient economies. They include studies by Reisen and Soto (2001), Durham (2003), Macias and Massa (2009), Choong et al. (2009) and Gheeraert and Mansour (2005). For example, Reisen and Soto (2001) analysed the independent effects of economic growth of bond and portfolio equity flows, FDI, short-term and long-term bank lending and other official flows and on 44 developing countries. Using a sample of 88 countries from 1977 to 2000, Durham (2003) analysed the growth impact of bond foreign portfolio investment, total foreign portfolio investment and other foreign investment, including cross-border bank lending. However, the author excluded FDI, overseas development assistance and official aid and remittances from the analysis.
A study by Macias and Massa (2009) investigated the impact of cross-border bank lending, FDI, bonds flows and portfolio equity on economic growth on a sample of selected sub-Saharan African countries but excluded the financial resources such as overseas development assistance and official aid and remittances in their analysis despite their expected positive contribution to growth and development in host countries.

Other researchers such as Choong et al. (2009) analysed the impact of FDI, foreign debt flows and foreign portfolio investment, while Gheeraert and Mansour (2005) investigated the relationship between economic growth and FDI, investment in equity, investment in debt and financial derivatives flows. However, Choong et al. (2009) and Gheeraert and Mansour (2005) excluded cross-border bank lending, overseas development assistance and official aid and remittances in their analysis. In addition, most of the empirical studies reviewed do not cover all the countries in the COMESA region. To the best of our knowledge, no studies have been carried out to investigate the relationship between GDP growth and FDI, short term foreign capital flows, cross-border lending, remittances, ODA and aid using data drawn from all the countries in the COMESA region. Thus, the link between GDP growth, disaggregated foreign capital and financial resources in the COMESA region is not clear and well supported by empirical evidence. This study fills that literature gap.

The empirical evidence also shows that the impact of foreign capital and financial resources on the GDP growth of the recipient nations is conflicting: with some studies establishing positive, negative or indeterminate impact. Some of the empirical studies that have shown that the growth impact of FDI, ODA, aid, remittances, cross-border bank lending and short term foreign capital flows is positive and statistically significant include Agbloyor et al. (2014), Blomström et al. (1994), Gheeraert and Mansour (2005), Gomanne et al. (2002) and Macias and Massa (2009), Meyer and Shera (2017), Rahnama et al. (2017), among others. Other researchers such as Agbloyor et al. (2016), Doucouliagos and Paldma (2009), Levine and Carkovic (2002) and Spatafora (2005) have shown that aid, FDI and remittances has no impact on the GDP growth in the host economies. Still, other empirical studies by researchers such as Burnside and Dollar (2000), Chami et al. (2005), Choong et al. (2009) and Durham (2003) show that various foreign capital, including foreign aid, remittances and cross-border bank lending, have a negative growth impact in the
recipient economies. Due to lack of empirical studies carried out in the COMESA region, the growth impact of foreign capital and financial resources in the region is unclear and unsupported. This study seeks to clarify the significance and direction of the said impact in the region.

The literature emphasizes the importance of absorptive capacity when determining the ability of a host economy to benefit from foreign capital. It is argued that foreign capital produces positive effects on economic growth only when the absorptive capacity factors of host economies, sectors and firms are sufficient. Empirical literature has identified absorptive capacity factors as well-developed human capital (Blomstrom et al., 1994; Borenstein et al., 1998; Li & Liu, 2005), highly developed financial sector (Agbloyor et al., 2014; Alfaro, et al. 2004; Choong et al., 2009; Durham, 2004; Shahbaz et al., 2011), high level of technology, research and development (Barro & Sala-i-Martin, 1995; de Mello, 1997), improved trade openness, export-oriented trade policy and capital account openness (Balasupramanyan et al., 1999; Ito, 2005; Rahnama et al., 2017; Quinn & Toyoda, 2008), quality development public infrastructure (Ashauer, 1989; Tondl & Prüfer, 2007) and improved quality of institutions such as legal development, corruption control, protection of property rights, (Agbloyor et al., 2014; Catrinescu et al., 2009), and sound macroeconomic policies. The results of the absorptive capacity factors give almost similar results in the models used in the studies reviewed: positive and statistically significant or not statistically significant coefficients. Most of previous empirical studies did not cover all the countries of the COMESA region, analyzed one or few absorptive capacity factors and none of the studies are carried out using data drawn from the region. This study closes this literature gap.

The study explores human capital development, trade and capital account openness, financial sector development, quality of institutions, technology gap, and quality of infrastructure as key absorptive capacity factors influencing the ability of the COMESA region to absorb and benefit from spillovers of foreign capital and financial resources and promote GDP growth. Data on these variables is also readily available for the period under study. In addition, the absorptive capacity factors should reach a certain threshold in order for foreign capital and financial resources to have a positive impact on the GDP growth of the recipient economy. This study determines the certain threshold reached by some or all absorptive capacity factors chosen in order for the foreign capital
and financial resources to have positive impact on the GDP growth in the COMESA region. The absorptive capacity also defines the quality of FDI and financial resources in the region.

3.2 Methodology

This section presents the methodology employed in chapter three. It is divided into four areas. It begins by presenting a theoretical framework which outlines the theoretical basis of the analytical concepts and models used in the study. The empirical model estimated in the study is then specified. Finally, this section explains the variables used in the study. The data types and sources used in the study are presented in table 2.2 in the previous chapter two.

3.2.1 Theoretical Framework

A theoretical growth model founded on the Cobb-Douglas production is developed to examine the impact of disaggregated foreign capital and financial resources on the GDP growth of the COMESA countries. It is expressed as follows:

\[ Y_{i,t} = A_{i,t} L_{i,t}^\alpha K_{Di,t}^\beta K_{Fi,t}^\theta \]  \hspace{1cm} 3.1

where Y represents the flow of output, A is the total factor productivity, \( K_D \) represents the domestic capital, \( K_F \) represents the disaggregated foreign capital and financial resources, \( L \) is the labor force, \( \alpha \) represents the output changes to labor force changes, \( \beta \) represents the output changes to domestic capital, while \( \theta \) represents the changes in output to changes in stocks of disaggregated foreign capital and financial resources. \( \alpha \), \( \beta \) and \( \theta \) are assumed to be less than one, implying 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.

A dynamic production function, expressed as shown in equation 3.2, is produced by taking the logarithms of equation 3.1:

\[ lnY_{i,t} = \tau + \alpha lnL_{i,t} + \beta lnK_{Di,t} + \theta lnK_{Fi,t} + \epsilon_{i,t} \]  \hspace{1cm} 3.2
Equation 3.2 is expanded by including other factors that explain GDP per capita growth, denoted by \( W \), absorptive capacity factors, denoted by \( Z \), and interaction terms between absorptive capacity factors and disaggregated foreign capital and financial resources, \( Z^*K_F \). The addition of the interaction terms follows Choong et al. (2009), Catrinescu et al. (2009), Durham (2003) and Elboiashi (2011), among others.

\[
\ln Y_{i,t} = \tau + \alpha \ln L_{i,t} + \beta \ln K_{D,i,t} + \theta \ln K_{F,i,t} + \gamma \ln W_{i,t} + \lambda \ln Z_{i,t} + \pi (\ln Z^*K_F)_{i,t} + e_t + \upsilon_i + \epsilon_{i,t} \ldots \ldots \ldots \ldots \ldots \ldots \ldots 3.3
\]

where \( \ln \) is the natural logarithm, \( Y \) stands for the real GDP per capita; \( L \) represents the labour force; \( K_D \) represent the domestic investment; \( K_F \) represent disaggregated foreign capital and financial resources; \( W \) is a set of other factors that explain economic growth; \( Z \) is the absorptive capacity factors; \( (Z^*K_F) \) is the interaction terms between the factors of absorptive capacity and various components of the foreign capital and financial resources; \( \tau \) is a constant; \( e_t \) time-specific effects which are also assumed to be independently and identically distributed over all time periods; \( \upsilon_i \) represents unobserved country-specific effects which are independently and identically distributed over all the countries, \( \epsilon_{i,t} \) is a normally distributed error term; and \( \alpha, \beta, \theta, \gamma, \lambda \) and \( \pi \) are the parameters to be estimated.

The incorporation of dynamics into equation 3.3 requires that the equation be rewritten as an AR(1) model by including the past values of GDP per capita as an independent variable. This operation produces equation 3.4:

\[
\ln Y_{i,t} = \tau + \delta_0 \ln Y_{i,t-1} + \alpha \ln L_{i,t} + \beta \ln K_{D,i,t} + \theta \ln K_{F,i,t} + \gamma \ln W_{i,t} + \lambda \ln Z_{i,t} + \pi (\ln Z^*K_F)_{i,t} + e_t + \upsilon_i + \epsilon_{i,t} \ldots \ldots \ldots \ldots \ldots \ldots \ldots 3.4
\]

where \( \delta_0 \) is the parameter for the difference of lagged values of GDP per capita. The rest of the terms are as explained in equation 3.3.

Following standard economic theory, it is expected that \( \alpha, \beta, \theta, \gamma, \lambda \) and \( \pi \) are either negative or positive, subject to the impact of the variables on GDP per capita growth. If \( \theta \) is positive and \( \pi \) is negative, the suitable threshold would be the value of the absorptive capacity measure \( Z \) that

---

\(^72^\) The other factors that influence GDP per capita growth include among others Openness of the economy, public debt and inflation.
makes the impact of disaggregated foreign capital and financial resources on the GDP per capita growth positive. In this case, the precise threshold or break-even point (BEP) is given as follows:

\[ \text{BEP} \geq - \frac{\theta}{\pi} \]

On the other hand, if both \( \theta \) and \( \pi \) are positive (negative), then disaggregated foreign capital and financial resources have an obvious positive (negative) real effect. The concept of break-even point is important as it determines the threshold of absorptive capacity factors required to ensure that disaggregated foreign capital and financial resources has a positive impact on the per capita GDP in the host economies, in this case, the COMESA region.

### 3.2.2 Empirical Model

Our empirical specification takes the form in equation 3.6:

\[
\ln \text{GDPPC}_{i,t} = \tau + \gamma_0 \ln \text{GDPPC}_{i,0} + \gamma_1 \ln \text{GDPPC}_{i,t-1} + \gamma_2 \ln \text{HUMCAP}_{i,t} + \gamma_3 \ln \text{DINV}_{i,t} + \gamma_4 \ln \text{OPEN}_{i,t} + \gamma_5 \ln \text{PUBDEBT}_{i,t} + \gamma_6 \ln \text{INFLA}_{i,t} + \gamma_7 \ln \text{DFCFR}_{i,t} + \gamma_8 \ln \text{Abscap}_{i,t} + \gamma_9 (\text{DFCFR*Abscap})_{i,t} + e_t + u_i + \nu_{it}
\]

where \( \ln \) symbolizes natural logarithm, \( \ln \text{GDPPC}_{i,0} \) is the natural logarithm of the initial GDP per capita; \( \ln \text{GDPPC}_{i,t} \) is the natural logarithm of the per capita GDP in country \( i \) during period \( t \); \( \ln \text{GDPPC}_{i,t-1} \) is the natural logarithm of the lagged GDP per capita; \( \text{HUMCAP} \) is the human capital stock; \( \ln \text{DINV} \) is the natural logarithm of the domestic investment; \( \ln \text{OPEN} \) is the natural logarithm of trade or capital account openness; \( \ln \text{PUBDEBT} \) is the public debt; \( \text{INFLA} \) is the changes in annual general level of prices, represented by consumer price index (CPI); \( \ln \text{DFCFR} \) stands for either \( \ln \text{FDI} \) (represents the natural logarithm of FDI), \( \ln \text{STFCF} \) (the natural logarithm of the short-term foreign capital flows), \( \ln \text{LOANS} \) (the natural logarithm of the cross-border bank lending), \( \ln \text{ODAAID} \) (represents the natural logarithm of the overseas development assistance and official aid), and \( \ln \text{REMIT} \) (representing the natural logarithm of the remittances received from abroad); \( \ln \text{Abscap} \) are the natural logarithms of the set of chosen absorptive capacity factors that influence the ability of the COMESA region to absorb and benefit from spillovers of the disaggregated foreign capital and financial resources, including the stock human capital development, trade openness, current account openness, development of quality infrastructure, technology gap,
financial sector development and institutional quality (namely, voice and accountability, political stability, government effectiveness, regulation quality, rule of law and control of corruption); \( \ln DFCFR \times Abscap \) are the natural logarithms of the interaction terms between disaggregated foreign capital and financial resources and factors of absorptive capacity; \( \ln FDI \times Abscap, \ln STFCF \times Abscap, \ln LOANS \times Abscap, \ln ODAID \times Abscap \) and \( \ln REMIT \times Abscap \) are the natural logarithms of the interaction terms between FDI, short term foreign capital flows, cross-border bank lending, overseas development assistance and official aid remittances, and the factors of absorptive capacity, respectively; \( \gamma_1 \) is a parameter reflecting the speed of convergence of GDP per capita growth from one period to the next; \( \tau \) is a constant; \( e_t \) time-specific effects which are also presumed to be independently and identically distributed over all time periods; \( u_i \) is an unobserved country-specific effects which are also independently and identically distributed over the countries in COMESA region; \( u_i \) the error term which is assumed to be independently and identically distributed over all time periods in country \( i \); and \( \gamma_0, \gamma_2, \gamma_3, \gamma_4, \gamma_5, \gamma_6, \gamma_7, \gamma_8 \) and \( \gamma_9 \) are the other parameters to be estimated. A positive (negative) sign of the parameters suggests that an increase in the respective variable by one percent leads to a rise (fall) of GDP per capita by the percentage size of the coefficient. In model equations 3.6, the coefficient(s) \( \gamma_9 \) is interpreted as the marginal rise in the impact of FDI or a particular component of financial resources on the real GDP per capita when the concerned absorptive capacity factor improves. The vice-versa also holds true.

From the model specification in equation 3.6, three possible results can be drawn to assess the effect of the factors of absorptive capacity of COMESA countries in determining the contribution of disaggregated foreign capital and financial resources in GDP per capita growth. First, if \( \gamma_7 \) and \( \gamma_9 \) both have a (negative) positive sign, then disaggregated foreign capital and financial resources flowing to the region have an unambiguously (negative) positive effect on GDP per capita growth. Second, if \( \gamma_7 \) is positive while \( \gamma_9 \) is negative, then disaggregated foreign capital and financial resources have a positive growth effect, and this effect diminishes with the improvement in the absorptive factors of the host region. Third, if \( \gamma_7 \) is negative and \( \gamma_9 \) is positive, then this means that the COMESA countries have to achieve a certain threshold level (in terms of development of absorptive capacity) for disaggregated foreign capital and financial resources to have a positive impact on GDP per capita growth in the region.
The threshold of the absorptive capacity of the COMESA countries is computed by finding the partial impact of disaggregated foreign capital and financial resources (represented by DFCFR) on GDP per capita as follows:

\[
\frac{\partial Y_{i,t}}{\partial DFCFR} = \gamma_7 + \gamma_9, \quad Abscap = 0, \text{ then the threshold or break-even-point of COMESA countries’ absorptive capacity is given by:}
\]

\[
(BEP) = \frac{-\gamma_7}{\gamma_9}
\]

### 3.2.3 Estimation Variables

The choice of the variables in the GDP growth model equation 3.6 is made in line with the literature and based on availability of data and concern about degrees of freedom. The growth performance of GDPPC\(_{i,t}\) measures the overall performance of an economy. The economic growth in this study is measured by the nominal real growth of the GDP per capita. The current GDPPC\(_{i,t}\) 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, \(\gamma_1 > 0\).

The initial GDP per capita, GDPPC\(_{i,0}\), is measured by the real GDP per capita deflated by the GDP deflator (base 2000=100), lagged once. The lower the starting level of real GDP per capita the higher the predicted economic growth (Barro, 1991; Levine & Renelt, 1992). Consequently, \(\gamma_0 < 0\).

HUMCAP, represented by the Human Development Index (HDI) in this study, is expected to affect current GDP growth positively and enhance the ability of the COMESA region to absorb and benefit from spillovers of disaggregated foreign capital and financial resources. According to Jongwanich (2007) 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 GDP per capita growth and enables the host economy to absorb and benefit from spillovers of disaggregated foreign capital and financial resources. It is expected that \(\gamma_2 > 0\) and \(\gamma_8 > 0\).

DINV has a positive effect on the current GDP growth. Increased rate of domestic capital investment promotes productivity in an economy. Domestic investment in this study is represented
by the percentage share of gross fixed capital formation in constant dollars less changes in net FDI stocks to GDP. Thus, $\gamma_3 > 0$.

Trade openness is expected to enlarge markets and expand domestic investment 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 disaggregated foreign capital and financial resources on GDP per capita growth. TOPEN is therefore expected to have a positive impact on the GDPPC$_{i,t}$ and enhance the ability of the COMESA region to absorb and benefit from the spillovers of disaggregated foreign capital and financial resources. Hence, it is expected that $\gamma_4 > 0$ and $\gamma_8 > 0$.

Chinn-Ito index of financial openness, KAOPEN, is also expected to guarantee greater inflow of foreign capital and financial resources and expand domestic investment so as to growth the host economies (Klein, 2003; Quinn & Toyoda, 2008). The capital account liberalization by member countries of the COMESA region could also increase the significance of the impact of disaggregated foreign capital and financial resources on GDP per capita growth. KAOPEN is therefore expected to have a positive impact on the GDPPC$_{i,t}$ as well as enhance the ability of the COMESA region to absorb and benefit from the spillovers of disaggregated foreign capital and financial resources. Hence, it is expected that $\gamma_4 > 0$ and $\gamma_8 > 0$.

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 growth impact of PUBDEBT, measured by the percentage share of the gross debt liabilities to GDP. 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 Larrain 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 GDP growth of the host country. Therefore, $\gamma_6 < 0$.

FDI, measured by net FDI stocks$^{73}$, 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 impacts positively on current GDP growth. Hence, $\gamma_7 > 0$.

STFCF, measured by the percentage share of short term foreign capital flows, net errors and commissions, and capital transactions excluded from FDI and foreign portfolio investment to GDP, is expected to impact either positively or negatively to GDP growth in the COMESA region. Increased short term foreign capital flows into the COMESA region are expected to promote GDP per capita growth by providing additional foreign exchange capital to finance domestic business investment, improve human capital by increasing resources for health and education and reduce macroeconomic volatility. Conversely, the increased inflow of short term foreign capital flows may result into bankruptcies, output losses, currency appreciation and financial crisis and consequently poor GDP per capita growth. Hence, $\gamma_7 > 0$ or $\gamma_7 < 0$.

LOANS, represented by cross-border bank lending, provide resources for investment. It is therefore expected that LOANS affect current GDP growth positively. Therefore, $\gamma_7 > 0$. ODAAID is expected to affect current GDP growth positively. This is because ODA and foreign aid complements domestic resources, supplements domestic savings, closes the foreign exchange gap and provides access to modern technology and managerial skills. Thus, $\gamma_7 > 0$. REMIT provide foreign exchange, fund local investment and increase resources for health and education to improve human capital. Additionally, when a big percentage of remittances is spent on

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$^{73}$ 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).
consumption in place of productive activities, the link between REMIT and GDP growth can be negative or positive. Hence, $\gamma_7 > 0$ or $\gamma_7 < 0$.

The a priori expectation is that financial sector development (FSD), represented by the percentage share of bank credit to GDP, is expected to have a positive impact on the GDPPCi,t and also enhance the ability of the COMESA region to absorb and benefit from spillovers of disaggregated foreign capital and financial resources. Previous studies have established that improvement in access to bank credit promotes GDP per capita growth (Durham, 2003; Shahbaz et al., 2011). Therefore, $\gamma_8 > 0$.

Better voice and accountability, political stability and absence of violence/terrorism, government effectiveness, regulatory quality, effective and efficient rule of law and low prevalence of corruption encourage investment, enhance protection of property and contract rights of investors and promote economic growth (Durham, 2003). VOA, POSTAB, GOVEF, REGQUA, RULAW and COC are expected to have a positive impact on the GDPPCi,t and also enhance the ability of the COMESA region to absorb and benefit from FDI and different components of financial resources. The six institutional quality variables are measured by the score on the aggregate world governance indicators. Thus, $\gamma_8 > 0$.

According to Aschauer (1989), Barro (1990), Greene and Villanueva (1991) and World Economic Forum (2016), 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, $\gamma_8 > 0$.

Low technology gap between the host and home country spurs economic growth and increases the direct impact and technological and knowledge spillovers of disaggregated foreign capital and financial resources (Colen et al., 2008; Elboiasi, 2011; Sjoholm, 1999). The a priori expectation is that TG impacts negatively on GDPPCi,t and low TG enhances the ability of the COMESA
region to absorb and benefit from spillovers of FDI and different components of financial resources. Therefore, \( \gamma_8 < 0 \).

Review of the literature on absorptive capacity in section 3.1.6 show that well-developed human capital, well-developed financial sector, greater openness trade and capital account, quality development infrastructure, low technology gap between host and home countries and institutional quality of voice and accountability, political stability, government effectiveness, regulations, rule of law and control of corruption have a positive effect on the growth impact of disaggregated foreign capital and financial resources. These absorptive capacity variables are thus interacted with the foreign capital and financial resources.

### 3.3 Data Analysis and Estimation Technique

This study analyses the relative impact of FDI, short term foreign capital flows, cross-border bank lending, remittances, overseas development assistance and official aid on the GDP per capita growth in the COMESA region. The study utilizes a panel data drawn from 19 countries in the COMESA region and covers the period running from 2000 to 2015. Panel data modelling is preferred as it offers rich data sets with greater variability and less collinearity among the variables. It also controls for heterogeneity and effects of missing variables among others.

The study analyses a dynamic panel data GDP per capita model where the lagged dependent variable, the GDP per capita, is added to the explanatory variables. It is argued that the lagged per capita GDP has an impact on the current GDP per capita. However, dynamic panel data models are faced with challenges such as biased coefficients if mis-specification of dynamics results into autocorrelated errors. They also ignore stationarity of variables. The main challenges of dynamic panel data modelling are endogeneity, unobserved heterogeneity and short panel bias. These challenges are resolved by including appropriate and adequate explanatory variables into the growth equation, lagging the potentially endogenous variable(s) by one or more periods, using appropriate proxies for variables and estimating the growth model by applying the generalized
method of moments (GMM) technique proposed by Arellano and Bond (1991). The method is also called GMM-difference estimator.

The instrument variables method is chosen so as to control for the possible endogeneity problem that may arise from including lag dependent variables. It offers valid instruments as long as there is no second order serial correlation. It therefore yields consistent estimates of the parameters (Baltagi, 2008). Moreover, the first-step Arellano and Bond (1991) GMM difference estimator is used as it has been found to result in more reliable inferences. The asymptotic standard errors from the second-step Arellano and Bond (1991) GMM-difference estimator has been found to have a downward bias (Blundell & Bond, 1998). The Arellano and Bond (1991) GMM difference estimator also solves the problem of short panel bias. The method is known to account for dynamics and resolve endogeneity and short panel bias problems.

The first step of the procedure is to remove the time effect, $e_t$, by deducting from each variable its cross mean in period $t$. Next, the variables transformed into first differences remove unobservable heterogeneity ($v_i$). The endogenous problems are resolved by applying a second and higher order lags of these variables as instruments in the case of Arellano and Bond (1991). This approach is valid provided that second order serial correlation is absent, something which is tested in each specification. Additionally, to ensure validity of this approach, a Sargan test of over-identifying restrictions, which tests the contemporaneous correlation between the residual and the set of instruments, is reported together with the estimates. Arellano and Bond’s (1991) m2 test, which ensures that the residuals from the estimated regressions are not second-order correlated but are first-order correlated, is also reported.

The study uses inferential statistics, especially F-statistic, to test the hypotheses. In order to generate regression results for the study, Econometric package called Gnu Regression,  

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74 The estimation technique is explained in more detail in Appendix A1.

75 Arellano and Bond (1991) argued that, if the residuals $u_i$ were first-order correlated, then $y_{i,t-2}$ would be correlated with $\Delta u_i$ and therefore it could not be used as an instrument. The same is true of any regressor which is correlated with $u_i$.  

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Econometrics and Time-Series Library (GRETTL) is used. The results are then summarized into tables for ease of analysis and interpretation.

### 3.4 Descriptive Statistics

The summary descriptive statistics are provided in Table 2.3 in the previous chapter two. The summary statistics describe the features of the data used in the study. The panel data set is rich. Consequently, the statistics are deemed normal and appropriate for the empirical analysis.

FDI has the highest mean (28.4%) and minimum value (0.0%), while remittances has the lowest mean (3.04%) as well as minimum value (0.0%). Thus, FDI forms the largest component of foreign capital, while remittances forms the smallest component of financial resources.

The summary statistics for the rest of the variables analyzed in this study, including real GDP per capita, domestic investment, human capital development, public debt, trade openness, capital account openness, inflation, financial sector development, infrastructure development, technology gap, voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption are as explained in section 2.4 in chapter two.

### 3.5 Multicollinearity of the Independent Regressors

The results of the correlation of variables are presented in Table 2.4 presented in section 2.5 in chapter two. An explanatory variables correlation matrix is used to test the presence of multicollinearity in the dynamic panel data GDP per capita model specified in equation 3.6. The results in Table 2.3 indicate that all the zero-order correlation coefficients between any two regressors are low, ruling out the presence of perfect or near perfect linear relationship. As argued in Gujarati (2003), multicollinearity is a serious problem if the zero-order correlation coefficient between two regressors is in excess of 0.8. Thus, there is no relationship among the independent variables, implying that the regression obtains determinate coefficients and finite standard errors. All the independent variables can therefore be included in the estimated model specification.

On one hand, Table 2.3 indicates that GDP per capita is positively correlated with domestic investment, human capital development, trade openness, capital account openness, short term foreign capital flows, cross-bored bank lending, remittances, overseas development assistance and
official aid, financial sector development, development of quality infrastructure, voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption, as theoretically predicted.

On the other hand, the results show that economic growth is negatively correlated with the initial GDP per capita, confirming convergence. Additionally, GDP per capita is negatively related to public debt, inflation and technology gap, as predicted in theory. Further, the results indicate that FDI is negatively associated to GDP per capita, contrary to economic theory.

3.6 Regression Results and Discussions

The regression results of the analysis of relative impact of FDI, short term foreign capital flows, cross-border bank lending, overseas development assistance and official aid, and remittances on the GDP per capita growth are reported in Table 3.1.

The diagnostic tests proves lack of second-order serial correlation, validity of instruments variables and unrelated regressors, implying that the models are correctly specified. The results contained in Table 3.1 rejects absolute convergence, but tend to support conditional convergence. The speed of adjustment, λ, usually falls between 0 and 1. The results show that it is high, between 0.684 and 0.901. This result means that there is almost immediate adjustment of GDP per capita growth from one year to the next. The Arellano-Bond estimator does not exhibit substantial downward bias as the coefficient on the lagged dependent variable is not close to unity, the dependent variable does not follow a random walk and lagged levels correlate well with lagged differences. It also confirms absence of a weak instrument problem.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Variant specifications of the GDP Growth Model</th>
<th>Thress hold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.107 (0.488) 0.130 (0.652) 0.272 (0.281) 0.209 (0.441) 0.078 (0.686) 0.285 (0.136) 0.138 (0.589) 0.078 (0.736) 0.270 (0.260) 0.307 (0.125) 0.393 (0.955) 0.377 (0.502) 0.274 (0.307) 0.324 (0.249)</td>
<td></td>
</tr>
<tr>
<td>Log Initial GDP per Capita (lnY_{t-1})</td>
<td>-0.284 (0.332) -0.400 (0.011)* -0.263 (0.031)** -0.322 (0.022)** -0.346 (0.178) -0.268 (0.036)** -0.418 (0.013)** -0.193 (0.903) -0.383 (0.019)** -0.238 (0.045)** -0.206 (0.047)** -0.224 (0.046)** -0.329 (0.025)** -0.264 (0.026)**</td>
<td></td>
</tr>
<tr>
<td>Log GDP per Capita (lnY_{t-1})</td>
<td>0.316 (0.000)* 0.189 (0.002)* 0.148 (0.014)** 0.175 (0.012)** 0.189 (0.003)** 0.183 (0.009)** 0.191 (0.006)** 0.247 (0.008)** 0.153 (0.010)* 0.099 (0.008)* 0.184 (0.017)** 0.137 (0.018)** 0.162 (0.004)** <em>0.180 (0.000)</em></td>
<td></td>
</tr>
<tr>
<td>Human capital development (HUMCAP)</td>
<td>0.568 (0.055)* 0.605 (0.024)** 0.579 (0.036)* 0.522 (0.034)** 0.592 (0.010)** 0.684 (0.012)** 0.497 (0.050)* 0.677 (0.009)* 0.609 (0.013)** 0.670 (0.008)** 0.666 (0.002)** 0.605 (0.012)** 0.605 (0.006)**</td>
<td></td>
</tr>
<tr>
<td>Log domestic investment (lnDINV)</td>
<td>0.142 (0.046) 0.152 (0.036)** 0.175 (0.030)** 0.107 (0.009)** 0.156 (0.003)** 0.142 (0.002)** 0.032 (0.547) 0.173 (0.018)** 0.116 (0.007)* 0.144 (0.036)* 0.120 (0.058)* 0.182 (0.030)** 0.154 (0.030)**</td>
<td></td>
</tr>
<tr>
<td>Log public debt (lnPUBDEBT)</td>
<td>-0.122 (0.031) -0.145 (0.027)** -0.125 (0.033)** -0.153 (0.154) -0.155 (0.018)** -0.157 (0.023)** -0.086 (0.449) -0.174 (0.019)** -0.112 (0.298) -0.162 (0.017)** -0.133 (0.023)** -0.143 (0.030)** -0.095 (0.497)</td>
<td></td>
</tr>
<tr>
<td>Log Trade openness (lnTOPEN)</td>
<td>0.066 (0.969) 0.072 (0.651) 0.076 (0.638) 0.104 (0.547) 0.004 (0.983) 0.014 (0.945) 0.036 (0.827) 0.108 (0.511) 0.113 (0.527) 0.110 (0.478) 0.114 (0.492) 0.123 (0.477)</td>
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<tr>
<td>Capital account openness (KAOPEN)</td>
<td>0.125 (0.059)*</td>
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<tr>
<td>Inflation (INFLA)</td>
<td>-0.130 (0.037)** -0.143 (0.013)** -0.136 (0.029)** 0.129 (0.021)** -0.138 (0.035)** -0.139 (0.044)** -0.129 (0.008)** -0.127 (0.044)** -0.128 (0.046)** -0.136 (0.030)** -0.123 (0.051)* -0.123 (0.041)** -0.125 (0.035)**</td>
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</tr>
<tr>
<td>Log foreign direct investment (lnFDI)</td>
<td>-0.352 (0.023)** -0.352 (0.027)** -0.417 (0.012)** -0.325 (0.028)** -0.429 (0.003)** -0.531 (0.002)** -0.449 (0.021)** -0.540 (0.007)** -0.477 (0.009)** -0.575 (0.021)** -0.552 (0.006)** -0.579 (0.008)** -0.468 (0.019)**</td>
<td></td>
</tr>
<tr>
<td>Log short term foreign capital flows (lnSTFCF)</td>
<td>0.087 (0.080)* 0.680 (0.084)* 0.100 (0.074)* 0.231 (0.046)** 0.154 (0.095)* 0.085 (0.798) 0.133 (0.072)* 0.236 (0.094)* 0.162 (0.096)* 0.135 (0.068)* 0.109 (0.747) 0.080 (0.980) 0.454 (0.898)</td>
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<tr>
<td>Log cross-border bank lending (lnLOANS)</td>
<td>0.610 (0.016)* 0.445 (0.035)** 0.375 (0.044)** 0.327 (0.363) 0.540 (0.029)** 0.748 (0.016)** 0.146 (0.074)* 0.651 (0.036)** 0.101 (0.048)** 0.893 (0.071) 0.571 (0.080)* 0.117 (0.059)* 0.112 (0.041)**</td>
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<tr>
<td>Log overseas development assistance and official aid (lnODAID)</td>
<td>0.176 (0.060)* 0.172 (0.072)* 0.223 (0.028)** 0.168 (0.071)* 0.179 (0.021)** 0.232 (0.005)** 0.177 (0.008)** 0.209 (0.015)** 0.155 (0.018)** 0.236 (0.006)** 0.230 (0.004)** 0.233 (0.007)** 0.185 (0.020)**</td>
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<tr>
<td>Log remittances received from abroad (lnREMIT)</td>
<td>0.375 (0.038)* 0.739 (0.068)* 0.323 (0.043)** 0.348 (0.355) 0.162 (0.069)* 0.365 (0.030)* 0.611 (0.021)** 0.512 (0.012)** 0.858 (0.034)** 0.517 (0.010)** 0.839 (0.047)** 0.799 (0.075)* 0.611 (0.095)*</td>
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<tr>
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<td>LOANS*REGQUA</td>
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| Number of observations  | 266  | 228  | 228  | 228  | 228  | 228  | 228  | 228  | 228  | 228  | 228  | 228  | 228  | 228  | 228  |
| Number of instruments   | 107  | 114  | 119  | 119  | 119  | 120  | 120  | 120  | 120  | 120  | 120  | 120  | 120  | 120  | 120  |
| AB Z-Statistic test     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| AB Z-statistic test     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| second-order            | 1.131| -0.980| -0.788| -0.321| -1.023| -1.158| -0.859| -1.404| -1.794| -1.177| -1.439|      |      |      |      |
| Sargan over-            | 141.82| 156.29| 163.59| 154.34| 153.05| 158.60| 139.01| 157.94| 158.49| 155.77| 162.28|      |      |      |      |
| identification test     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Wald (joint) test       | 17.60 | 154.97| 2311.91| 6986.67| 276.54| 8514.86| 5615.96| 1524.58| 1455.98| 2329.35| 6849.1| 8144.19| 5373.3| 3296.85|      |
| Adjustment Speed, λ = 1-γ₀ | 0.684| 0.811| 0.852| 0.825| 0.811| 0.817| 0.809| 0.758| 0.847| 0.901| 0.816| 0.863| 0.838| 0.820|      |

Note: ρ-values are indicated in parentheses with *, **, *** denoting levels of significance at 10%, 5% and 1%, respectively. The Arellano and Bond (AB) Z-statistic tests the null hypothesis that the residuals are first-order serial correlated (AB Z-Statistic test first-order) and the residuals are not second-order serial correlated (AB Z-Statistic test second-order). The Wald test, a joint significance test, tests the null hypothesis that the parameters of time dummies are equal to zero. The threshold required for every absorptive capacity factor for the region to absorb and benefit from FDI, short-term foreign capital flows, cross-border bank lending, overseas development assistance and aid, and remittances, respectively, is reported in the last eight rows. The threshold of absorptive capacity factors is computed using equation 3.7.

**Source:** Author’s computations
3.6.1 The Impact of FDI on Economic Growth in the COMESA Region

The results suggest that FDI and different components of financial resources matter for economic growth.

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. The findings are supported by previous authors such as Agbloyor et al. (2014), Bos et al. (1974), Jugurnath et al. (2016), Prebisch (1968), Saltz (1992), Saqib et al. (2013) and Singer (1950) and among others, who found a negative and statistically significant effect of FDI on growth. The results are however contrary to the general belief that FDI is a key source of growth (Borensztein et al., 1998; Findlay, 1978; Hayami, 2001; Jenkins & Thomas, 2002; Todaro & Smith, 2003; World Bank, 2000).

Several researchers have argued that negative impact of FDI on the growth of GDP per capita in Africa could be explained by a number of reasons, including the link between FDI, local investment and the economic, political and institutional conditions of the region. Researchers such as Ndikumana and Verick (2008) noted that the limited effect of FDI in the case of Africa could be attributed to the lack of synergies between FDI and domestic investment. Other researchers including UNCTAD (1999) argued that multinational corporations are involved in the exploitation of natural resources. This view is supported by UNCTAD (2007) who argued that most FDI in Africa is targeted at the primary sector and Asiedu (2002) who added that most FDI to sub-Saharan Africa is in the resource extraction sectors. While this can be important in providing employment, at least for the unskilled (expatriates typically fill the skilled jobs), Morrissey (2012) argued that there are typically few linkages to domestic firms and few spillover opportunities. The author also argued that the challenge is that there is so little value-added processing of the resources, which is where the degree of technology and know-how required is greater and there is more potential for transfer and learning. Thus, broadly, the most important sector for FDI in sub-Saharan Africa provides few benefits other than direct employment and a share of export earnings.

FDI in sub-Saharan Africa has not in general been associated with significant linkages or spillovers. Morrissey (2012) observed that China has become a major investor in sub-Saharan Africa, particularly in the oil sector (in Sudan, Nigeria and Angola) and infrastructure construction.
projects, but its FDI delivers few linkages and almost no spillovers. Although China tends to invest in the same resource-rich sub-Saharan African countries that have historically attracted FDI, the Chinese firms typically bring their own machinery, equipment and even workers, resulting in minimal linkages. In addition, Morrissey (2012) argued that China subsidises investment, either directly (by providing subsidies to its firms) or indirectly by supporting related infrastructure projects. For example, ports and roads may be built to transport the extracted resources. Often, firms that entered with machinery and labour subsequently establish themselves in the local economy. This reduces potential linkages and may even undermine local suppliers and producers. Thus, most FDI to sub-Saharan Africa provide little linkages and spillovers.

Other reasons for the negative impact of FDI on GDP per capita growth in the African continent are lack of competition among the FDI players in Africa and distorted regulatory and incentive frameworks (UNCTAD, 2007). Existence of fiscal and financial incentives also boost FDI, but only when other factors are in place. The tax incentives or rebates have been shown to benefit short-term investments in footloose firms such as banking and general services that can easily exit from one jurisdiction to another (Pigato, 2000). This implies that FDI may not have lasting positive impact on the GDP per capita growth in the African continent, COMESA region included. In addition, poor governance and weak institutions in Africa are to blame for deterring FDI that is most conducive to growth. Asiedu (2006) argued that relatively high corruption and political instability in sub-Saharan Africa deters FDI.

However, FDI could have impacted positively on the economic growth in individual member countries of the COMESA region. The factors determining the flow of FDI into host countries include the size and growth of markets, availability of physical and natural resources, cost and quality of labor, quality of infrastructure and institutions. Market seeking FDI is pulled to economies with large markets or markets that have growth potential. Lower cost of skilled labor decreases the production cost, all other factors held constant. Morrissey (2012) added that low human capital development, undeveloped financial markets, low Openness of the economy, weak
institutions (regulation quality and rule of law) and low productivity of investment are to bale for the negative impact of FDI in Africa\textsuperscript{76}.

Most FDI is also attracted in countries that are rich in natural and mineral resources, oil and gas (Ajayi, 2005) and those that have strengthened their macroeconomic performance and made their economies more efficient through reforms (Macias & Massa, 2009; Pigato, 2000; Ronge & Kimuyu, 1997). FDI also goes to countries that pay higher returns to capital and those with favorable investment and business climate. It is possible that FDI has had significant and positive impact on the economic growth of the countries in the COMESA region that possess these factors.

The interaction term (FDI*HUMCAP)\textsuperscript{77} have a positive and significant coefficient at 5\% level of significance, implying that development of human capital has a positive effect on the growth impact of FDI in the COMESA region. The result confirms findings by previous studies by Ndoricimpa (2009), Borensztein et al. (1998) and Saggi (2002), among others. These results also suggest that a minimum stock of human capital is required for FDI to stimulate economic growth in the COMESA region, confirming the results of Borensztein et al. (1998), Elboiashi (2011), Ford, Rork and Elmslie (2008) and Xu (2000). From the last column of Table 3.1, the human development index threshold required equals 0.48, suggesting that only Egypt, Kenya, Libya, Mauritius and Swaziland with human development index of above 0.48 will gain more efficiently from positive growth impact of FDI as confirmed by the results presented in the second column of Table 2.6.

The coefficient of the interaction term between FDI and openness of the economy (FDI*TOPEN)\textsuperscript{78} is positive and statistically significant at the 5 percent level of significance, suggesting that more openness of the economy leads to a marginal increase in the impact of FDI on the GDP per capita

\textsuperscript{76}Other reasons for the negative impact of FDI on economic growth in the COMESA region could be attributed to attraction of FDI with limited linkages and spillovers and high corruption and political instability in African countries (UNCTAD, 1999; Asiedu, 2002; 2006).

\textsuperscript{77} The interaction term (FDI*HUMCAP) capture the effect of a well-developed human capital is likely to have on the absorptive capability of the stock of foreign direct investment including technology and knowledge.

\textsuperscript{78} (FDI*TOPEN) is an interaction term purposed to capture the effect of a more open economy is likely to have on the absorptive capability of the flow of foreign direct investment including technology, knowledge, among others.
growth in the COMESA region. Openness of an economy is associated with installation of trade and foreign exchange regimes that are appropriate to attract FDI. This result concurs with economic theory and previous findings by Balasubramanyam et al. (1996), Zhang (2001) and Bengoa and Sanchez-Robles (2003) who pointed out that openness of the economy positively affects the impact of FDI on growth. Further, the results show that turning point of the degree of openness of the economy equal to 59.6% of total trade to GDP for the region to positively benefit from FDI. Additionally, the third column of Table 2.6 show that only Djibouti, DR Congo, Libya, Madagascar, Malawi, Mauritius, Seychelles, Swaziland, Zambia and Zimbabwe can satisfy a requested degree of economy openness required to ensure that FDI has a positive impact on GDP per capita growth in a more efficient manner over the average of the period from 2000 to 2015.

The coefficient of the interaction term of FDI with the capital account openness, \((\text{FDI} \times \text{KAOPEN})\), is significant and positive. This result suggests that a threshold of 1.98 of capital account openness is required for FDI to contribute positively to economic growth. The results presented in column five of Table 3.1 and column four of Table 2.6 show that only Djibouti, Swaziland and Uganda will positively benefit from attracting FDI more efficiently when the capital account liberalization is above 1.98.

The positive and significant coefficient on the interaction term \((\text{FDI} \times \text{FSD})\) suggests that well-developed financial sector has a positive effect on the growth impact of FDI, confirming the previous findings by Agbloyor et al. (2014), Ndoricimpa (2009), Durham (2004), Hermes and Lensink (2003) and Shahbaz et al. (2011) who argued that improved bank credit enables economies to attract more FDI and well-developed local financial system promotes the diffusion of technology process linked with FDI. The last column of Table 3.1 and column five of Table 2.6 show that only Djibouti, Egypt, Kenya, Mauritius, Seychelles and Zimbabwe reached the turning point of 22.6% required so as to transform the negative impact of FDI on economic growth into a

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79 \((\text{FDI} \times \text{KAOPEN})\) is an interaction term aimed at measuring the effect capital account liberalization is likely to have on the absorptive capability of the FDI flows to the COMESA region.

80 \((\text{FDI} \times \text{FSD})\), is the interaction term aimed at capturing the effect financial sector development is likely to have on the absorptive capability of the flows of FDI, cross-border bank lending, and ODA and aid to the COMESA region.
positive one more efficiently over the average of the 2000-2015 period. This results confirms the findings of Elboiashi (2011), Durham (2004) and Shahbaz et al. (2011).

Results in the ninth column of Table 3.1 show that the parameter of the interaction term (FDI*INFR)\(^{81}\) is positive and statistically significant. 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) 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. Tables 3.1 and 2.6 show that the region requires a score of 0.00 of infrastructure to realize a positive growth impact of LOANS and all COMESA countries pass this threshold to exploit gains from LOANS more efficiently.

The parameter of the interaction term of FDI with the technology gap, (FDI*TG)\(^{82}\), is significantly and negatively related to economic growth. This suggests that a certain level of technological development is required for FDI to contribute positively to growth, confirming Li and Liu (2005) findings. The results presented in column seven of Table 3.1 and column six of Table 2.6 show that only DR Congo, Egypt, Kenya, Libya, Mauritius, Seychelles, Sudan, Swaziland and Zambia will positively benefit from attracting FDI more efficiently when the technology gap level is below 22.5%.

The positive and statistically significant parameter of the interaction term between FDI and voice and accountability variable (FDI*VOA)\(^{83}\), suggests that improvement in the quality of voice and

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\(^{81}\) (FDI*INFR) is an interaction term meant to capture the effect development of high quality infrastructure is likely to have on the absorptive capability of the FDI.

\(^{82}\) (FDI*TG) is an interaction term aimed at measuring the effect technology gap is likely to have on the absorptive capability of the FDI flows to the COMESA region.

\(^{83}\) (FDI*VOA) is an interaction term aimed at measuring the effect voice and accountability institutional quality is likely to have on the absorptive capability of the FDI flows to the COMESA region.
accountability governance institutions has a positive effect on the growth impact of FDI. Further, the results show that the region requires a score of 0.72 of voice and accountability institutional quality so as to grow the economy from FDI. The seventh column of Table 2.6 show that only Mauritius satisfy the required threshold of quality of VOA institutional quality so as to transform the negative impact of FDI on economic growth into a positive one more efficiently over the average of the period from 2000 to 2015.

Table 3.1 shows that parameter of the interaction term between FDI and political stability variable (FDI*POSTAB)\textsuperscript{84} is positive and statistically significant, confirming findings by Asiedu (2006). The results suggest that peace and political stability has a positive effect on the growth impact of FDI. The results also show that the region requires a score of 0.71 of political stability to positively gain from FDI. The eighth column of Table 2.6 show that only Mauritius and Seychelles satisfy the required threshold of political stability in order to transform the negative impact of FDI on economic growth into a positive one in a more efficient manner over the average of the 2000-2015 period.

The coefficient of the interaction term (FDI*GOVEF)\textsuperscript{85} is positive and statistically significant, suggesting that effective and efficient delivery of public and civil services enhance the ability of the COMESA region to absorb and benefit from FDI spillovers. Lengthy bureaucracies of establishing businesses in an economy, including complex and tedious procedures deter FDI. Government effectiveness may also reduce the costs of doing business for foreign investors. Tables 3.1 and 2.6 show that the region requires a score of 0.59 of government effectiveness for the region to transform the negative growth impact of FDI into a positive one and only Mauritius passed this threshold and can benefit from FDI in a more efficient manner.

\textsuperscript{84} (FDI*POSTAB) is an interaction term aimed at measuring the effect political stability is likely to have on the absorptive capability of the FDI flows to the COMESA region.

\textsuperscript{85} (FDI*GOVEF) is an interaction term meant to capture the effect government effectiveness is likely to have on the absorptive capability of the FDI flows to the COMESA region.
The results show that the interaction term between the regulatory quality and the FDI, (FDI*REGQUA)\textsuperscript{86}, obtains a positive and statistically significant parameter at 1 percent level of significance, concurring with de Soto and Abbot (2002), Durham (2003:2004) and Keefer and Shirley (2000). The results also show that a score of 0.69 of regulatory quality is required for the region to realize positive growth from FDI. Table 2.6 show that only Mauritius reached this break-even point and can exploit the gains of FDI more efficiently.

The interaction term (FDI*RULAW)\textsuperscript{87} has a positive and statistically significant parameter at 5 percent level of significance. This result suggests that improvement in the quality of the rule of law has a significant positive impact on the GDP per capita growth in the COMESA region through interaction with FDI. These results are supported by Durham (2004), Keefer and Shirley (2000) and Olofssdotter (1998) who found that regulation of businesses, the protection of property and contract rights and bureaucratic efficiency is positively related to economic growth through interaction with FDI. The calculated threshold for the score institutional quality of rule of law is given by 0.78, thus practically any improvement in the institutional quality of rule of law above this threshold would result into a positive growth effect of FDI. However, the results presented in Table 2.6 show that only Mauritius pass this threshold and is able to exploit the benefits of FDI more efficiently.

Finally, the interaction term (FDI*COC)\textsuperscript{88} obtain a positive and statistically significant coefficient at the 10 percent level of significance, concurring with Durham (2004) who found that control of corruption exerts a positive and statistically significant relationship with economic growth through FDI and Asiedu (2002) who argued that, corruption hampers FDI inflows as it results into an extra cost and creates uncertainty, which deters the flow of FDI. Table 3.1 show that a threshold equal to 0.73 score of institutional quality of control of corruption must be reached for the COMESA

\textsuperscript{86} (FDI*REGQUA) is an interaction term aimed at measuring the effect regulatory quality is likely to have on the absorptive capability of the FDI flows to the COMESA region.

\textsuperscript{87} (FDI*RULAW) is an interaction term aimed at approximating the effect quality of the institutions of rule of law is likely to have on the absorptive capability of the FDI flows to the COMESA region.

\textsuperscript{88} (FDI*COC) is an interaction term aimed at capturing the effect the quality of the institution of control of corruption is likely to have on the absorptive capability of the FDI flows to the COMESA region.
region to realize a positive growth effect from FDI. Further, results presented in Table 2.6 show that none of the COMESA countries pass this turning point.

3.6.2 The Impact of Short Term Foreign Capital Flows on Economic Growth in the COMESA Region

The results also suggest that short-term foreign capital flows positively affects GDP per capita growth, confirming economic theory that capital flows promote economic growth by providing foreign exchange that is invested in productive activities and complement savings while the capital transactions raise the investment levels in the host nations. The results proves that short-term capital reversals do not lead to bankruptcies and productivity losses in the COMESA region as predicted by Baharumshah and Thanoon (2006) and Reisen and Soto (2001).

The parameter of the interaction term of STFCF with the capital account openness, (STFCF*KAOPEN), is significant and positive. This result suggests that a threshold of 1.44 of capital account openness is required for FDI to contribute positively to economic growth. The results presented in column five of Table 3.1 and column four of Table 2.6 show that only Djibouti, Malawi, Rwanda, Swaziland and Uganda will positively benefit from attracting FDI more efficiently when the capital account liberalization is above 1.44.

The coefficient of the interaction term between STFCF and technology gap is significant and negative. This result suggests that a certain level of technological gap, equal to 16.6%, is required for STFCF to contribute positively to GDP per capita growth, confirming Li and Liu (2005) findings. The results presented in Table 2.6 show that only Egypt, Libya, Mauritius, Seychelles, Sudan, Swaziland and Zambia are able to exploit the positive impact of STFCF on growth more efficiently when the technology gap level is below this threshold.

89 (STFCF*KAOPEN) is an interaction term aimed at measuring the effect capital account liberalization is likely to have on the absorptive capability of the short term foreign capital flows to the COMESA region.

90 (STFCF*TG) is an interaction term aimed at measuring the effect technology gap is likely to have on the absorptive capability of the short term foreign capital flows to the COMESA region.
The institutional quality is important for the COMESA region to absorb and benefit from the spillovers of short term foreign capital flows. The positive and statistically significant parameter of the interaction term (STFCF*VOA)\(^91\), suggests that improvement in the quality of voice and accountability governance institutions has a positive effect on the growth impact of STFCF. Additionally, the results show that the region requires a score of 0.62 of VOA institutional quality to realize a positive growth from FDI and column seven of Table 2.6 show that only Mauritius satisfy the required threshold of quality of VOA institutional quality so as to realize a positive impact of STFCF on economic growth more efficiently over the average of the period from 2000 to 2015.

The results in Table 3.1 show that the coefficient of the interaction term between FDI and political stability variable (STFCF*POSTAB)\(^92\) is positive and statistically significant, suggesting that peace and political stability have a positive effect on the growth impact of FDI. The results also show that the region requires a score of 0.57 of political stability to realize a positive growth from FDI. Table 2.6 show that only Mauritius and Seychelles satisfy the required threshold of political stability in order to realize a positive impact of STFCF on GDP per capita growth more efficiently over the average of the 2000-2015 period.

The positive and statistically significant coefficient of the interaction term (FDI*GOVEF)\(^93\), suggest that effective and efficient delivery of public and civil services enhance the ability of the COMESA region to absorb and benefit from spillovers of STFCF. Tables 3.1 and 2.6 show that the region requires a score of 0.61 of government effectiveness to realize a positive growth impact of STFCF and only Mauritius pass this threshold to exploit gains from STFCF more efficiently.

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91 (STFCF*VOA) is an interaction term aimed at measuring the effect voice and accountability institutional quality is likely to have on the absorptive capability of the short term foreign capital flows to the COMESA region.

92 (STFCF*POSTAB) is an interaction term aimed at measuring the effect political stability is likely to have on the absorptive capability of the short term foreign capital flows to the COMESA region.

93 (STFCF*GOVEF) is an interaction term meant to capture the effect government effectiveness is likely to have on the absorptive capability of the short term foreign capital flows to the COMESA region.
The interaction term between the STFCF and regulatory quality exhibits a positive and statistically significant coefficient at the 5 percent level of significance, suggesting that improvement in the quality of regulations enhances the ability of the region to absorb and benefit from spillovers of STFCF. This result also suggests that the region requires a score of 0.00 of regulatory quality for STFCF to contribute positively to GDP per capita growth. The results presented in Table 2.6 show that only Mauritius satisfy this threshold to benefit from STFCF more efficiently.

The results of the interaction term (STFCF*RULAW) has a positive and statistically significant coefficient at 5 percent level of significance, implying that improvement in the institutional quality of the rule of law has a positive effect on the growth impact of STFCF. The results presented in Tables 3.1 and 2.6 show that the region requires a score of 0.00 of rule of law to realize a positive growth impact of STFCF and only Mauritius and Seychelles pass this turning point to benefit from STFCF more efficiently.

Results in Table 3.1 show that the interaction term between the STFCF and control of corruption has a positive and statistically significant coefficient at 5 percent level of significance, suggesting that corruption hampers STFCF inflows as it results into an extra cost and creates uncertainty, which deters the flow of STFCF. Tables 3.1 and 2.6 show that the region requires a score of 0.00 of control of corruption to realize a positive growth impact of STFCF and only Mauritius and Seychelles pass this break-even point to exploit benefits of STFCF more efficiently.

The interaction terms between STFCF and human capital, Openness of the economy, financial sector development and infrastructure are positive but statistically not significant. The calculated threshold for these variables are infinite (that is, $\infty$), thus improvement in these absorptive capacity

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94 (STFCF*REGQUA) is an interaction term purposed to capture the effect regulatory quality is likely to have on the absorptive capability of the short term foreign capital flows to the COMESA region.

95 (STFCF*RULAW) is an interaction term aimed at capturing the effect quality of the institutions of rule of law and order is likely to have on the absorptive capability of the short term foreign capital flows into the COMESA region.

96 (STFCF*COC) is an interaction term aimed at capturing the effect the quality of the institution of control of corruption is likely to have on the absorptive capability of the short term foreign capital flows into the COMESA region.
factors does not produce a threshold over which short-term foreign capital flows has a positive effect on the GDP per capita growth for COMESA region.

3.6.3 The Impact of Cross-Border Bank Lending on Economic Growth in the COMESA Region

Table 3.1 show a positive and statistically significant parameter on the cross-border bank lending, concurring with Macias and Massa (2009) who argued that increased cross-border bank lending allow the banks to optimize their size, harness economies of scope and scale, allocate and diversify capital among investment opportunities, share and manage risks better, spread revenues and enhance profitability. Increased cross-border bank lending represents improved financial integration. Consequently, the integration of the banking sector is likely to have a positive impact on economic growth. Compared to the rest of the financial resources and FDI, cross-border bank lending, with a coefficient of 0.893, has the largest single effect on the GDP per capita growth in the COMESA region.

The results are also supported by Mallick and Moore (2005) who theorized that bank lending foster GDP per capita growth in receiving countries by enhancing infrastructural investment in physical and social capital, raising the expected returns on investment and crowding in extra investments in the private sector through bank participation in investment projects via lending activities, and encouraging structural and policy reforms associated with economic efficiency and GDP per capita growth. The results further concur with Gruben and McLeod (1998) who found that bank lending has a significant and positive impact on GDP per capita growth. The findings are however contrary to Durham (2003) and Reisen and Soto (2001) who established that cross-border bank lending impacts negatively on GDP per capita growth in the host countries.

The results in Table 3.1 show a positive and statistically significant parameter of the interacted term (LOANS*TOPEN)\textsuperscript{97} at the 5 percent level of significance, implying that improved Openness of the economies of the COMESA region through trade liberalization and implementation of export-promotion strategies has a positive effect on the growth impact of cross-border bank

\textsuperscript{97}(LOANS*TOPEN) is an interaction term aimed at capturing the effect of a more TOPEN economy is likely to have on the absorptive capacity of the inflow of cross-border bank lending into the COMESA region.
lending. Further, the threshold of degree of Openness of the economy is equal to 37.5% of total trade to GDP. Table 2.6 show that except Sudan, the rest of the COMESA countries satisfy this threshold required to ensure that they benefit more efficiently from the positive growth impact of cross-border bank lending over the average of the sixteen covered by the study.

The parameter of the interaction term of LOANS with the capital account openness, (LOANS*KAOPEN)\(^98\), is significant and positive. This result suggests that a positive threshold of capital account openness is required for FDI to contribute positively to economic growth. The results presented in column five of Table 3.1 and column four of Table 2.6 show that only Djibouti, Ethiopia, Malawi, Rwanda, Swaziland and Uganda will positively benefit from attracting FDI more efficiently when the capital account liberalization is above 0.00.

The results in Table 3.1 show that the parameter of the interaction term between the access to credit by private sector and cross-border bank lending\(^99\) is negative and statistically significant at 1 percent level of significance. This result suggests that 27.0% of technological gap is required for LOANS to contribute positively to GDP per capita growth. The results presented in Table 2.6 proves that only DR Congo, Egypt, Kenya, Libya, Mauritius, Seychelles, Sudan, Swaziland and Zambia are able to exploit the positive impact of LOANS on growth more efficiently when the technology gap level is below this threshold.

The positive and statistically significant coefficient of the interaction term (LOANS*INFR)\(^{100}\) suggests that development of quality infrastructure has a positive effect on the growth impact of cross-border bank lending. Further, Tables 3.1 and 2.6 show that the region requires a score of 0.00 of infrastructure to realize a positive growth impact of LOANS and all COMESA countries pass this turning point to exploit gains from LOANS more efficiently.

\(^{98}\) (LOANS*KAOPEN) is an interaction term aimed at measuring the effect capital account liberalization is likely to have on the absorptive capability of the cross-border bank lending flows to the COMESA region.

\(^{99}\) (LOANS*FSD) is an interaction term purposed to capture the effect financial sector development is likely to have on the absorptive capability of the cross-border bank lending inflows into the COMESA region.

\(^{100}\) (LOANS*INFR) is an interaction term purposed to measure the effect development of high quality infrastructure is likely to have on the absorptive capability of the cross-border bank lending flows to the COMESA region.
The coefficient of the interaction term between LOANS and technology gap\(^{101}\) is significant and negatively related to GDP per capita growth rate. This result suggests that 36.5\% of technological gap is required for LOANS to contribute positively to GDP per capita growth. Further, Table 2.6 proves that only Comoros, DR Congo, Egypt, Kenya, Libya, Madagascar, Mauritius, Seychelles, Sudan, Swaziland, Uganda, Zambia and Zimbabwe are able to exploit the positive impact of LOANS on growth more efficiently when the technology gap level is below this threshold.

The positive and statistically significant parameter of the interaction term between LOANS and voice and accountability variable (LOANS*VOA)\(^{102}\), suggests that improvement in the quality of voice and accountability governance institutions has a positive effect on the growth impact of LOANS. Further, the results show that the region requires a score of 0.95 of VOA institutional quality so as to grow the economy from LOANS. Table 2.6 show that none of the COMESA countries pass this threshold.

Table 3.1 shows that parameter of the interaction term between LOANS and political stability variable (LOANS*POSTAB)\(^{103}\) is positive and statistically significant at 5 percent level of significance, suggesting that peace and political stability has a positive effect on the growth impact of cross-border bank lending. The results also show that the region requires a score of 0.72 of political stability to realize positive growth from LOANS and Table 2.6 show that only Mauritius and Seychelles satisfy the required threshold of political stability and can benefit more efficiently from LOANS over the average of the 2000-2015 period.

The coefficient of the interaction term (LOANS*GOVEF)\(^{104}\) is positive and statistically significant at 1 percent level of significance, suggesting that effective and efficient delivery of public and civil

\(^{101}\) (LOANS*TG) is an interaction term aimed at measuring the effect technology gap is likely to have on the absorptive capability of the cross-border bank lending flows to the COMESA region.

\(^{102}\) (LOANS*VOA) is an interaction term aimed at measuring the effect voice and accountability institutional quality is likely to have on the absorptive capability of the cross-border bank lending flows to the COMESA region.

\(^{103}\) (LOANS*POSTAB) is an interaction term aimed at measuring the effect political stability is likely to have on the absorptive capability of the cross-border bank lending flows to the COMESA region.

\(^{104}\) (LOANS*GOVEF) is an interaction term meant to capture the effect government effectiveness is likely to have on the absorptive capability of the cross-border bank lending flows to the COMESA region.
services enhance the ability of the COMESA region to absorb and benefit from LOANS spillovers. Results also suggest that government effectiveness may also reduce the costs of doing business for borrowers. Tables 3.1 and 2.6 show that the region requires a score of 0.93 of government effectiveness for the region to realize positive growth impact of LOANS but none of the COMESA countries pass this turning point.

The results show that the interaction term between the regulation quality and the cross-border bank lending and regulatory quality (LOANS*REGQUA)\textsuperscript{105} exhibit a positive and statistically significant coefficient at 1 percent level of significance. This result suggests that improvement in the regulatory quality has a positive effect on the growth impact of LOANS in the COMESA region. The results is however contrary to Durham (2003). The result further suggests that a score of 0.74 of regulatory quality is required for cross-border bank lending to contribute positively to economic growth. However, Table 2.6 show that all the economies in the COMESA region do not pass this break-even point.

The interaction term of the cross-border bank lending with the proxy of the quality of the institutions of rule of law and order (lnLOANS*RULAW)\textsuperscript{106} has a positive and statistically significant coefficient at 1 percent level of significance, contrary to Durham (2003). Further, a threshold of 0.52 of the institutional quality of the rule of law is required for the region to positively benefit from cross-border bank lending. The study sample results presented in Table 2.6 show that only Mauritius achieve more than the estimated minimum threshold to exploit the benefits of LOANS more efficiently.

The (LOANS*COC)\textsuperscript{107} has a positive and statistically significant parameter at 5 percent level of significance, implying that low prevalence of corruption and graft has a positive effect on the growth impact of cross-border bank lending. The calculated threshold score of 0.58 of institutional

\textsuperscript{105} (LOANS*REGQUA) is an interaction term aimed at measuring the effect regulatory quality is likely to have on the absorptive capability of the cross-border bank lending flows to the COMESA region.

\textsuperscript{106} (LOANS*RULAW) is an interaction term aimed at capturing the effect quality of the institutions of rule of law and order is likely to have on the absorptive capability of the cross-border bank lending flows into the COMESA region.

\textsuperscript{107} (LOANS*COC) is an interaction term purposed to measure the effect quality of the institution of control of corruption is likely to have on the absorptive capability of the cross-border bank lending flows into the COMESA region.
quality of control of corruption is required for the region to realize a positive growth from LOANS. The sample results reported in Table 2.6 show that none of the COMESA countries pass this threshold.

Finally, the interaction term between cross-border bank lending and human capital is positive but statistically not significant. The calculated threshold of human capital variables is infinite (that is, $\infty$), thus improvement in the development of human capital does not produce a threshold over which cross-border bank lending has a positive effect on the GDP per capita growth for COMESA region.

### 3.6.4 The Impact of ODA and Aid on Economic Growth in the COMESA Region

Results also suggest that overseas development assistance and official aid positively contribute to growth of the GDP per capita. This finding concurs with Alemu and Lee (2015), Ali (2012), Rahnama et al. (2017), Hatemi-J and Irandoust (2005) who argued that aid has favourable effects on real income by complementing domestic savings and Karras (2006) who revealed that the impact of international aid on GDP per capita growth is positive, permanent, significant and sizable. The result further concurs with Gomanee et al. (2002), Morrissey (2001) and Burnside and Dollar (2000) who argued that foreign development assistance and aid promote GDP per capita growth through their positive effect on policy reforms, investments or savings.

The parameter of the interaction term between the overseas development assistance, aid and human capital development (ODAAID*HUMCAP) \(^{108}\) is positive and statistically significant at 5 percent level of significance, confirming the past findings by Blomström and Kokko (2003), Morrissey (2001) and Van den Berg (2001) who pointed out that labour force described by human capital and education is required to absorb and adapt technology associated with foreign aid and grow the productivity of capital, foster endogenous technological progress and to generate sustainable long-run GDP per capita growth. The finding also suggests that a minimum score of 0.71 of Human Development Index is required for ODA and aid to contribute positively to economic growth in the COMESA region. After taking the average value of the HDI in each country over the 2000-

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\(^{108}\) (ODAAID*HUMCAP) is an interaction term aimed at capturing the effect of a well-developed human capital is likely to have on the absorptive capacity of the flow of overseas development assistance and aid to the COMESA region.
2015 period, Table 2.6 show that only Libya and Seychelles satisfy this turning point required to exploit the benefits of growth impact of ODA and aid in a more efficient manner.

The interaction term \((\text{ODAAID}^*\text{TOPEN})\)\(^{109}\) has a positive sign and is statistically significant at 10 percent level of significance, suggesting that trade liberalization and implementation of export-oriented strategies enhances the ability of the COMESA region to absorb and benefit from the spillovers of overseas development assistance and aid. This result confirms findings by previous studies by Burnside and Dollar (2000), Morrissey (2001), Rahnana et al. (2017) and Sakyi (2010) who argued that sound trade policies, liberalization and increasing the capacity to import capital goods and technology have a positive effect on the impact of foreign aid on domestic economic growth. Moreover, Tables 3.1 and 2.6 show that a threshold of degree of trade openness required is 44.6% of total trade to GDP for the region to realize a positive growth from ODA and aid and only Comoros, Djibouti, DR Congo, Egypt, Eritrea, Kenya, Libya, Madagascar, Malawi, Mauritius, Seychelles, Swaziland, Zambia and Zimbabwe satisfy this turning point required to ensure that the region positively benefits from ODA and aid in a more efficient manner.

The results presented in Table 3.1 show that the interaction term between the ODA, aid and financial sector development proxy \((\text{ODAAID}^*\text{FSD})\)\(^{110}\) has a positive and statistically significant coefficient at 10 percent level of significance, confirming previous findings by Alfaro et al. (2004), Burnside and Dollar (2000), Durham (2004) and Hermes and Lensink (2003). These authors argued that developed local financial system promotes the diffusion of technology process linked with FDI determines the degree of technology spillovers that accompany aid flows into host countries. The results suggest that greater access to credit to private sector enhances the ability of the region to absorb and grow its economy from ODA and aid. Further, Tables 3.1 and 2.6 show that the region requires a turning point of 44.8% of access to credit to private sector to GDP to realize a positive growth impact of ODA and aid and only Mauritius satisfy this threshold to exploit the benefits of ODA and aid more efficiently.

\(^{109}\)(\text{ODAAID}^*\text{TOPEN})\) is an interaction term aimed at capturing the effect of a more trade openness is likely to have on the absorptive capacity of the inflow of overseas development assistance and official aid into the COMESA region.

\(^{110}\)(\text{ODAAID}^*\text{FSD})\) is an interaction term aimed at measuring the effect of financial sector development is likely to have on the absorptive capability of the overseas development assistance and official aid flows to the COMESA region.
The positive and statistically significant coefficient of the interaction term (ODAAID*INFR)\(^{111}\) suggests that development of quality infrastructure has a positive effect on the growth impact of ODA and aid. This result suggests that improvement in the development of quality infrastructure enhances the ability of the COMESA region to absorb and benefit from ODA and aid and grow the economy. It also confirms the hypothesis that the relationship between ODA, aid and GDP per capita growth is contingent on the development of quality infrastructure, suggesting that the host country must reach a certain level of development of quality infrastructure in order to positively benefit from ODA and aid. Moreover, Tables 3.1 and 2.6 show that the region requires a score of 3.68 of infrastructure to realize a positive growth impact of ODA and aid and only Mauritius pass this turning point to exploit gains from ODA and aid more efficiently.

The parameter of the interaction term between ODA, aid and voice and accountability variable (ODAAID*VOA)\(^{112}\) is positive and statistically significant, suggesting that improvement in the quality of voice and accountability governance institutions has a positive effect on the growth impact of ODA and aid. Moreover, the region requires a score of 0.55 of VOA institutional quality so as to grow the economy from ODA and aid. Table 2.6 show that only Mauritius pass this threshold to exploit the benefits of ODA and aid more efficiently.

The coefficient of the interaction term (ODAAID*GOVEF)\(^{113}\) is positive and statistically significant at 1 percent level of significance, suggesting that effective and efficient delivery of public and civil services enhance the ability of the COMESA region to absorb and benefit from spillovers of ODA and aid. Tables 3.1 and 2.6 show that the region requires a score of 0.79 of government effectiveness for the region to realize a positive impact on growth from ODA and aid but none of the COMESA countries satisfy this threshold to exploit the benefits of ODA and aid more efficiently.

\(^{111}\) (ODAAID*INFR) is an interaction term purposed to measure the effect development of high quality infrastructure is likely to have on the absorptive capability of the ODA and aid flows to the COMESA region.

\(^{112}\) (ODAAID*VOA) is an interaction term aimed at measuring the effect voice and accountability institutional quality is likely to have on the absorptive capability of the ODA and aid flows to the COMESA region.

\(^{113}\) (ODAAID*GOVEF) is an interaction term meant to capture the effect government effectiveness is likely to have on the absorptive capability of the ODA and aid flows to the COMESA region.
The results show that the interaction term between ODA, aid and the regulatory quality variable (ODAAID*REGQUA), obtains a positive and statistically significant parameter at 1 percent level of significance. The finding concurs with Burnside and Dollar (2000) and Feeny and McGillivray (2008) who found that effectiveness of aid is dependent on the quality of institutions: the higher the institutional quality, the bigger the impact of aid on GDP per capita growth. The results also show that a score of 0.48 of regulatory quality is required for the region to realize a positive growth from ODA and aid. Table 2.6 show that only Mauritius reached this break-even point and can exploit the gains of ODA and aid more efficiently.

The interaction term (ODAAID*RULAW) has a positive and statistically significant parameter at 5 percent level of significance, suggesting that improvement in the quality of the rule of law has a significant positive impact on the GDP per capita growth in the COMESA region through interaction with ODA and aid. The calculated threshold for the score institutional quality of rule of law is given by 0.68, thus practically any improvement in the institutional quality of rule of law above this threshold would result into a positive growth effect of ODA and aid. However, the results presented in Table 2.6 show that only Mauritius pass this threshold and can exploit the benefits of ODA and aid more efficiently.

The positive but insignificant interaction terms between ODA, aid and technology gap, political stability and control of corruption are positive but statistically not significant. The calculated threshold for these variables are infinite (that is, ∞), implying that improvement in these absorptive capacity factors does not produce a threshold over which ODA and aid flows have a positive effect on the GDP per capita growth for COMESA region.

3.6.5 The Impact of Remittances on Economic Growth in the COMESA Region

The parameter of the remittances on the GDP per capita growth is positive and statistically significant at usual levels of significance, confirming previous findings by Faini (2002), Gadzar

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114 (ODAAID*REGQUA) is an interaction term purposed to capture the effect regulatory quality is likely to have on the absorptive capability of the ODA and aid flows to the COMESA region.

115 (ODAAID*RULAW) is an interaction term meant to capture the effect the quality of the institution of rule of law and order is likely to have on the absorptive capability of the ODA and aid flows to the COMESA region.
and Kratou (2017), Matuzeviciute and Butkus (2016), Meyer and Shera (2017), Nyamongo (2012), Stark and Lucas (1988) and Taylor (1992) who found a positive association between remittances and GDP per capita growth. The results are consistent with the argument that remittances foster GDP per capita growth via their positive effect on savings, consumption or investment. Remittances promote GDP per capita growth by providing additional foreign exchange that can be used to finance private investment (Amuedo-Dorantes & Pozo, 2006; Woodruff & Zenteno, 2007), accelerate investments (Lucas, 2005) and impact positively on incomes, employment and productivity (Glytsos, 2002; Leon-Ledesma & Piracha, 2004).

The coefficient of the interaction term between the remittances and human capital development (REMIT*HUMCAP)\(^{116}\) is positive and statistically significant at 5 percent level of significance, confirming previous findings by Edwards and Ureta (2003), Gitter and Barham (2007) and Yang (2004). This finding suggests that improvement in the life expectancy, being knowledgeable and having a decent standard of living enhance the ability of the region to absorb and benefit from growth impact of remittances. The finding also suggests that a minimum score of 0.83 of Human Development Index is required for remittances to contribute positively to GDP per capita growth in the COMESA region. After taking the average value of the HDI in each country for the period from 2000 to 2015, the Table 2.6 show that all the nineteen COMESA countries do not satisfy this turning point required to exploit the benefits of growth impact of remittances in a more efficient manner over the average of the sixteen years of study.

The interaction term (REMIT*INFR)\(^{117}\) has a positive and statistically significant coefficient, suggesting that development of quality infrastructure has a positive effect on the growth impact of remittances. Further, Tables 3.1 and 2.6 show that the region requires a score of 1.92 of infrastructure to realize a positive growth impact of REMIT and except Comoros, the rest of the COMESA countries pass this break-even point to exploit gains from REMIT more efficiently.

\(^{116}\) (REMIT*HUMCAP) is an interaction term aimed at capturing the effect of a well-developed human capital is likely to have on the absorptive capacity of the inflow of remittances flows to the COMESA region.

\(^{117}\) (REMIT*INFRA) is an interaction term purposed to measure the effect development of high quality infrastructure is likely to have on the absorptive capability of the remittances flows to the COMESA region.
The coefficient of the interaction term between REMIT and technology gap\textsuperscript{118} is significant and negatively related to GDP per capita growth rate. This result suggests that 23.5\% of technological gap is required for REMIT to contribute positively to GDP per capita growth. Further, Table 2.6 proves that only DR Congo, Egypt, Kenya, Libya, Mauritius, Seychelles, Sudan, Swaziland, Zambia and Zimbabwe are able to exploit the positive impact of REMIT on growth more efficiently when the technology gap level is below this threshold.

The interaction term (REMIT*REGQUA)\textsuperscript{119} exhibit a positive and statistically significant coefficient at 5 percent level of significance, confirming previous findings by Catrinescu et al. (2009) who argued that regulatory quality generate incentives for financial, savings and business investment from remittances and Hall and Jones (1999) and Rodrik et al. (2002) who argued that quality of institutions is an important mechanism through which the host nations benefit from migrant remittances. The result further suggests that a score of 0.98 of regulatory quality is required for remittances to contribute positively to economic growth. However, Table 2.6 show that all the economies in the COMESA region do not pass this break-even point.

Moreover, the parameter of the interaction term of the remittances with the proxy of the institutional quality of the rule of law (REMIT*RULAW)\textsuperscript{120} is positive and statistically significant at 5 percent level of significance, concurring with Catrinescu et al. (2009), Hall and Jones (1999) and Rodrik et al. (2002. Further, a score of 0.92 of the institutional quality of rule of law is required for the region to positively benefit from remittances. Additionally, the study sample reported in Table 2.6 show that all the COMESA countries do not achieve this minimum required threshold to be able to exploit the positive impact of remittances on GDP per capita growth more efficiently.

\textsuperscript{118} (REMIT*TG) is an interaction term aimed at measuring the effect technology gap is likely to have on the absorptive capability of the remittances flows to the COMESA region.

\textsuperscript{119} (REMIT*REGQUA) is an interaction term aimed at measuring the effect regulatory quality is likely to have on the absorptive capability of the remittances flows to the COMESA region.

\textsuperscript{120} (REMIT*RULAW) is an interaction term to capture the effect of quality of the institution of rule of law and order is likely to have on the absorptive capability of the remittances flows to the COMESA region.
The \((\text{REMIT}^*\text{COC})\)^{121} has a positive and statistically significant coefficient at 5 percent level of significance, implying that low prevalence of corruption and graft has a positive effect on the growth impact of remittances. The result contradicts Catrinescu et al. (2009), Hall and Jones (1999) and Rodrik et al. (2002). Further, the calculated threshold score of 0.99 of institutional quality of control of corruption is required for the region to realize a positive growth from remittances. The sample results reported in Table 2.6 show that none of the COMESA countries pass this threshold and therefore they cannot exploit the positive impact of remittances on GDP per capita growth more efficiently.

The interaction terms between remittances and Openness of the economy, financial sector development, voice and accountability, political stability, government effectiveness are positive but statistically not significant. The calculated threshold for these variables are infinite (that is, \(\infty\)), thus improvement in these absorptive capacity factors does not produce a threshold over which remittances flows has a positive effect on the GDP per capita growth for COMESA region.

### 3.7 Summary, Conclusion and Policy Recommendations

This study has analyzed the relative impact of FDI, short-term foreign capital flows, cross-border bank lending, ODA, aid and remittances on the GDP per capita growth in the COMESA region over the period 2000-2015. To accomplish this, the study estimated a dynamic panel data GDP per capita growth model using the one-step GMM-difference estimator proposed by Arellano and Bond (1991).

There are four key conclusions drawn from this study. First, the study confirmed conditional but not absolute convergence. Second, FDI have a negative, while short-term foreign capital flows, cross-border bank lending, ODA, aid and remittances exert a positive direct impact on GDP per capita growth in the COMESA region. Moreover, while the cross-border bank lending exerts the largest single impact on GDP per capita growth (89.3%) and ODA and foreign aid has the least impact (23.6%). FDI’s impact is given by negative 57.5% while short term foreign capital flows is 68% and REMIT is 85.8%.

\(^{121}\) (\(\text{REMIT}^*\text{COC}\)) is an interaction term purposed to measure the effect quality of the institution of control of corruption is likely to have on the absorptive capability of the remittances flows to the COMESA region.
Third, the growth impact of disaggregated foreign capital and financial resources is contingent on the absorptive capacity and the region can realize a positive growth from disaggregated foreign capital and financial resources if the absorptive capacity factors reach certain thresholds. Fourth, development of human capital, improvement in access to credit to private sector, development of quality infrastructure, stable political environment and low prevalence of corruption and graft, have a positive direct impact on the growth of GDP per capita, while wide technology gap has a negative effect.

Fifth, the past values of GDP per capita growth rate, domestic investment exert a positive direct impact on the GDP per capita growth rate, while public debt and inflation negative impact. Sixth, the interaction term between cross-border bank lending and government effectiveness has the largest coefficient, given by 0.964, consequently it has the most important single effect on GDP per capita growth in the COMESA region.

Based on the findings of the study, there is need to analyze the various types of FDI flowing into the COMESA and establish why the FDI has a negative growth impact. The countries of the region should target to attract FDI which complements economic growth such as investment in manufacturing sector, scientific industries and industries with higher skill requirements and those that are heavily reliant on external capital. This recommendation is also supported by UNCTAD (2001), Kathuria (2000) and Alfaro and Charlton (2007), respectively. FDI targeting involves screening of investment applications and granting differential incentives to different corporations or allowing repatriation of profits only out of net foreign exchange earnings (Agosin and Mayer, 2000; Keshava, 2008; Mwilima, 2003). Policy makers should therefore emphasize on promotional resources to lure some forms of FDI and regulate others.122

122Empirical evidence has shown the FDI has been more productive in Asia in general and China, Taiwan and South Korea in particular, than all the regions of the developing world because of the targeted approach, which involved screening of investment applications and granting differential incentives to different corporations (Agosin & Mayer, 2000; Mwillima, 2003). Additionally, China, for instance, allows repatriation of profits only out of net foreign exchange earnings (Keshava, 2008).
The countries of the region should strive to lower the costs of receiving remittances, remove barriers to entry to the remittances market, introduce efficient technology systems and install tax or schemes of exemption so as to redirect the application of remittances to more productive sectors of the economy. Further, they should encourage increased inflow of quality foreign financial resources and improve on the absorptive capacity in order to realize a positive GDP per capita growth from them.

Finally, the countries of the COMESA region should develop human capital; improve access to credit to private sector; quality development infrastructure; lower the technology gap between the host countries and the technology leaders such as the USA; improve on the quality institutional and governance environment so as to directly grow their GDP per capita and boost the relative growth impact of the disaggregated foreign capital and financial resources in the region.

The next chapter presents the analysis of the effect of applying various panel data regression methods to generate estimates of the impact of aggregated and disaggregated foreign capital and financial resources on the GDP per capita growth as well as the effect of absorptive capacity factors in influencing the ability of the COMESA region to absorb and benefit from spillovers of the foreign capital and financial resources.
CHAPTER FOUR: EFFECT OF ESTIMATION TECHNIQUE ON REGRESSION RESULTS

4.0 Introduction

This chapter investigates the effect of applying different methods to estimate the impact of aggregated and disaggregated foreign capital and financial resources on the GDP per capita growth in nineteen COMESA countries and establish the effect of absorptive capacity factors on the said growth impact. The study uses panel data covering the period from 2000 to 2015.

Panel data sets are richer in data with greater variability and less collinearity among the variables than is typical of time-series or cross-sectional data, able to control for individual heterogeneity and effects of missing variables and to study complex issues of dynamic behavior among other benefits (Baltagi, 1998; Hsiao, Mountain & Ho-Illman, 1995; Hsiao, 2006; Pakes & Griliches, 1984). However, they are wrought with problems such as incomplete coverage of the population of interest, non-response and failure to recall correctly by respondents and distortions due to measurement errors that may arise due to unclear questions, memory errors, missed recording of responses. Panel data sets may also exhibit bias due to sample selection problems. Other benefits and limitations of using panel data sets are listed in Baltagi (1998) and Hsiao (2006).

Panel data sets are estimated using either static regression models using pooled ordinary least squares (POLs), fixed effects (FE) and random effects (RE) techniques or the dynamic panel data regression models (DPD). The DPD modelling involves the use of a dynamic effect, in this case adding a lagged dependent variable to the explanatory variables. The DPD modeling has a theoretical appeal as it is modeling a partial adjustment process, where the parameter on the lagged dependent variable, in this case GDP per capita, measures the adjustment speed (that is, one (1) minus parameter is the adjustment speed). Also, the introduction of the lagged dependent variable may eliminate any autocorrelation. This chapter adopts the dynamic modeling technique as it is argued that the lagged GDP growth has an impact on the current GDP growth.

This chapter assesses the effects of employing pooled ordinary least squares (POLs), fixed effects and one-step GMM-system and -difference estimators to investigate the growth impact of aggregated and disaggregated foreign capital and financial resources and how the absorptive
capacity enhances the ability of the COMESA region to absorb and benefit from aggregated and disaggregated foreign capital and financial resources. This is therefore a sensitivity analysis of the results of the study. It confirms the robustness of some of the findings in the chapters two and three.

The chapter examines the following specific research question: What is the effect of applying different estimators to determine the impact of the aggregated and disaggregated foreign capital and financial resources on the GDP per capita growth in the COMESA region?

The chapter contributes to the existing literature by analyzing the effects of generating estimates of the impact of aggregated and disaggregated foreign capital and financial resources on the GDP per capita using various panel data regression techniques. It also makes a contribution to this debate by presenting a deeper insight into the effects of various estimators on the aggregated and disaggregated foreign capital and financial resources-growth nexus. This deeper insight is required as most of the previous empirical studies periscope on one estimation technique at a time. This chapter specifically examines the effect of applying POLS, FE, one-step GMM-system and difference techniques to generate estimates on the aggregated and disaggregated foreign capital and financial resources-growth association. Finally, the chapter also contributes to the existing literature by utilizing panel data analysis, which is a very rich data set and a valuable resource for using macroeconomic data to come up with empirical solutions and policy implications.

The rest of this chapter is organized as follows: Section 4.1 describes panel data models and estimation techniques used to generate results. The section also reviews the econometric challenges faced and appropriate solutions applied to overcome them. An overview of estimators is also presented in this section. Section 4.2 gives an account of the methodology used in the chapter. The section explains the types and sources of data, describes the theoretical framework, specifies the empirical model estimated and explains the estimation variables used in the chapter. Section 4.3 describes the data analysis and the estimation techniques used in the chapter. Section 4.4 presents the summary statistics and correlation of the variables. Section 4.5 presents the empirical results. Section 4.6 is the summary, conclusion and policy recommendations of this study.
4.1 Panel Data Estimation, Challenges and Solutions

The panel data models are either static or dynamic. On one hand, static panel data models are the ones that do not incorporate the lagged dependent variable as a regressor. On the other hand, dynamic panel data (DPD) models include the lagged dependent variable as a regressor.

The nature of the panel data models determines the choice of the appropriate estimator. Static models can be estimated using pooled ordinary least squares (POLS), fixed or random effects methods. The POLS is usually carried out on time-series cross-sectional data, that is, data that has observations over time for several different entities or cross-sections. This approach is applied when the groups to be pooled are relatively similar or homogenous. Level differences can be removed by mean-centering (similar to within-effects technique) the data across the groups (subtracting the mean or average of each group from observations for the group). The model can be directly run utilizing ordinary least squares on the concatenated or a series of interconnected groups. If the model yields large standard errors, this could be a warning flag that the groups are not all that homogenous and a more advanced approach like Random effects model may be more appropriate.

Fixed effects methods are used to measure differences in intercepts for each group (calculated using a separate dummy variable for each group). The approach is also called least squares dummy variable (LSDV) method for this reason. This is basically an OLS model with dummy variables to control for group differences, assuming constant slopes (coefficients) for independent variables and constant variance across groups. The within-effects technique avoids using dummies by mean-centering all modeled variables, including the dependent, thus increasing degrees of freedom.

Random effects approach leverages the differences in the variance of the error term to model groups together, assuming constant intercept and slopes. Compared to Fixed Effects Models, Random Effects Models are more complex to estimate. Additionally, there is also the Random Parameters (Coefficients) method. This technique is similar to the Random Effects technique except that it allows slopes and intercepts to vary across cross-sections or groups, assuming they are normally distributed around a mean. If they are not normally distributed a Hierarchical Bayes'
approach can be used to estimate distribution-independent parameters by sampling from posterior probabilities.

The dynamic panel data models are best estimated using instrument variable techniques, generalized method of moments (GMM) techniques among others. The GMM estimators are particularly known to be consistent, asymptotically normal, and efficient in the class of all estimators that do not use any extra information aside from that contained in the moment conditions. They can also be estimated using a Panel Vector Auto-regression (VAR) method. The conventional VAR model is a reduced form model that estimates a system of equations by using non-contemporaneous lags of each dependent variable in the system, creating a dynamic model. A panel VAR model estimates a VAR across multiple panels or groups by using lags of endogenous and exogenous variables for each group.

The dynamic panel data models however present unique estimation challenges. First, the estimated coefficients arising from the panel specifications may be biased if mis-specification of dynamics results into autocorrelated errors. For example, economic growth may be autocorrelated due to effects of business cycles. This challenge can be resolved by pooling observations from one peak to another peak of the business cycle or take averages of data for 5 or 6 years (Catrinescu et al., 2009). The first option is not plausible as it requires a priori knowledge of features of business cycle for each economy. The second option is however arbitrary. The two options also result into loss of information. Alternatively, these dynamics are modelled by introducing the lagged GDP per capita as an explanatory variable, thus underscoring the appropriateness of using Dynamic Panel Data (DPD) estimators (Catrinescu et al., 2009). This removes autocorrelation but may result in short panel bias problem. Dynamics are usually more convoluted than a single lagged dependent variable making estimation dynamic panel data models difficult. Second, the stationarity of the variables are usually ignored, although given that these models are limited to short time series, this may not be too much of a challenge. Third, the methods for modelling unobserved heterogeneity are limited (Flannery & Hankins, 2012).

However, the main problems of DPD are endogeneity, unobserved heterogeneity and short panel bias. These are discussed in detail in the following sections.
4.1.1 Endogeneity and Unobserved Heterogeneity

In conventional usage, a variable is said to be endogenous if it is determined within the context of the model. However, Wooldridge (2005) shows that an independent variable can be endogenous if it is correlated with the disturbance or error term. Intuitively, endogeneity is defined as a situation where the ceteris paribus condition is not fulfilled whenever the independent variable of interest changes. In order to comprehend the endogeneity concept, we assumed a single equation linear model given by:

\[ Y_{jt} = \pi_t Q_{jt} + \epsilon_{jt} \]

Where \( \pi_t \) are parameters to be estimated with \( i = 0,1,\ldots, n \); \( Y_{jt} \) is the observable dependent random variable which in our case is GDP per capita for country \( j = 1,\ldots, 19 \) at period \( t = 1,\ldots, 16 \); \( Q_{jt} \) are the observable explanatory variables with the main ones being the foreign capital where \( j = 1,\ldots, 19 \) and \( t = 1,\ldots, 16 \); and \( \epsilon_{jt} \) is the unobservable random disturbance term.

The estimation of equation 4.1 using Ordinary Least Squares (OLS) depends on whether the \( E(\epsilon_{jt}) = 0 \) and \( \text{cov}(Q_{jt}, \epsilon_{jt}) = 0 \) meaning that \( Q_{jt} \) and \( \epsilon_{jt} \) are uncorrelated. Thus, if \( E(\epsilon_{jt}) = 0 \) and \( \text{cov}(Q_{jt}, \epsilon_{jt}) = 0 \) holds, then the explanatory variables are exogenous. However, if these axioms are violated (that is, \( Q_{jt} \) and \( \epsilon_{jt} \) are correlated) then endogeneity is present. Wooldridge (2005) argued that endogeneity arises in three possible ways: omitted variable problem, measurement errors and simultaneity. However, the distinction between the three possible sources of bias is not sharp implying that an equation can exhibit more than one source of endogeneity.

Omitted variable bias occurs when controlling for additional variables but because of data unavailability or they are unknown to the researcher, they cannot be included in the regression model. Omitted variables could either be observable or unobservable. When estimating the impact of foreign capital and financial resources on GDP per capita growth rate, estimates may be biased due to omitted observable variable(s) problems caused by factors that determine both GDP per capita as well as the foreign capital and financial resources but are commonly excluded from regression analysis because there is lack of data on them or are unknown to the researcher. These joint determinants may include, for example, changes in economic policy, inflation and political instability, among others.
The omitted unobservable variables bias occurs where it is not possible to gather data on omitted variables that are unobservable to the researcher. In order to illustrate this kind of bias, suppose that $E(Y_{j,t}/Q_{j,t}, Z)$ is the conditional expectation of interest, $Z$ being unobserved, then, if $Z$ and $Y$ are allowed to be correlated, then endogeneity problem is experienced. This bias is usually caused by self-selection and country-specific heterogeneity, among other factors. Self or sample selection arises if the probability that a country is included into the sample and the dependent variable, in this case, GDP per capita growth rate, are both affected by an omitted unobservable variable. The sample is no longer random. For example, suppose that a researcher wishes to establish whether commitment to implementing sound macroeconomic policy by the countries in the COMESA region achieve tangible benefits in the form of high GDP per capita or not. The countries in the COMESA region will decide on implementation of macroeconomic policy based on the expected consequences with regard to their GDP per capita growth rates. It is argued that the factors that determine the choice to implementing sound macroeconomic policy are likely to also affect the dependent variable, the GDP per capita growth rates. Similarly, if a researcher chose to study the countries in the COMESA region that have high population size only, it will induce a sample selection bias in the model. The average characteristics of the sample may differ from that of the population (all the countries in the COMESA region). This may lead to incorrect measure of the impact of the foreign capital and financial resources on the GDP per capita as the impact of these foreign investments and financial resources are confounded with the impact of the parameters that determine selection. However, there is no sampling of countries in this study; all the countries found in the COMESA region are included in the study. Therefore, the sample selection bias does not present a major challenge in our regression analysis.

Unobserved omitted variables also represent features of the country that are given and do not change over the period of the study. Specifically, country characteristics such as the human capital development, institutions and infrastructure can be considered constant over time, especially in the short-run. If these country characteristics impact on both dependent variable and one or more explanatory variables, the disturbance term will be correlated with those explanatory variables. In order to illustrate the unobserved country-specific heterogeneity, two countries that are identical except that one of them has a high level of human capital development, high quality institutions and a high quality of overall infrastructure are considered. The country with a high level of human
capital development, high quality institutions and a high quality of overall infrastructure is likely to attract more of one or more components of foreign capital and financial resources. The country is also likely to realize a higher growth rate of GDP per capita. The GDP per capita and one or more explanatory variables such as foreign capital and financial resources are correlated with the high level of human capital development, high quality institutions and a high quality of overall infrastructure. Country-specific heterogeneity or unobserved omitted variable bias therefore arises when the foreign capital and financial resources are correlated with these important unobserved variables that are omitted from the model. Alternatively, the GDP per capita and one or more components of foreign capital and financial resources may be jointly determined by any of these factors that are unobserved and omitted from the model.

Measurement error is a potential cause of endogeneity. It occurs when one would like to measure the effect of a variable but can observe only an imperfect measure of it. This means that replacing the actual measure by the imperfect measure creates a measurement error. The magnitude of the measurement error depends on the correlation between the actual and imperfect measure such that the closer the correlation, the smaller the error and vice-versa. It can arise due to misreporting. The measurement error can occur on either the dependent or independent variable. Measurement error in the dependent variable, however, does not cause endogeneity, though it does increase the variance of the error term. When one measures the partial effect of an independent variable, but only an imperfect measure of it can be determined partly as a function of the dependent variable, a measurement error is put on the unobserved disturbance term. This means that, if, for instance, the inflows of foreign capital and financial resources are determined partly as a function of GDP per capita growth rate, then the foreign capital and financial resources inflows and the unobserved disturbance are correlated causing endogeneity problem.

Simultaneity is another cause of the endogeneity problem. It takes place when at least one of the explanatory variables, say a component of foreign capital and financial resources, is determined simultaneously along with the explained variable, the GDP per capita growth rate. It is also called reverse causality problem. Reverse causation is a potentially serious source of bias in estimating the impact of foreign capital as it would tend to reduce the estimated effect of foreign investment. If the COMESA region is experiencing higher growth levels, the region may attract higher foreign
capital due to the large market size represented by the high GDP per capita growth rate. At the same time, the high foreign capital attracted to the COMESA may have a positive effect on GDP per capita leading to an expanded size of the market, which in turn leads to attraction of further foreign capital to the region. This situation can cause reverse causality bias. This could occur if a higher economic growth leads to attraction of more foreign capital and, at the same time, more foreign capital contribute to higher growth rates.

On the other hand, the unobserved heterogeneity refers to inter-country differences that cannot be measured in a regression model. In the presence of unobserved heterogeneity even countries with same values of all covariates may have different GDP per capita growth rates. Unobserved heterogeneity describes a situation where some unobserved characteristic (such as a cultural investment beliefs and practices or differences in consumer behavior across countries) is related to both the dependent variable (GDP per capita) and one or more of the independent variables (such as AFCFR, FDI, STFCF, LOANS, ODAAID or REMIT). Unobserved heterogeneity also causes endogeneity bias.

Unobserved heterogeneity may arise in the context of the relationship between the GDP per capita and AFCFR, FDI, STFCF, LOANS, ODAAID or REMIT. If an unobserved variable (such as sound macroeconomic policy) leads to higher GDP per capita and increased foreign capital to the COMESA region, estimated coefficients for the effects of foreign capital on GDP per capita become biased and do not reflect the true underlying effects of flows of foreign capital on growth.

### 4.1.2 Solution of Endogeneity and Unobserved Heterogeneity

The solution to the omitted observable variable bias is to include all factors that are important in explaining the dependent variable and associated with one or more of the explanatory variables, into the equation model. This solution is however implemented subject to knowledge of the factors, availability of data and requirement of degrees of freedom. These factors that are associated with both dependent and some explanatory variables are called joint determinants. Once the joint determinants are included in the equation model, the disturbance term is purged from the source of its correlation with the explanatory variables and the estimation of the parameters of interest is
free from endogeneity. However, this may not resolve endogeneity caused by unobserved omitted variables, measurement errors or simultaneity.

In this study, the omitted observable variable bias is reduced by including as many factors as possible that are associated with both the GDP per capita and foreign capital into the dynamic panel data regression analysis. This required us to conduct a thorough review of the extant theoretical foundations and empirical literature to identify these joint determinants. Consequently, we included factors such as domestic investment, human capital development, trade openness and capital account liberalization, public debt, inflation, aggregated and disaggregated foreign capital and financial resources and absorptive capacity factors in our model specifications. It is important to note that it is impossible to include all factors in a regression estimation model and only a reasonable number is included. The impact of the excluded determinants is captured through the error term. Additionally, we took care to ensure that the degrees of freedom requirement is met and data was available for the chosen variables.

We also applied ad hoc solutions such as lagging the potentially endogenous variable(s) by one or more periods and used proxies to resolve endogeneity problem. It is argued that, although current values of a variable might be endogenous, it is unlikely that past values are subject to the same problem. Proxies are appropriate for resolving endogeneity caused by country-specific heterogeneity and measurement error. This study used proxies such as Human Development Index to measure the level of human capital development. Lags and proxies are very simple to implement, require limited additional data and are intuitively appealing. However, proxies present a difficulty in interpretation since the variable in the regression is only a proxy for the variable we are interested in. They may also result in loss of precision in some cases (especially where the proxy is not a good representative of the variable in question) and they also make it difficult to gauge empirically, how serious the endogeneity problem is and whether the solution is adequate to deal with it (Shepherd, 2009).

The best way to deal with endogeneity problem is through instrumental variables (IV) techniques. IV estimation is intuitively appealing and relatively simple to implement. However, selection of appropriate instruments is a challenge. Arellano and Bond (1991) and Blundell and Bond (1998)

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GMM approaches suggested use of the lagged levels or first differences of those variables as valid instruments, respectively. The fixed effects (FE) method also accounts for country-specific heterogeneity.

In order to overcome endogeneity and unobserved heterogeneity challenges, this study uses Arellano and Bond (1991) technique to estimate a dynamic GDP per capita growth model. However, the results generated by the pooled OLS, fixed effects and GMM-system approaches are also reported for comparability purposes, robustness check and to identify differences associated with application of various estimators.

4.1.3 Short Panel Bias

Unlike general panel data estimators that successfully eliminate the unobservable heterogeneity (that is, the problem of an explanatory variable being correlated with the unobserved entity-specific effect) through fixed effect transformations, application of a similar approach to a dynamic model will generate short panel bias (Nickell, 1981).

In order to illustrate the problem of short panel bias, we write a dynamic panel model given by equation 4.2:

\[ Y_{i,t} = \tau Y_{i,t-1} + \gamma Q_{i,t} + u_i + e_t + u_{i,t} \]

where \( Y \) represents the flow of output; \( Q \) is the vector of explanatory variables; \( e_t \) time-specific effects which are also assumed to be independently and identically distributed over all time periods; \( u_i \) is an unobserved country-specific effects which are independently and identically distributed over all the entities; \( u_{i,t} \) is a normally distributed error term; \( \tau \) is the coefficient for the lagged values of flow of output; and \( \gamma \) is a vector of parameters to be estimated. The subscripts \( i \) and \( t \) represent cross-sectional entities and time period, respectively.

Nerlove (1967), Nickell (1981) and Baltagi (2008) established that ordinary least squares (OLS) estimates of the coefficient of the lagged dependent variable in a dynamic panel model are biased and inconsistent owing to the correlation between the lagged dependent variable and the fixed
effects. Thus, estimating 4.2 via ordinary least squares (OLS) gives inconsistent and biased parameters because application of the OLS estimation technique excludes the fixed effect, \( v_i \).

Similarly, the fixed effect (FE) or the least squares dummy variable estimate controls for the unobserved (time-invariant) heterogeneity, but it also gives biased parameter estimates. Since \( y_{i,t} \) is a function of the fixed effect, the error term is correlated with the lagged dependent variable (Baltagi, 2008).

The within transformation estimation technique eliminates the unobserved (time-invariant) heterogeneity from the model:

\[
Y_{i,t} - \bar{Y}_{i} = \tau(Y_{i,t-1} - \bar{Y}_{i-1}) + \gamma(Q_{i,t} - \bar{Q}) + (u_{i,t} - \bar{u}) + (e_{i,t} - \bar{e}) + (u_{i,t-1} - \bar{u}) \]

but introduces a correlation between the transformed lag \((Y_{i,t-1} - \bar{Y}_{i-1})\) and the transformed error \((u_{i,t-1} - \bar{u})\) because the average error \((\bar{u} = \sum_{t=1}^{T} u_{i,t})\) includes \(u_{i,t-1}\). \(T\) represents the length of the panel. The estimated \(\tau\) therefore remains biased. Further, some of the GMM estimation techniques for dynamic panel models first-difference 4.2 to remove the fixed effects, but the (differenced) lagged dependent variable remains correlated with the differenced residual \((u)\). The bias reduces with increase in panel length because \(u_{i,t-1}\) becomes a smaller part of the mean error term as \(T\) increases.

In other words, with higher \(T\) the correlation between the regression errors and the lagged dependent variable grows smaller. However, there are cases where potentially acute biases remain even with \(T = 30\) (Judson & Owen, 1999). Also, a biased parameter on the lagged dependent variable renders the other parameter estimates suspect. Thus, the short panel bias is a major concern in using dynamic panel models in economic research as resolving it is not easy (Baltagi, 2008; Judson & Owen, 1999; Nerlove, 1967; Nickel, 1981).

### 4.1.4 Solution of Short Panel Bias

A number of econometric techniques such as instrumental variables (IV) estimators, generalized method of moments (GMM) estimators, bias correction formulae and long differencing (LD) among others, have been developed to correct the short panel bias problem.

The instrumental variables (IV) method is reliable, as long as the researcher can identify reliable instruments. The instrument chosen should have a high correlation with the respective explanatory
variable and must be uncorrelated with the error term so as to be reliable (Wooldridge, 2002). This is because any slight correlation between the instrument and the disturbance term would lead to a bias. In practice, it is difficult to find such instruments. Consequently, many researchers opt to use imperfect instruments. The imperfect instruments are either exogenous but having low correlation with the endogenous variable (called weak instruments) or having a high correlation with the endogenous variable, but not exogenous (termed as semi-exogenous or quasi-instruments). However, weak instruments often lead to inefficient and inconsistent estimators. Semi-exogenous instruments, which include lagged values of the endogenous variable(s), are the most popular. However, they may also have the shortcoming of performance whereby, the performance of the instrument in period (t-1) is linked to performance of dependent variable in period (t-1) or the performance of the instrument in period (t-1) is linked to performance of dependent variable in period (t) or both. Nevertheless, though difficult to obtain reliable and valid instruments, researchers should ensure that instruments meet the minimum thresholds as set out in the definition (Woodridge, 2002; Flannery & Hankins, 2012).

In order to overcome the problem of unreliable instruments, generalized method of moments (GMM) methods are used to derive valid instruments. One such GMM technique was suggested by Arellano and Bond (1991) who use a generalized method of moments (GMM) framework to come up with valid instruments. The authors eliminate the time-invariant fixed effect by first-differencing the panel data and then show that the values (levels) of the lagged dependent variables constitute legitimate instruments for the first differenced variable, on condition that the residuals are free from second-order serial correlation. Indeed, Arellano and Bond’s (1991) Monte Carlo simulations, though relatively limited, showed that their difference GMM method outperforms fixed effects (FE) and ordinary least squares (OLS) estimators when the regression residuals are not correlated (Flannery & Hankins, 2012). However, the lagged levels may offer little information about the first-differenced variables especially if they are serially correlated (Arellano & Bover, 1995; Blundell & Bond, 1998).

Another alternative of a technique of generalized method of moments was suggested by Blundell and Bond (1998), the GMM system estimator. According to this technique, in addition to the first-differencing utilized by Arellano Bond (1991), the lagged first differences are also used as
instruments in a non-transformed or levels model equation. Both Arellano and Bond (1991) GMM difference estimator and Blundell and Bond (1998) GMM system estimator can manage endogenous regressors, utilizing the lagged levels or first differences of those variables as valid instruments.

The Arellano and Bond (1991) and Blundell and Bond (1998) instruments are made invalid by presence of second-order autocorrelation (Baltagi, 2008). Consequently, Hahn, Hausman, and Kuersteiner (2007) came up with a long difference instrumental variable estimation method to partly counter this shortcoming. Presuming existence of balanced panels, Hahn et al. (2007) showed that combining longer lagged instrument choices with multi-period differencing can generate less biased estimates than either the Arellano and Bond (1991) or Blundell and Bond (1998) GMM techniques. This derivation supposes balanced panels: each sample entity has equal number of observations. However, since long differencing method is new in the literature, there is no existing empirical or theoretical work that evaluates the performance of long differencing in unbalanced panels: it is untested (Flannery & Hankins, 2012).

The three methods discussed above have zeroed in on developing valid instruments with which to eliminate the correlation between the transformed lagged explained variables and the transformed disturbance term. However, Kiviet (1995) utilized a different technique to compute an explicit, data-dependent correction for the fixed effects bias in short panels. This bias-corrected least squares dummy variable (LSDVC) estimator eliminates an approximated small sample bias from the FE estimator. Further, Judson and Owen (1999) observed that LSDVC outperforms Arellano and Bond (1991) and Blundell and Bond (1998) for balanced panels of any length. Research by Bruno (2005) computed the bias correction for unbalanced dynamic panels, making it possible to include individual firms\textsuperscript{123} that enter and leave the dataset during the study period. LSDVC’s potential demerits include its presumption that the regressors are stringently exogenous (and independent of error term) and the technique requires large computer memory making it difficult to utilize in large datasets.

\textsuperscript{123}In this study, the unit of observation is a country.
4.1.5 Overview of the Estimation Techniques

The panel data set is rich as it has both time and cross-sectional dimensions. Panel data models are structured in either a static or dynamic form. The nature of the panel data models therefore determines the choice of the appropriate estimator. For example, static models are best estimated POLS, FE or RE techniques. However, the dynamic panel models are faced with problems of endogeneity, unobserved heterogeneity and short panel bias. To overcome these problems, dynamic panel data models are estimated using IV, GMM, panel VAR, long-differencing and bias-corrected LSDVC, among other techniques.

This study seeks to explore the effects of applying different estimators to generate regression results. Estimates generated by using POLS, FE and GM-system and -difference estimators are compared and differences established.

4.2 Methodology

This section presents the methodology employed in this chapter. It is divided into four sections. It starts by presenting the theoretical framework which outlines the theoretical basis of the analytical concepts and models used in the study. Founded on the analytical and conceptual frameworks, the empirical model estimated in the study is then specified. Finally, the variables used in the study are explained in this section. The data types and sources used in the study are presented in table 2.2 in the previous chapter two.

The methodology is influenced by the desire to address the econometric problems in cross-country regressions such as endogeneity, unobserved heterogeneity (that is, country and time effects), outliers, dynamics and uncertainty of the model. Consequently, different specifications and estimators are applied, namely pooled ordinary least squares, generalized least squares (Fixed-effects) and generalized method of moments (GMM).

4.2.1 Theoretical Framework

The theoretical framework used to analyze the differences on the results generated by different estimators of a GDP per capita model for analyzing the growth impact of aggregated and disaggregated foreign capital in the COMESA region is constructed on the basis of log linear
Cobb-Douglas production function. The framework is considered suitable for estimation as it includes other important determinants of economic growth, denoted by $W$, absorptive capacity factors, denoted by $Z$, and interaction terms between absorptive capacity factors and aggregated and disaggregated foreign capital and financial resources, $Z*K_F$, following previous studies by Barro (1990), Catrinescu et al. (2009), Choong et al. (2009), Durham (2003) and Elboiashi (2011), among others. It also incorporates the dynamics by including the past values of GDP per capita as an independent variable. The theoretical framework is given by an AR(1) dynamic production function of the form:

$$
\ln Y_{i,t} = \tau + \delta_0 \ln Y_{i,t-1} + \alpha \ln L_{i,t} + \beta \ln K_{D,i,t} + \theta \ln K_{F,i,t} + \gamma \ln W_{i,t} + \lambda \ln Z_{i,t} + \pi (\ln Z*K_F)_{i,t} + \epsilon_t + \nu_i + \varepsilon_{i,t} \ldots 4.4
$$

where $\ln Y_{i,t}$ is the natural logarithm of GDP per capita for country $i$ at period $t$; $\ln Y_{i,t-1}$ is the lagged natural logarithm of the real GDP per capita for country $i$ at period $t-1$; $\ln L$ is the natural logarithm of labour force; $\ln K_D$ represent the natural logarithm of domestic investment; $\ln K_F$ represent the natural logarithm of aggregated or disaggregated foreign capital and financial resources; $\ln W$ is the natural logarithms of a set of other determinants of economic growth including inflation, trade openness, capital account openness and public debt; $Z$ is the natural logarithm of absorptive capacity factors; $(Z*K_F)$ is the interaction terms between the factors of absorptive capacity and aggregated or disaggregated foreign capital and financial resources; $\tau$ is a constant; $\epsilon_t$ time-specific effects which are assumed to be independently and identically distributed over all time periods; $\nu_i$ stands for unobserved country-specific effects which are also presumed to be independently and identically distributed over all the countries, $\varepsilon_{i,t}$ is a normally distributed error term; $\delta_0$ is the coefficient for the natural logarithm of the lagged values of GDP per capita and $\alpha$, $\beta$, $\theta$, $\gamma$, $\lambda$ and $\pi$ are the other parameters to be estimated. The coefficient(s) $\pi$ is interpreted as the instantaneous increase (if signage is positive) in the impact of a disaggregated foreign capital and financial resources on the GDP per capita growth when the absorptive capacity variable improve. The vice-versa also holds true.

Following standard theory, it is expected that $\alpha$, $\beta$, $\theta$, $\gamma$, $\lambda$ and $\pi$ are either negative or positive, subject to the impact of the variables on economic growth. If $\theta$ is positive and $\pi$ is negative, the suitable threshold would be the value of the absorptive capacity measure $(Z)$ that makes the impact
of aggregated and disaggregated foreign capital and financial resources on growth positive. In this case, the precise threshold or break-even point (BEP) is given as follows:

\[ \text{BEP} \geq - \frac{\theta}{\pi} \]

On the other hand, if both \( \theta \) and \( \pi \) are positive (negative), then aggregated or disaggregated foreign capital and financial resources have an obvious positive (negative) real effect. The concept of break-even point is important as it determines the threshold of absorptive capacity factors required to ensure that aggregated or disaggregated foreign capital and financial resources has a positive impact on the per capita GDP in the host economies, in this case, the COMESA region.

4.2.2 Empirical Model Specification

The empirical model used to analyse the impact of aggregated and disaggregated foreign capital and financial resources on the per capita GDP in the COMESA region is given by the following equation.

\[
\ln GDPPC_{i,t} = \tau + \gamma_0 \ln GDPPC_{i,0} + \gamma_1 \ln GDPPC_{i,t-1} + \gamma_2 \ln HUMCAP_{i,t} + \gamma_3 \ln DINV_{i,t} + \gamma_4 \ln OPEN_{i,t} + \gamma_5 \ln PUBDEBT_{i,t} + \gamma_6 \ln INFLA_{i,t} + \gamma_7 \ln ADFCFR_{i,t} + \gamma_8 \ln Abscap_{i,t} + \gamma_9 (ADFCFR^*Abscap)_{i,t} + \epsilon_t + \nu_t \]

where \( \ln \) is the natural logarithm, \( \ln Y_{i,0} \) is the natural logarithm of initial GDP per capita in country \( i \) during period \( t=0 \); \( \ln GDPPC_{i,t} \) is the natural logarithm of GDP per capita; \( \ln GDPPC_{i,t-1} \) is the natural logarithm of the lagged of GDP per capita in country \( i \) during period \( t-1 \); \( HUMCAP \) is the human capital stock; \( \ln DINV \) is the natural logarithm of the domestic investment; \( \ln OPEN \) is trade or capital account openness; \( \ln PUBDEBT \) is the public debt; \( \ln INFLA \) is the changes in annual general level of prices; the term \( \ln ADFCFR \) includes the natural logarithm of the aggregated foreign capital (AFCFR) or the natural logarithms of foreign direct investment (FDI), short-term foreign capital flows (STFCF), cross-border bank lending (LOANS), overseas development assistance and official aid (ODAAID) and remittances received from abroad (REMIT); \( \ln Abscap \) are the natural logarithms of the set of chosen absorptive capacity factors that influence the ability of the COMESA region to absorb and benefit from spillovers of the foreign capital and include the Openness of the economy, level of human capital development, development of high quality
infrastructure, technology gap, financial sector development and quality of institutions of regulations, control of corruption and the rule of law; \( (ADFCFR*Abscap) \) captures the interaction terms of AFCFR, disaggregated foreign capital and financial resources with absorptive capacity factors of the host country and allows for testing the hypothesis that the impact of aggregated and disaggregated foreign capital and financial resources on economic growth is determined by the absorptive capacity of the host country; \( e_t \) is time-specific effects which are also assumed to be independently and identically distributed over all time periods; \( u_i \) stands for unobserved country-specific effects which are independently and identically distributed over the countries in COMESA region; \( u_{it} \) is the error term which is assumed to be independently and identically distributed over all time periods in country \( i \); \( \gamma_1 \) is a parameter reflecting the speed of convergence of GDP per capita growth from one period to the next; \( \tau \) is a constant; and \( \gamma_0, \gamma_2, \gamma_3, \gamma_4, \gamma_5, \gamma_6, \gamma_7, \gamma_8 \) and \( \gamma_9 \) are the other parameters to be estimated. The coefficient(s) \( \gamma_9 \) is interpreted as the marginal rise in the impact of aggregated and disaggregated foreign capital and financial resources on the real GDP per capita growth when the concerned absorptive capacity factor improves. The vice-versa also holds true.

From the model specification in equation 4.6, three possible results can be drawn to assess the effect of the factors of absorptive capacity of member states of the COMESA region in determining the contribution of foreign capital in growth. First, if \( \gamma_7 \) and \( \gamma_9 \) both have a (negative) positive sign in the GDP per capita growth equation 4.6, then aggregated and disaggregated foreign capital and financial resources flows to the region have an unambiguously (negative) positive effect on economic growth. Second, if \( \gamma_7 \) is positive while \( \gamma_9 \) is negative, then aggregated and disaggregated foreign capital and financial resources have a positive growth effect, and this effect diminishes with the improvement in the absorptive factors of the host region. Third, if \( \gamma_7 \) is negative and \( \gamma_9 \) is positive, then this means that the COMESA countries have to attain a certain threshold level (in

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124 The term \( (ADFCFR*Abscap) \) includes \( (AFCFR*Abscap) \), \( (FDI*Abscap) \), \( (STFCF*Abscap) \), \( (LOANS*Abscap) \), \( (ODAAID*Abscap) \) and \( (REMIT*Abscap) \), which are the interaction terms between the factors of absorptive capacity and aggregated foreign capital and financial resources (AFCFR), FDI, short term foreign capital flows (STFCF), cross-border bank lending (LOANS), overseas development assistance and official aid (ODAAID), and remittances (REMIT), respectively. The interactions facilitates for analyses of the effect of absorptive capacity on the GDP per capita growth in the COMESA region.
terms of development of absorptive capacity) for aggregated or disaggregated foreign capital and financial resources to have a positive growth impact in the region.

The threshold of the absorptive capacity of the COMESA countries is computed by finding the partial impact of FDI/financial resources (represented by $ADFCFR$) on growth (GDP per capita growth) as follows: $(\frac{\partial Y_{i,t}}{\partial ADFC}$FR$)= \gamma_7 + \gamma_9$, $Abscap = 0$, then the threshold or break-even-point of COMESA countries’ absorptive capacity is given by:

$\text{(BEP)} = -\frac{\gamma_7}{\gamma_9}$  .......................................................... 4.7

4.2.3 The Variables Used in the Study

In this chapter, the growth impact of initial GDP per capita, previous values of GDP per capita, domestic investment, trade or capital account openness, public debt, inflation, aggregated or disaggregated foreign capital and financial resources, human capital development, financial sector development, technology gap, infrastructure development and development of quality institutions of voice and accountability, political stability, government effectiveness, regulations, rule of law and control of corruption, are explored. These factors are chosen because they are relevant and important in defining the absorptive capacity of foreign capital in the COMESA region.

Similar variables have been used by other researchers including Alfaro et al. (2004), Aschauer, (1989), Balasubramanyam et al. (1996), Borensztein et al. (1998), Elboiashi (2011), Ndoricimpa (2009) and Rodrick et al. (2002), among others. The choice of the variables is also made in line with the literature and based on availability of data and concern about degrees of freedom.

The initial GDP per capita, $GDPPC_{i,0}$, is measured by the real GDP per capita lagged once. The lower the starting level of real GDP per capita the higher the predicted growth rate (Barro, 1991; Levine & Renelt, 1992). Consequently, $\gamma_0 < 0$.

The lagged GDP per capita, $GDPPC_{i,t-1}$, is expected to affect the current $GDPPC_{i,t}$ positively. Hence, $\gamma_1 > 0$. HUMCAP, is expected to promote growth and enhance the ability of the COMESA region to absorb and benefit from spillovers of aggregated or disaggregated foreign capital and financial resources. Thus, $\gamma_2 > 0$ and $\gamma_8 > 0$. Economic theory proposes that DINV has a positive
effect on the GDPPC\textsubscript{i,t} as increased rate of domestic investment promotes economic growth. It is expected that $\gamma_3 > 0$.

TOPEN is expected to have a positive impact on the GDPPC\textsubscript{i,t} and enhance the ability of the COMESA region to absorb and benefit from the spillovers of aggregated and disaggregated foreign capital and financial resources. Trade openness is expected to enlarge markets and expand domestic investment to meet increased demand for goods and services (Feder, 1982). Similarly, KAOPEN is expected to have a positive impact on domestic economic growth (Ito, 2005; Klein, 2003; Quinn & Toyoda, 2008). It is also expected to enhance the ability of the COMESA region to absorb and benefit from the spillovers of aggregated and disaggregated foreign capital and financial resources. Hence, it is expected that $\gamma_4 > 0$ and $\gamma_8 > 0$.

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, represent 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 percentage of the gross debt liabilities to GDP, on GDPPC\textsubscript{i,t}. Therefore, $\gamma_5 < 0$.

High, rising and unstable general levels of prices, reduces real future profits and causes uncertainties to investors (Larrain & Vergara, 1993; Servén & Solimano, 1993). The a priori expectation is that INFLA, measured by the annual percentage change in the consumer price index (CPI), has a negative impact on the GDPPC\textsubscript{i,t} of the host country. Therefore, $\gamma_6 < 0$.

FDI, LOANS and ODAAID are expected to affect current GDP growth positively as they increase resources for domestic investment, health, education and other social amenities. They are also accompanied by positive spillovers, modern technologies and management skills. Consequently, $\gamma_7 > 0$. REMIT provide foreign exchange, fund local investment and increase resources for health and education to improve human capital. However, when a big percentage of remittances is spent on consumption in place of productive activities, the link between REMIT and GDP growth can
be negative or positive. Hence, $\gamma_7 > 0$ or $\gamma_7 < 0$. The STFCF is expected to impact either positively or negatively to economic growth. This is because increased short term foreign capital flows may promote growth by providing additional foreign exchange capital to finance domestic business investment, improve human capital by increasing resources for health and education and reduce macroeconomic volatility on one hand or result into bankruptcies, output losses, currency appreciation and financial crisis. Hence, $\gamma_7 > 0$ or $\gamma_7 < 0$. The AFCFR is however expected to have positive effect on GDP growth.

The a priori expectation is that financial sector development (FSD) is expected to positively impact on the GDP growth and enhance the ability of the COMESA region to absorb and benefit from spillovers of aggregated and disaggregated foreign capital and financial resources (Durham, 2003; Shahbaz et al., 2011). Therefore, $\gamma_8 > 0$. High quality institutions of voice and accountability, political stability, effective governments, regulation, rule of law and low prevalence of corruption encourage investment, enhance protection of property and contract rights of investors and promote economic growth (Durham, 2003). VOA, POSTAB, GOVEF, REGQUA, RULAW and COC are expected to have a positive impact on the GDP growth and also enhance the ability of the COMESA region to absorb and benefit from aggregated and disaggregated foreign capital and financial resources. The three institutional quality variables are measured by the score on the aggregate world governance indicators. Thus, $\gamma_8 > 0$. A high quality of overall infrastructure minimizes the cost of doing business, improves private investment returns, attracts more foreign investment and promote productivity and economic growth (Aschauer, 1989; Barro, 1990). The a priori expectation is that INFR impacts positively on the GDP growth and enhances the ability of the COMESA region to absorb and benefit from spillovers of aggregated and disaggregated foreign capital and financial resources. Hence, $\gamma_8 > 0$.

Finally, a large technology gap between the host and home country slows down economic growth and reduces the direct impact and technological and knowledge spillovers of foreign capital (Colen et al., 2008; Elboiashi, 2011; Sjoholm, 1999). The a priori expectation is that TG impacts negatively on economic growth and a low TG enhances the ability of the COMESA region to absorb and benefit from spillovers of aggregated and disaggregated foreign capital and financial resources. Therefore, $\gamma_8 < 0$. 

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Finally, it is argued that well-developed human capital, well-developed financial sector, greater Openness of the economy, quality development infrastructure, low technology gap between host and home countries and institutional quality of voice and accountability, political stability, government effectiveness, regulations, rule of law and control of corruption have a positive effect on the growth impact of aggregated and disaggregated foreign capital and financial resources. The aggregated or disaggregated foreign capital and financial resources are thus interacted with these absorptive capacity variables.

4.3 Estimators

The single point, period-averaged, cross-country regression analysis consists of estimating equation 4.6 using OLS. Although this method has been applied in a number of empirical studies, including Asiedu (2002) and Mohey-ud-din (2007), it has a number of shortcomings. The utilization of a single-equation pooled OLS regression model has several shortcomings including generation of inconsistent and biased estimates since it may not take into consideration the endogeneity of some of the regressors. This failure to account for endogeneity of some of the explanatory variables calls for application of instrumental variables. The method fails to take into account dynamics and may lead to loss of information (Arellano & Bond, 1991). It may also suffer from omitted variable bias as well. This is because of exclusion of initial technical efficiency in growth regression equations. In practice, this is unobserved, therefore leading to the problem of an omitted variable of unobserved fixed effects—which can be best addressed via panel data regressions. Other limitations of applying a single-equation OLS cross-sectional regression model are discussed extensively by Temple (1999).

In order to address the flaws of estimating a conventional single-period-averaged cross-country regression model, use of appropriate panel data estimators is therefore suggested (Gyimah-Brempong & Traynor, 1999; Tsangarides, 2001). Amongst panel data estimators, it has been conventional in the literature to use either fixed or random effects estimators. However, these too are also subject to certain limitations. These are the potential endogeneity of the explanatory variables, as well as the loss of dynamic information (Temple, 1999; Nkurunziza & Bates, 2003). Since economic growth is per definition a dynamic process, and GDP tends to be highly persistent, this might be a serious omission.
In order to illustrate this, the model equation 4.4 which incorporates dynamics can be used after it is rewritten as an AR(1) model of the following form:

\[ Y_{g_{i,t}} = \tau + \gamma_0 Y_{g_{i,t-1}} + \ln X'_{i,t} \beta + \epsilon_t + \nu_i + \epsilon_{i,t} \] .................................................. 4.8

where \( Y_{g_{i,t}} \) is the GDP per capita growth rate in country \( i \) during period \( t \), \( Y_{i,t-1} \) is the lagged GDP per capita growth, \( \ln X_{i,t} \) is the natural logarithm of a vector of explanatory variables, \( \tau \) is period-specific intercept terms to capture productivity changes common to all countries; \( \nu_i \) and \( \epsilon_t \) are the unobserved country-specific and time invariant effects (unobserved fixed effects); and \( \epsilon_{i,t} \) is the time variant idiosyncratic error term.

Writing equation 4.8 in first-differences eliminates the time-invariant components, \( \nu_i \). This resolves the omitted variable bias problem and gives equation 4.9:

\[ \Delta Y_{g_{i,t}} = \tau + \gamma_0 \Delta Y_{g_{i,t-1}} + \Delta \ln X'_{i,t} \beta + \epsilon_t + \nu_i + \epsilon_{i,t} \] .................................................. 4.9

However, it generates endogeneity since \( Y_{g_{i,t-1}} \) is endogenous to the disturbance terms via \( \epsilon_{i,t-1} \). Consequently, it is not appropriate to estimate equation 4.9 by OLS (Nickell, 1981). To overcome this endogeneity problem, an instrumental variable is suggested to be used for \( \Delta Y_{i,t-1} \). Instrumental variable (IV) technique proposed by Anderson and Hsiao (1982) and GMM estimators suggested by Arellano and Bond’s (1991) and Blundell and Bond (1998) can be applied in this case. Anderson and Hsiao (1982) suggested utilizing \( \Delta Y_{g_{i,t-2}} \) or \( Y_{g_{i,t-2}} \) as instruments.

Assuming absence of second-order serial autocorrelation in the differenced idiosyncratic disturbance term, Arellano and Bond (1991) show that using the lagged level, \( Y_{g_{i,t-2}} \), as an instrument is superior and that in fact the list of instruments can be extended to include further \( Y_{g_{i,t-3}}, Y_{g_{i,t-4}}, \ldots, Y_{g_{i,t-k}} \). Moreover, the Anderson and Hsiao instrument variable technique is a special case of the GMM estimator proposed by Arellano and Bond (1991) to combine the list of instruments efficiently. This GMM estimator is preferred as it gains efficiency by utilizing additional moment restrictions. The IV technique leads to consistent but not necessary efficient estimates of the coefficients because it does not make use of all the available moment conditions (Baltagi, 2008).
Equation 4.6 is estimated using the Arellano and Bond (1991) GMM-estimator. More specifically, the first step GMM-estimator is utilized since it has been shown to result in more reliable inferences (Blundell & Bond, 1998).

The same equation 4.6 is also estimated using the Blundell-Bond (1998) GMM-estimator. However, the GDP per capita outcome may be highly persistent so the lagged levels might be very weak instruments for the first differenced equations. In this situation, the first-differenced GMM estimator potentially suffers from downward bias (Blundell & Bond, 1998). Thus, the additional set of first instruments and equations in levels make the system GMM estimator more efficient by overcoming the weak instrument problem inherent to the first-differenced GMM estimator. All the regressors, except for those which are clearly exogenous, are instrumented.

In order to check for robustness of the results, address the flaws of OLS and identify the differences estimators make to regression results, the Pooled OLS, fixed effects and GMM estimates are presented and discussed.

The study uses inferential statistics, especially F-statistic, to test the hypotheses. In order to generate regression results for the study, an Econometric package called Gnu Regression, Econometrics and Time-Series Library (GRETTL) is used. The results are then summarized into tables for ease of analysis and interpretation.

4.4 Descriptive Statistics and Correlations

The analysis starts by providing the summary descriptive statistics, presented in Table 2.2 in previous chapter two that describe the features of the data used in the study. The panel data set is rich, with 304 observations. Consequently, it is deemed normal and appropriate for the empirical analysis.

An explanatory variables correlation matrix is used to test the presence of multicollinearity in the dynamic panel data GDP per capita model specified in equation 4.6. This is because presence of perfect or near perfect linear relationship among some or all explanatory variables of a regression may lead to indeterminate regression coefficients and infinite standard errors. The correlation matrix gives a first basic expectation of the link between these variables.
Table 2.3 in chapter two presents the correlation matrix for all the regressors and GDP per capita as dependent variable. It shows that there is no linear relationship among all the explanatory variables, implying that the regression results obtain determinate parameters and finite standard errors. Additionally, the per capita GDP growth is positively correlated with domestic investment, human capital development, aggregated foreign capital and financial resources, short term foreign capital flows, cross-border bank lending, remittances, overseas development assistance and official aid, financial sector development, development of quality infrastructure, voice and accountability, political stability, effective government, regulatory quality, rule of law and control of corruption, as theoretically predicted. Conversely, the GDP per capita growth is negatively correlated with initial GDP per capita, public debt and inflation, as theoretically predicted. Further, FDI is negatively correlated to GDP per capita growth, contrary to economic theory.

4.5 Regression Results

In order to establish the difference estimators make to results, the pooled OLS, fixed effects, and GMM-system and GMM-difference techniques are used to generate the estimates. These methods are also applied so as to address the most important flaws of cross-country analyses based on ordinary least squares. To demonstrate the difference estimators make to results, regression results are reported Tables 4.1, 4.2, 4.3, 4.4, 4.5 and 4.6.

4.5.1 Pooled Ordinary Least Squares (POLs) Estimates

Temple (1999) discussed extensively the limitations of applying a single-equation OLS cross-sectional regression model. The main shortcomings have been identified in section 4.5. One serious limitation is that it may generate inconsistent and biased estimates since they may not account for the endogeneity of some of the explanatory variables and may suffer from omitted variable bias (Gyimah-Brempong & Traynor, 1999; Tsangarides, 2001). To overcome these shortcomings, panel data methods are suggested.

Despite all these shortcomings, POLS estimates are reported in Tables 4.1 and 4.2. The independent variables are chosen in such a way as to minimize simultaneity and interdependence (the two major sources of endogeneity) and to correct the standard errors of the OLS regression by the White procedure. This procedure adjusts for the presence of heteroskedasticity in the data.
On one hand, the pooled OLS results reported in Table 4.1 show that the constant terms are negative but statistically not significant. Absolute convergence is ruled out while conditional convergence is supported here. The variables that have statistically significant coefficients are also of the expected sign: while domestic investment, human capital development, aggregated foreign capital and financial resources, development of quality infrastructure, political stability, effectiveness of the government, regulatory quality, rule of law and control of corruption have a positive impact on GDP per capita, public debt, inflation and technology gap have a negative impact. The significant negative coefficients on public debt, inflation and technology gap implies that a big debt burden, macroeconomic instability and a wide technology gap between the host COMESA countries and the technology leader, USA, slows down economic growth.

Additionally, the interaction terms between the aggregated foreign capital and financial resources and all the absorptive capacity factors, save for trade openness and capital account liberalization, are statistically significant. This implies that improvement in absorptive capacity enhances the ability of the region to absorb and benefit from the spillovers of aggregated foreign capital and financial resources. Among the absorptive capacity factors, rule of law has the largest parameter and clearly the most important single effect on GDP per capita growth in the COMESA region.

The coefficient of public debt is the largest (0.961), emphasizing the adverse effect of public debt on growth in the COMESA region.
### Table 4.1: Pooled OLS Regression Results of the Impact of Aggregated Foreign Capital and Financial Resources on the GDP per Capita in the COMESA Region, 2000-2015

<table>
<thead>
<tr>
<th>Variable</th>
<th>Variant specifications of the GDP Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.276 (0.154)</td>
</tr>
<tr>
<td>Log Initial GDP per Capita (lnGDPPC_0)</td>
<td>-0.118 (0.630)</td>
</tr>
<tr>
<td>Human capital development (HUMCAP)</td>
<td>0.071 (0.076)*</td>
</tr>
<tr>
<td>Log domestic investment (lnDINV)</td>
<td>0.292 (0.000)**</td>
</tr>
<tr>
<td>Log public debt (lnPUBDEBT)</td>
<td>-0.109 (0.002)**</td>
</tr>
<tr>
<td>Log Trade openness (lnTOPEN)</td>
<td>0.461 (0.595)</td>
</tr>
<tr>
<td>Capital account openness (lnKAOPEN)</td>
<td>0.567 (0.018)**</td>
</tr>
<tr>
<td>Inflation (INFLA)</td>
<td>-0.074 (0.003)**</td>
</tr>
<tr>
<td>Log aggregated foreign capital and financial resources (lnAFCTR)</td>
<td>0.105 (0.185)*</td>
</tr>
<tr>
<td>Log financial sector development (lnFSD)</td>
<td>0.091 (0.080)*</td>
</tr>
<tr>
<td>Infrastructure (INFR)</td>
<td>0.157 (0.002)**</td>
</tr>
<tr>
<td>Log technology gap (lnTG)</td>
<td>-0.436 (0.005)**</td>
</tr>
<tr>
<td>Voice and accountability (VOA)</td>
<td>0.067 (0.159)</td>
</tr>
<tr>
<td>Political stability (POSTAB)</td>
<td>0.159 (0.000)**</td>
</tr>
<tr>
<td>Government effectiveness (GOVEF)</td>
<td>0.174 (0.005)**</td>
</tr>
<tr>
<td>Regulatory quality (REGQUA)</td>
<td>0.243 (0.000)**</td>
</tr>
<tr>
<td>Rule of law (RULAW)</td>
<td>0.274 (0.000)**</td>
</tr>
<tr>
<td>Control of corruption (COC)</td>
<td>0.014 (0.006)**</td>
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<tr>
<td>-----------------------------</td>
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</tr>
<tr>
<td>AFCFR*HUMCAP</td>
<td>0.003 (0.126)</td>
</tr>
<tr>
<td>AFCFR*KOPEN</td>
<td>0.012 (0.285)</td>
</tr>
<tr>
<td>AFCFR*FSD</td>
<td>0.021 (0.830)</td>
</tr>
<tr>
<td>AFCFR*INFFR</td>
<td>0.019 (0.046)**</td>
</tr>
<tr>
<td>AFCFR*TG</td>
<td>-0.123 (0.049)**</td>
</tr>
<tr>
<td>AFCFR*VOA</td>
<td>0.289 (0.068)*</td>
</tr>
<tr>
<td>AFCFR*POSTAB</td>
<td>0.291 (0.016)**</td>
</tr>
<tr>
<td>AFCFR*GOVEF</td>
<td>0.247 (0.066)*</td>
</tr>
<tr>
<td>AFCFR*REGQUA</td>
<td>0.523 (0.004)**</td>
</tr>
<tr>
<td>AFCFR*RULAW</td>
<td>0.361 (0.018)**</td>
</tr>
<tr>
<td>AFCFR*COC</td>
<td>0.275 (0.052)*</td>
</tr>
<tr>
<td>Number of observations</td>
<td>285 247 247 247 266 247 247 247 247 247 247 247</td>
</tr>
<tr>
<td>F-Statistic</td>
<td>F(1, 283): 0.232 (0.630)</td>
</tr>
<tr>
<td></td>
<td>F(7, 239): 5.736 (3.78e-06)</td>
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<tr>
<td></td>
<td>F(8, 238): 6.435 (1.42e-07)</td>
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<tr>
<td></td>
<td>F(8, 238): 6.963 (3.03e-08)</td>
</tr>
<tr>
<td></td>
<td>F(8, 238): 6.757 (4.83e-08)</td>
</tr>
<tr>
<td></td>
<td>F(9, 237): 6.732 (1.37e-08)</td>
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<tr>
<td></td>
<td>F(9, 237): 7.589 (9.06e-10)</td>
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<tr>
<td></td>
<td>F(9, 237): 7.507 (1.17e-09)</td>
</tr>
<tr>
<td></td>
<td>F(9, 237): 7.587 (5.38e-07)</td>
</tr>
<tr>
<td></td>
<td>F(9, 237): 8.045 (2.17e-10)</td>
</tr>
<tr>
<td></td>
<td>F(9, 237): 6.399 (3.97e-08)</td>
</tr>
<tr>
<td></td>
<td>F(9, 237): 11.396 (8.40e-15)</td>
</tr>
<tr>
<td></td>
<td>F(9, 237): 8.852 (1.77e-11)</td>
</tr>
<tr>
<td></td>
<td>F(9, 237): 5.770 (2.99e-07)</td>
</tr>
<tr>
<td>R-Squared</td>
<td>0.101 0.144 0.178 0.190 0.174 0.204 0.224 0.222 0.175 0.234 0.195 0.302 0.252 0.180</td>
</tr>
<tr>
<td>Adjusted R-Squared</td>
<td>0.103 0.119 0.150 0.162 0.148 0.173 0.194 0.192 0.144 0.205 0.165 0.276 0.223 0.149</td>
</tr>
<tr>
<td>Durbin-Watson</td>
<td>0.973 0.874 0.909 0.974 1.111 0.925 0.966 0.927 0.884 0.936 0.911 1.016 0.957 0.893</td>
</tr>
</tbody>
</table>

Note: *, ** and *** denote significance at 10%, 5% and 1%, respectively. Year and country dummies are not indicated.

Source: Author’s computations
On the other hand, Table 4.2 reports the estimates of the relative growth impact of disaggregated foreign capital and financial resources flowing to the COMESA region. The constant term is negative and not statistically significant. The results rule out absolute convergence but support conditional convergence.

The variables enter with the right sign. Human capital development, domestic investment, overseas development assistance and aid, remittances, infrastructure, voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption have a positive and statistically significant parameters. Short-term foreign capital flows exhibit a positive and statistically significant coefficients in six out of the twelve specifications. The significant and negative coefficients on public debt, inflation, FDI and technology gap between the host COMESA countries and USA, suggest that debt burdens, macroeconomic instability, FDI and wide technology gaps adversely affect the GDP per capita growth.

Overall, the coefficient of the technology gap, though negative, is the largest (0.875), emphasizing the importance of technology in driving growth in the COMESA region. Out of all the disaggregated foreign capital and financial resources, overseas development assistance and aid is the most important determinant of growth, as it has the largest parameter (0.854). Cross-border bank lending has no impact on growth.

Moreover, the coefficients of the interaction terms between FDI and all the twelve absorptive capacity factors; short term foreign capital and capital account openness, human capital development, financial sector development, voice and accountability, political stability and government effectiveness; overseas development assistance and aid and human capital development, trade openness, financial sector development, infrastructure, technology gap, government effectiveness, rule of law and control of corruption; remittances and infrastructure, voice and accountability and rule of law, are statistically significant.

Arellano and Bond (1991) argued that use of a single-equation pooled OLS regression model produce inconsistent and biased estimates as the method fail to account for omitted variable bias, endogeneity of explanatory variables, dynamics and may lead to loss of information. To overcome these problems, fixed and random effects panel data techniques are used to generate the estimates.
Table 4.2: Pooled OLS Regression Results of the Relative Impact of the Disaggregated Foreign Capital and Financial Resources on the GDP per Capita in the COMESA Region, 2000-2015

<table>
<thead>
<tr>
<th>Variable</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
<th>(9)</th>
<th>(10)</th>
<th>(11)</th>
<th>(12)</th>
<th>(13)</th>
<th>(14)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-0.028</td>
<td>-0.113</td>
<td>-0.092</td>
<td>-0.116</td>
<td>-0.125</td>
<td>-0.058</td>
<td>-0.075</td>
<td>0.695</td>
<td>-0.090</td>
<td>-0.104</td>
<td>-0.078</td>
<td>-0.085</td>
<td>-0.042</td>
<td>-0.097</td>
</tr>
<tr>
<td>Log Initial GDP per Capita (lnGDPPC)</td>
<td>-0.118**</td>
<td>-0.106**</td>
<td>-0.097</td>
<td>-0.163**</td>
<td>-0.154**</td>
<td>-0.081**</td>
<td>-0.050**</td>
<td>-0.507**</td>
<td>-0.144**</td>
<td>-0.204**</td>
<td>-0.160**</td>
<td>-0.183**</td>
<td>-0.174**</td>
<td>-0.166**</td>
</tr>
<tr>
<td>Human capital development (HUMCAP)</td>
<td>0.114</td>
<td>0.108</td>
<td>0.145</td>
<td>0.137</td>
<td>0.107</td>
<td>0.147</td>
<td>0.162</td>
<td>0.205</td>
<td>0.202</td>
<td>0.263</td>
<td>0.276</td>
<td>0.306</td>
<td>0.227</td>
<td>*</td>
</tr>
<tr>
<td>Log domestic investment (ndINIV)</td>
<td>0.362</td>
<td>0.350</td>
<td>0.339</td>
<td>0.293</td>
<td>0.331</td>
<td>0.319</td>
<td>0.327</td>
<td>0.264</td>
<td>0.304</td>
<td>0.233</td>
<td>0.168</td>
<td>0.235</td>
<td>0.335</td>
<td>*</td>
</tr>
<tr>
<td>Log public debt (lnPUBDEBT)</td>
<td>-0.094</td>
<td>-0.083</td>
<td>-0.096</td>
<td>0.127</td>
<td>-0.089</td>
<td>-0.102</td>
<td>-0.070</td>
<td>-0.093</td>
<td>-0.088</td>
<td>-0.058</td>
<td>-0.089</td>
<td>-0.044</td>
<td>-0.053</td>
<td>*</td>
</tr>
<tr>
<td>Log Trade openness (lnOPEN)</td>
<td>0.052</td>
<td>0.073</td>
<td>0.070</td>
<td>0.001</td>
<td>0.088</td>
<td>0.131</td>
<td>0.006</td>
<td>0.117</td>
<td>0.006</td>
<td>0.038</td>
<td>0.069</td>
<td>0.085</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Capital account openness (KAOOPEN)</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>0.297</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
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<td>*</td>
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</tr>
<tr>
<td>Inflation (INFLA)</td>
<td>-0.092</td>
<td>-0.090</td>
<td>-0.086</td>
<td>0.067</td>
<td>-0.107</td>
<td>-0.089</td>
<td>-0.112</td>
<td>-0.081</td>
<td>-0.083</td>
<td>-0.085</td>
<td>-0.098</td>
<td>-0.106</td>
<td>-0.108*</td>
<td>*</td>
</tr>
<tr>
<td>Log foreign direct investment (lnFDI)</td>
<td>-0.088</td>
<td>-0.074</td>
<td>-0.140</td>
<td>-0.137</td>
<td>-0.182</td>
<td>-0.122</td>
<td>-0.203</td>
<td>-0.130</td>
<td>-0.168</td>
<td>-0.164</td>
<td>-0.119</td>
<td>-0.187</td>
<td>-0.184*</td>
<td>*</td>
</tr>
<tr>
<td>Log short term foreign capital flows (lnSTFCF)</td>
<td>0.430</td>
<td>0.357</td>
<td>0.517</td>
<td>0.468</td>
<td>0.623</td>
<td>0.379</td>
<td>0.226</td>
<td>0.344</td>
<td>0.271</td>
<td>0.214</td>
<td>0.206</td>
<td>0.217</td>
<td>0.212</td>
<td>0.305</td>
</tr>
<tr>
<td>Log cross-border bank lending (lnLOANS)</td>
<td>0.210</td>
<td>0.150</td>
<td>0.081</td>
<td>0.580</td>
<td>0.076</td>
<td>0.062</td>
<td>0.388</td>
<td>0.135</td>
<td>0.015</td>
<td>0.193</td>
<td>0.370</td>
<td>0.389</td>
<td>0.310</td>
<td>0.346</td>
</tr>
<tr>
<td>Log development assistance and official aid (lnODA/AID)</td>
<td>0.062</td>
<td>0.078</td>
<td>0.854</td>
<td>0.638</td>
<td>0.333</td>
<td>0.122</td>
<td>0.112</td>
<td>0.144</td>
<td>0.479</td>
<td>0.145</td>
<td>0.182</td>
<td>0.149</td>
<td>0.078</td>
<td>0.071*</td>
</tr>
<tr>
<td>Log remittances received from abroad (lnREMIT)</td>
<td>0.309</td>
<td>0.483</td>
<td>0.473</td>
<td>0.116</td>
<td>0.211</td>
<td>0.409</td>
<td>0.446</td>
<td>0.610</td>
<td>0.563</td>
<td>0.487</td>
<td>0.352</td>
<td>0.622</td>
<td>0.468</td>
<td>0.013***</td>
</tr>
<tr>
<td>Log financial sector development (lnFSFD)</td>
<td>*</td>
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</tr>
<tr>
<td>Infrastructure (INFR)</td>
<td>*</td>
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<tr>
<td>Log technology gap (lnTG)</td>
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<tr>
<td>Voice and accountability (VOA)</td>
<td>0.135</td>
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</tr>
<tr>
<td>Political stability (POSTAB)</td>
<td>0.171</td>
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<tr>
<td>Variable</td>
<td>Coefficient</td>
<td>P-value</td>
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<td></td>
</tr>
<tr>
<td>Government effectiveness (GOVEF)</td>
<td>0.286</td>
<td>(0.000)***</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Regulatory quality (REGQUA)</td>
<td>0.273</td>
<td>(0.000)***</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Rule of law (RULAW)</td>
<td>0.340</td>
<td>(0.000)***</td>
<td></td>
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</tr>
<tr>
<td>Control of corruption (COC)</td>
<td>0.318</td>
<td>(0.00)***</td>
<td></td>
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</tr>
<tr>
<td>FDI*HUMCAP</td>
<td>0.028</td>
<td>(0.044)**</td>
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<tr>
<td>STFCF*HUMCAP</td>
<td>0.041</td>
<td>(0.198)</td>
<td></td>
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<tr>
<td>LOANS*HUMCAP</td>
<td>0.012</td>
<td>(0.556)</td>
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</tr>
<tr>
<td>ODAAID*HUMCAP</td>
<td>0.101</td>
<td>(0.051)*</td>
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</tr>
<tr>
<td>REMIT*HUMCAP</td>
<td>0.239</td>
<td>(0.216)</td>
<td></td>
<td></td>
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<td></td>
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<td>(0.177)</td>
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<tr>
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<td>0.135</td>
<td>(0.000)***</td>
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<tr>
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<td>(0.016)**</td>
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<td>LOANS*INFR</td>
<td>ODAAID*INFR</td>
<td>REMIT*INFR</td>
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<td>STFCF*TG</td>
<td>LOANS*TG</td>
<td>ODAAID*TG</td>
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<td>FDI*VOA</td>
<td>STFCF*VOA</td>
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<tr>
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<td>0.246</td>
<td>(0.095)*</td>
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<tr>
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<td>0.544</td>
<td>(0.086)*</td>
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<tr>
<td>ODAAID*COC</td>
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<td>REMIT*COC</td>
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<td>0.580</td>
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<td>3.19e-07</td>
<td>4.978</td>
<td>5.692</td>
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<td>4.784</td>
<td>6.005</td>
<td>5.05e-08</td>
<td>4.803</td>
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<td>R-Squared</td>
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<td>0.183</td>
<td>0.199</td>
<td>0.201</td>
<td>0.299</td>
<td>0.234</td>
<td>0.270</td>
<td>0.347</td>
<td>0.262</td>
<td>0.308</td>
<td>0.356</td>
<td>0.305</td>
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<td>Adjusted R-Squared</td>
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<td>0.145</td>
<td>0.144</td>
<td>0.145</td>
<td>0.251</td>
<td>0.178</td>
<td>0.216</td>
<td>0.243</td>
<td>0.183</td>
<td>0.208</td>
<td>0.257</td>
<td>0.308</td>
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<td>Durbin-Watson</td>
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<td>0.907</td>
<td>0.915</td>
<td>0.926</td>
<td>0.102</td>
<td>0.994</td>
<td>0.984</td>
<td>1.005</td>
<td>0.924</td>
<td>0.986</td>
<td>0.955</td>
<td>1.048</td>
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</table>

Note: *, ** and *** denote significance at 10%, 5% and 1%, respectively. Year and country dummies are not indicated.

Source: Author’s computations
4.5.2 Random-Effects (RE) and Fixed-Effects (FE) Panel Data Regression

The main interest in the cross-country growth model lies in determining how foreign capital, institutions, absorptive capacity and macroeconomic factors affect economic growth once unobserved heterogeneity has been controlled for. Utilizing panel data allows for not only investigation of dynamic relations, but also control for unobserved cross-section heterogeneity.

The random effects approach to estimating $\beta$ exploits the correlation in the composite error in static form of equation 4.8 (that is, a form that excludes the lagged dependent variable from the equation), $\pi_{i,t} = \nu_{i,t} + \varepsilon_{i,t}$. The method puts $\nu_i$ in the disturbance term assuming that $\nu_i$ is orthogonal to $X_{i,t}$ and use a Generalized Least Squares (GLS) estimator to take into account serial correlation in the composite error $\nu_{i,t}$.

There can however, be many cases where this axiom is violated. Particularly, $\nu_i$ can be highly correlated with $X_{i,t}$ in a framework of cross-country growth if the $\nu_i$ influences the variables that determine GDP per capita. In this case, the fixed-effects estimator is deemed more appropriate to apply. Wooldridge (2002) demonstrated that a fixed effect estimator is more robust than a random effects estimator. A shortcoming of the FE method is however that time-constant factors are excluded in $X_{i,t}$, otherwise there would be no way to distinguish the effects of such variables from the effects of the unobservable $\nu_i$. Additionally, while the fixed effects estimate controls for the problem of unobserved (time-invariant) heterogeneity, it also gives biased parameter estimates. This is because the dependent variable is a function of the fixed effect, implying that the error term is correlated with the lagged dependent variable (Baltagi, 2008).

The random-effects and fixed-effects methods of panel data estimation are appropriate for static panel data analysis. The random effects regression results are however not reported. This is because the panel data used in the study is not random but obtained from secondary sources for all countries in the COMESA region. The countries are therefore not randomly chosen either. Accordingly, a fixed effects estimator is used to estimate the static panel data GDP per capita growth model. The results of the fixed effects estimator are contained in the Tables 4.3 and 4.4.
### Table 4.3: Fixed Effects Regression Results of the Impact of Aggregated Foreign Capital and Financial Resources on the GDP per Capita in the COMESA Region, 2000-2015

<table>
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<tr>
<th>Variable</th>
<th>Variant specifications of the GDP per Capita Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.175 (0.605)</td>
</tr>
<tr>
<td>Log Initial GDP per Capita (lnGDPPC,\textsubscript{0})</td>
<td>-0.248 (0.380)**</td>
</tr>
<tr>
<td>Human capital development (HUMCAP)</td>
<td>0.309 (0.020)*****</td>
</tr>
<tr>
<td>Log domestic investment (lnDINV)</td>
<td>0.246 (0.003)*****</td>
</tr>
<tr>
<td>Log public debt (lnPUBDEBT)</td>
<td>-0.122 (0.064)*</td>
</tr>
<tr>
<td>Log Trade openness (lnTOPEN)</td>
<td>0.148 (0.295)</td>
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<td>Current account openness (KAOPEN)</td>
<td>0.753 (0.150)</td>
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<tr>
<td>Inflation (INFLA)</td>
<td>-0.128 (0.000)*****</td>
</tr>
<tr>
<td>Log aggregated foreign capital and financial resources (lnAFCFR)</td>
<td>0.311 (0.000)*****</td>
</tr>
<tr>
<td>Log financial sector development (lnFSD)</td>
<td>0.191 (0.022)**</td>
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<tr>
<td>Infrastructure (INFR)</td>
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<tr>
<td>Log technology gap (lnTG)</td>
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<tr>
<td>Voice and accountability (VOA)</td>
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<tr>
<td>Political stability (POSTAB)</td>
<td></td>
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<tr>
<td>Government effectiveness (GOVEF)</td>
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<tr>
<td>Variable</td>
<td>Coefficient 1</td>
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<td>--------------------------------</td>
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<tr>
<td>Regulatory quality (REGQUA)</td>
<td></td>
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<tr>
<td>Rule of law (RULAW)</td>
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<tr>
<td>Control of corruption (COC)</td>
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<tr>
<td>AFCFR*HUMCAP</td>
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<td>AFCFR*KAOOPEN</td>
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<td>AFCFR*FSD</td>
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<tr>
<td>AFCFR*INFR</td>
<td>0.001</td>
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<tr>
<td>AFCFR*TG</td>
<td>-0.004</td>
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<tr>
<td>AFCFR*VOA</td>
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<td>AFCFR*POSTAB</td>
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<td>AFCFR*GOVEF</td>
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</table>

Note: *, ** and *** denote significance at 10%, 5% and 1%, respectively. Year and country dummies are not indicated.

Source: Author’s computations
On one hand, the results presented in Table 4.3 show that the constant term is negative and not statistically significant. Further, the results support absolute and conditional convergence.

The coefficients of the human capital development, domestic investment, aggregated foreign capital and financial resources, financial sector development, infrastructure development, voice and regulations, political stability, regulatory quality and rule of law are positive and statistically significant at the usual levels of significance. However, the coefficients of public debt, inflation and technology gap are negative and statistically significant. Overall, technology gap is the most important determinant of growth, as it has the largest size of parameter (0.964).

The parameters of the interaction terms between the aggregated foreign capital and financial resources and human capital development, financial sector development, technology gap, voice and accountability, government effectiveness, regulatory quality and rule of law, show that improvement in absorptive capacity enables the COMESA region to absorb and benefit from positive spillovers of AFCFR inflows. They all enhance the effect of the impact of AFCFR on GDP per capita growth in the region. However, regulatory quality is the most important absorptive capacity factor when interacted with the aggregated foreign capital and financial resources, with a coefficient of 0.410.

Human capital development, domestic investment, inflation, aggregated foreign capital and financial resources, technology gap, political stability and regulatory quality have the smallest ρ-values and hence are the most significant determinants of GDP per capita growth in the COMESA region.

Compared to the POLS estimates presented in Table 4.1, public debt, government effectiveness, control of corruption and interaction terms between AFCFR and infrastructure development, political stability and control of corruption lose statistical significance, while voice and accountability and interaction term between AFCFR and financial sector development gain statistical significance in the case of fixed effects.

Additionally, inflation, aggregated foreign capital and financial resources, financial sector development, and interaction terms between AFCFR and voice and accountability and government effectiveness, become more significant, while infrastructure, rule of law, and interaction terms
between AFCFR and human capital development, technology gap, regulatory quality and rule of law, become less significant in the case of FE as compared to POLS estimates.

The size of the coefficients on the significant variables such as initial GDP per capita, human capital development, aggregated foreign capital and financial resources, financial sector development, infrastructure development, technology gap, political stability, regulatory quality, rule of law and interaction terms between the AFCFR and human capital development and government effectiveness in the FE estimation are larger than in the case of POLS. However, the coefficients of the interaction terms between AFCFR and technology gap and regulatory quality are smaller in the case of FE estimation as compared to the POLS estimation.

Finally, the size of the coefficients on the significant variables such as domestic investment and the interaction between AFCFR and rule of law in the FE estimation are roughly the same as in the POLS case, suggesting that these variables are fairly robust as to the estimation method.

On the other hand, the fixed effects regression results shown in Table 4.4 reveal that the constant term is not statistically significant and support absolute and conditional convergence. Overall, the interaction term between ODAAID and control of corruption is the most important determinant of growth, as it has the largest parameter (0.967), emphasizing the importance of low corruption and graft in promoting growth via interaction with ODA and aid. Out of all components of foreign capital and financial resources, remittances is the most important determinant of growth, as it has the largest parameter (0.615). However, short term foreign capital flows and cross-border bank lending have no impact on growth of GDP per capita in the COMESA region.

The significant parameters of the interaction terms between different components of disaggregated foreign capital, financial resources and absorptive capacity factors show that improvement in absorptive capacity enables the COMESA region to absorb and benefit from positive spillovers of the same. The absorptive capacity enhance the effect of the growth impact of disaggregated foreign capital and financial resources in the region. Overall, inflation, FDI, overseas development assistance and aid, political stability and interaction term between FDI and regulatory quality are the greatest determinants of GDP per capita growth in the COMESA region.
Table 4.4: Fixed Effects Regression Results of the Relative Impact of the Disaggregated Foreign Capital and Financial Resources on GDP per Capita in the COMESA Region, 2000-2015

<table>
<thead>
<tr>
<th>Variable</th>
<th>Variant specifications of the GDP per Capita Model</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>(1)</td>
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<tr>
<td>Constant</td>
<td>-0.175</td>
</tr>
<tr>
<td>Log Initial GDP per Capita</td>
<td>-0.248</td>
</tr>
<tr>
<td>Log domestic investment</td>
<td>0.236**</td>
</tr>
<tr>
<td>Log public debt</td>
<td>-0.604**</td>
</tr>
<tr>
<td>Log Trade openness</td>
<td>0.135**</td>
</tr>
<tr>
<td>Capital account openness</td>
<td>0.115**</td>
</tr>
<tr>
<td>Inflation</td>
<td>-0.142**</td>
</tr>
<tr>
<td>Log foreign direct investment</td>
<td>-0.207**</td>
</tr>
<tr>
<td>Log short term foreign capital flows</td>
<td>0.197**</td>
</tr>
<tr>
<td>Log cross-border bank lending</td>
<td>0.421**</td>
</tr>
<tr>
<td>Log overseas development</td>
<td>0.136**</td>
</tr>
<tr>
<td>Log remittances received</td>
<td>0.0258**</td>
</tr>
<tr>
<td>Log financial sector development</td>
<td>0.211**</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>0.239**</td>
</tr>
<tr>
<td>Log technology gap</td>
<td>-0.255**</td>
</tr>
<tr>
<td>Voice and accountability</td>
<td>0.347**</td>
</tr>
<tr>
<td>Political stability</td>
<td>0.244**</td>
</tr>
<tr>
<td>Variable</td>
<td>Coefficient</td>
</tr>
<tr>
<td>----------</td>
<td>-------------</td>
</tr>
<tr>
<td>Government effectiveness (GOVEF)</td>
<td>0.327</td>
</tr>
<tr>
<td>Regulatory quality (REGQUA)</td>
<td>0.233</td>
</tr>
<tr>
<td>Rule of law (RULAW)</td>
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<td>Control of corruption (COC)</td>
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<tr>
<td>FDI*HUMCAP</td>
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<tr>
<td>STFCF*HUMCAP</td>
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</tr>
<tr>
<td>LOANS*HUMCAP</td>
<td>0.032</td>
</tr>
<tr>
<td>ODAAID*HUMCAP</td>
<td>0.242</td>
</tr>
<tr>
<td>REMIT*HUMCAP</td>
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<tr>
<td>FDI*TOPEN</td>
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<tr>
<td>STFCF*TOPEN</td>
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<td>LOANS*TOPEN</td>
<td>0.593</td>
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<td>ODAAID*TOPEN</td>
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<td>LOANS*KAOPEN</td>
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<td>ODAAID*KAOPEN</td>
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<td>REMIT*KAOPEN</td>
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<td>FDI*FSD</td>
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<td>STFCF*FSD</td>
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<tr>
<td>LOANS*FSD</td>
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</tr>
<tr>
<td>ODAAID*FSD</td>
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<tr>
<td></td>
<td></td>
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<tr>
<td>------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>REMIT*FSD</td>
<td></td>
</tr>
<tr>
<td>FDI*INFR</td>
<td></td>
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<td>STFCF*INFR</td>
<td></td>
</tr>
<tr>
<td>LOANS*INFR</td>
<td></td>
</tr>
<tr>
<td>ODAID*INFR</td>
<td></td>
</tr>
<tr>
<td>REMIT*INFR</td>
<td></td>
</tr>
<tr>
<td>FDI*TG</td>
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</tr>
<tr>
<td>STFCF*TG</td>
<td></td>
</tr>
<tr>
<td>LOANS*TG</td>
<td></td>
</tr>
<tr>
<td>ODAID*TG</td>
<td></td>
</tr>
<tr>
<td>REMIT*TG</td>
<td></td>
</tr>
<tr>
<td>FDI*VOA</td>
<td></td>
</tr>
<tr>
<td>STFCF*VOA</td>
<td></td>
</tr>
<tr>
<td>LOANS*VOA</td>
<td></td>
</tr>
<tr>
<td>ODAID*VOA</td>
<td></td>
</tr>
<tr>
<td>REMIT*VOA</td>
<td></td>
</tr>
<tr>
<td>FDI*POSTAB</td>
<td></td>
</tr>
<tr>
<td>STFCF*POSTAB</td>
<td></td>
</tr>
<tr>
<td>LOANS*POSTAB</td>
<td></td>
</tr>
<tr>
<td>ODAID*POSTAB</td>
<td></td>
</tr>
<tr>
<td>REMIT*POSTAB</td>
<td></td>
</tr>
<tr>
<td>FDI*GOVEF</td>
<td></td>
</tr>
<tr>
<td>STFCF*GOVEF</td>
<td></td>
</tr>
</tbody>
</table>
| LOANS*GOVEF | 0.199  
|            | (0.049)**  
| ODAAID*GOVEF | 0.373  
|            | (0.044)**  
| REMIT*GOVEF | 0.077  
|            | (0.272)  
| FDI*REGQUA | 0.378  
|            | (0.004)**  
| STFCF*REGQUA | 0.145  
|            | (0.067)*  
| LOANS*REGQUA | 0.792  
|            | (0.010)**  
| ODAAID*REGQUA | 0.750  
|            | (0.037)**  
| REMIT*REGQUA | 0.709  
|            | (0.062)*  
| FDI*RULAW | 0.284  
|            | (0.037)**  
| STFCF*RULAW | 0.173  
|            | (0.078)*  
| LOANS*RULAW | 0.108  
|            | (0.182)  
| ODAAID*RULAW | 0.458  
|            | (0.306)  
| REMIT*RULAW | 0.709  
|            | (0.062)*  
| FDI*COC | 0.257  
|            | (0.053)*  
| STFCF*COC | 0.163  
|            | (0.089)*  
| LOANS*COC | 0.104  
|            | (0.169)  
| ODAAID*COC | 0.967  
|            | (0.072)*  
| REMIT*COC | 0.629  
|            | (0.055)*  

| Number of observations | 285  
|                        | 247  
|                        | 247  
|                        | 247  
|                        | 247  
|                        | 247  
|                        | 247  
|                        | 247  
|                        | 247  
|                        | 247  
|                        | 247  
| F-Statistic | F(19,265): 4.353  
|             | (1.80e-08)  
|             | F(29,217): 6.134  
|             | (4.73e-16)  
|             | F(34,212): 5.478  
|             | (2.44e-15)  
|             | F(34,212): 5.481  
|             | (2.38e-15)  
|             | F(34,212): 6.350  
|             | (3.96e-18)  
|             | F(35,211): 5.414  
|             | (2.36e-15)  
|             | F(35,211): 5.904  
|             | (5.81e-17)  
|             | F(35,211): 6.287  
|             | (3.44e-18)  
|             | F(17,211): 5.643  
|             | (4.13e-16)  
|             | F(35,211): 6.674  
|             | (2.09e-19)  
|             | F(35,211): 5.758  
|             | (1.74e-16)  
|             | F(35,211): 5.758  
|             | (1.48e-17)  
|             | F(35,211): 6.088  
|             | (5.55e-16)  
|             | F(35,211): 5.653  
|             | (3.82e-16)  
| R-Squared | 0.238  
| Adjusted R-Squared | 0.183  
| Durbin-Watson | 1.271  
| Number of observations | 285  
|                        | 247  
|                        | 247  
|                        | 247  
|                        | 247  
|                        | 247  
|                        | 247  
|                        | 247  
|                        | 247  
|                        | 247  
| F-Statistic | F(19,265): 4.353  
|             | (1.80e-08)  
|             | F(29,217): 6.134  
|             | (4.73e-16)  
|             | F(34,212): 5.478  
|             | (2.44e-15)  
|             | F(34,212): 5.481  
|             | (2.38e-15)  
|             | F(34,212): 6.350  
|             | (3.96e-18)  
|             | F(35,211): 5.414  
|             | (2.36e-15)  
|             | F(35,211): 5.904  
|             | (5.81e-17)  
|             | F(35,211): 6.287  
|             | (3.44e-18)  
|             | F(17,211): 5.643  
|             | (4.13e-16)  
|             | F(35,211): 6.674  
|             | (2.09e-19)  
|             | F(35,211): 5.758  
|             | (1.74e-16)  
|             | F(35,211): 5.758  
|             | (1.48e-17)  
|             | F(35,211): 6.088  
|             | (5.55e-16)  
|             | F(35,211): 5.653  
|             | (3.82e-16)  
| R-Squared | 0.238  
| Adjusted R-Squared | 0.183  
| Durbin-Watson | 1.271  

Note: *, ** and *** denote significance at 10%, 5% and 1%, respectively. Year and country dummies are not indicated.

Source: Author’s computations
Compared to the POLS estimates presented in Table 4.2, public debt, short term foreign capital flows, remittances, technology gap, regulatory quality and rule of law lose statistical significance in the case of fixed effects. Additionally, interaction terms between financial sector development and FDI, short term foreign capital flows, overseas development assistance and aid; voice and accountability and remittances; political stability and short term foreign capital flows; also lose statistical significance under FE.

However, the overseas development assistance and aid; financial sector development; interaction terms between human capital development and ODA and aid, financial sector development and remittances, technology gap and short term foreign capital flows, political stability and ODA, aid and remittances, government effectiveness and cross-border bank lending, regulatory quality and both cross-border bank lending and remittances, rule of law and short term foreign capital flows, and control of corruption and short term foreign capital flows, ODA and aid, gain statistical significance in the case of fixed effects.

The size of the coefficients on the significant variables such as initial GDP per capita, human capital development, inflation, FDI, infrastructure, voice and accountability, political stability, government effectiveness, interaction term between FDI and human capital development, interaction terms between infrastructure and FDI and REMIT, interaction term between voice and accountability and ODA/AID, interaction term between FDI and political stability, interaction terms between government effectiveness and FDI, STFCF and ODA/AID, interaction terms between regulatory quality and FDI and ODA/AID, interaction term between FDI and rule of law, and interaction terms between control of corruption and FDI and remittances, reported in the case of the FE estimation are larger than in the case of POLS. However, the coefficients of the domestic investment, control of corruption and the interaction term between trade openness and ODA/AID are smaller in the case of FE estimation as compared to the POLS estimation.

Lastly, the size of the coefficients on the significant variables such as the interaction terms between infrastructure and ODA/AID; technology gap and FDI and REMIT; voice and accountability and FDI; reported in the FE estimation are roughly the same as those reported in the POLS case, suggesting that these variables are fairly robust as to the estimation method.
4.5.3 GMM Estimates

The pooled OLS, random and fixed effects are not appropriate to estimate dynamic panel data models. In the case of ordinary least squares, Nerlove (1967), Nickell (1981) and Baltagi (2008) found that OLS estimates of the coefficient of the lagged dependent variable in a dynamic panel model are biased and inconsistent due to the correlation between the lagged dependent variable and the fixed effects. Baltagi (2008) also concluded that the error term is correlated with a lagged dependent variable in the case of fixed effects estimation. In order to overcome these endogeneity problems, the autoregressive dynamic GDP per capita growth panel model is estimated using the GMM-system and -difference estimators.

GMM-system estimates are presented in Table 4.5. The results support absolute and conditional convergence. The Sargan over-identifying tests rule out validity of instruments. However, the results show that all the variables enter with the right sign. The lagged GDP per capita, technology gap, government effectiveness, regulatory quality, rule of law and the interaction term between aggregated foreign capital and financial resources and technology gap are the most statistically significant variables.

Other statistically significant variables include human capital development, domestic investment, public debt, inflation, aggregated foreign capital and financial resources, financial sector development, infrastructure development, technology gap, political stability, government effectiveness, regulatory quality, rule of law, and interaction terms between aggregated foreign capital and financial resources and trade openness, technology gap, voice and accountability, regulatory quality and rule of law.

Overall, human capital development variable has the largest coefficient (0.755), emphasizing the importance of well-developed labour force in promoting growth of GDP per capita in the region.

The GMM-difference estimates presented in Table 2.4 in chapter two show that all the variables, are of the expected sign. The lagged GDP per capita and political stability are the most statistically significant determinants of GDP per capita. All other variables, except, trade openness, financial sector development, government effectiveness and interaction terms between AFCFR and trade openness, financial sector development, and voice and accountability, are statistically significant.
### Table 4.5: GMM-System Estimates of the Impact of Aggregated Foreign Capital and Financial Resources on the GDP per Capita in the COMESA Region, 2000-2015

<table>
<thead>
<tr>
<th>Variable</th>
<th>Variant specifications of the GDP per Capita Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.025</td>
</tr>
<tr>
<td></td>
<td>(0.260)</td>
</tr>
<tr>
<td>Log Initial GDP per Capita (lnGDPPC&lt;sub&gt;(i0)&lt;/sub&gt;)</td>
<td>-0.165</td>
</tr>
<tr>
<td></td>
<td>(0.057)*</td>
</tr>
<tr>
<td>GDP per Capita (lnGDPPC&lt;sub&gt;-1&lt;/sub&gt;)</td>
<td>0.356</td>
</tr>
<tr>
<td></td>
<td>(0.000)**</td>
</tr>
<tr>
<td>Human capital development (HUMCAP)</td>
<td>0.752</td>
</tr>
<tr>
<td></td>
<td>(0.010)**</td>
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<tr>
<td>Log domestic investment (lnDJINV)</td>
<td>0.149</td>
</tr>
<tr>
<td></td>
<td>(0.038)**</td>
</tr>
<tr>
<td>Log public debt (lnPUBDEBT)</td>
<td>-0.106</td>
</tr>
<tr>
<td></td>
<td>(0.074)*</td>
</tr>
<tr>
<td>Log Trade openness (lnTOPEN)</td>
<td>0.104</td>
</tr>
<tr>
<td></td>
<td>(0.327)</td>
</tr>
<tr>
<td>Capital account openness (KAOPEN)</td>
<td>0.616</td>
</tr>
<tr>
<td>Inflation (INFLA)</td>
<td>-0.067</td>
</tr>
<tr>
<td></td>
<td>(0.120)</td>
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<tr>
<td>Log aggregated foreign capital and financial resources (lnAFCFR)</td>
<td>0.168</td>
</tr>
<tr>
<td></td>
<td>(0.086)*</td>
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<tr>
<td>Log financial sector development (lnFSD)</td>
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<tr>
<td>Infrastructural development (INFR)</td>
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<td>Log technology gap (lnTG)</td>
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<td>Voice and accountability (VOA)</td>
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</tr>
<tr>
<td>Political stability (POSTAB)</td>
<td></td>
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<tr>
<td>Government effectiveness (GOVEF)</td>
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<tr>
<td>Regulatory quality (REGQUA)</td>
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</tr>
<tr>
<td>Rule of law (RULAW)</td>
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Note: * p < 0.1, ** p < 0.05, *** p < 0.01.
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<tr>
<th>Control of corruption (COC)</th>
<th>AFCFR*HUMCAP</th>
<th>AFCFR*TOPEN</th>
<th>AFCFR*KAOOPEN</th>
<th>AFCFR*FSD</th>
<th>AFCFR*INFR</th>
<th>AFCFR*TG</th>
<th>AFCFR*VOA</th>
<th>AFCFR*POSTAB</th>
<th>AFCFR*GOVEF</th>
<th>AFCFR*REGQUA</th>
<th>AFCFR*RULAW</th>
<th>AFCFR*COC</th>
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<tbody>
<tr>
<td></td>
<td>0.047</td>
<td>0.003**</td>
<td>0.045</td>
<td>0.012</td>
<td>0.012</td>
<td>-0.003</td>
<td>0.257</td>
<td>0.090</td>
<td>0.015</td>
<td>0.126</td>
<td>0.125</td>
<td>0.003</td>
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<tr>
<td></td>
<td>(0.526)</td>
<td>(0.020)**</td>
<td>(0.798)</td>
<td>(0.326)</td>
<td>(0.200)</td>
<td></td>
<td>(0.095)*</td>
<td>(0.522)</td>
<td>(0.249)</td>
<td>(0.099)*</td>
<td>(0.070)*</td>
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<td>209</td>
<td>247</td>
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<td>247</td>
<td>247</td>
<td>247</td>
<td>247</td>
<td>209</td>
</tr>
<tr>
<td>Number of instruments</td>
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<td>123</td>
<td>115</td>
<td>124</td>
<td>124</td>
<td>125</td>
<td>125</td>
<td>125</td>
<td>125</td>
<td>125</td>
<td>125</td>
<td>116</td>
</tr>
<tr>
<td>first-order</td>
<td>(0.033)**</td>
<td>(0.049)</td>
<td>(0.026)**</td>
<td>(0.036)**</td>
<td>(0.040)**</td>
<td>(0.031)**</td>
<td>(0.022)**</td>
<td>(0.012)**</td>
<td>(0.038)**</td>
<td>(0.037)</td>
<td>(0.048)</td>
<td></td>
</tr>
<tr>
<td>AB Z-Statistic test</td>
<td>1.13</td>
<td>1.194</td>
<td>1.611</td>
<td>1.516</td>
<td>1.564</td>
<td>1.524</td>
<td>1.186</td>
<td>0.542</td>
<td>1.023</td>
<td>0.663</td>
<td>0.949</td>
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<tr>
<td>second-order</td>
<td>(0.259)</td>
<td>(0.233)</td>
<td>(0.107)</td>
<td>(0.130)</td>
<td>(0.133)</td>
<td>(0.128)</td>
<td>(0.236)</td>
<td>(0.588)</td>
<td>(0.306)</td>
<td>(0.507)</td>
<td>(0.343)</td>
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<tr>
<td>Sargan over-identification</td>
<td>364.89</td>
<td>334.49</td>
<td>343.53</td>
<td>350.58</td>
<td>341.84</td>
<td>335.01</td>
<td>360.62</td>
<td>314.60</td>
<td>337.72</td>
<td>296.95</td>
<td>348.86</td>
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<td>test</td>
<td>(0.000)***</td>
<td>(0.000)***</td>
<td>(0.000)***</td>
<td>(0.000)***</td>
<td>(0.000)***</td>
<td>(0.000)***</td>
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<td>(0.000)***</td>
<td>(0.000)***</td>
<td>(0.000)***</td>
<td>(0.000)***</td>
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<tr>
<td>Wald (joint test)</td>
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<td>46.71</td>
<td>179.52</td>
<td>67.36</td>
<td>41.512</td>
<td>63.99</td>
<td>555.62</td>
<td>147.14</td>
<td>71.64</td>
<td>58.01</td>
<td>309.53</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.000)***</td>
<td>(0.000)***</td>
<td>(0.000)***</td>
<td>(0.000)***</td>
<td>(0.000)***</td>
<td>(0.000)***</td>
<td>(0.000)***</td>
<td>(0.000)***</td>
<td>(0.000)***</td>
<td>(0.000)***</td>
<td>(0.000)***</td>
<td></td>
</tr>
<tr>
<td>Adjustment Speed, (\lambda = 1 - \gamma)</td>
<td>0.644</td>
<td>0.687</td>
<td>0.616</td>
<td>0.667</td>
<td>0.693</td>
<td>0.677</td>
<td>0.668</td>
<td>0.721</td>
<td>0.682</td>
<td>0.766</td>
<td>0.700</td>
<td>0.748</td>
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<td></td>
<td>0.667</td>
<td>0.718</td>
<td>0.676</td>
<td>0.700</td>
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</tbody>
</table>

Note: \(\rho\)-values are indicated in parentheses with *, **, *** denoting levels of significance at 10%, 5% and 1%, respectively. The Arellano and Bond (AB) Z-statistic tests the null hypothesis that the residuals are first-order serial correlated (AB Z-Statistic test first-order) and the residuals are not second-order serial correlated (AB Z-Statistic test second-order). The Wald test, a joint significance test, tests the null hypothesis that the parameters of time dummies are equal to zero.

**Source:** Author’s computations
Unlike in the case of POLS, fixed-effects and GMM-system estimates presented in Tables 4.1, 4.3 and 4.5, where public debt, technology gap and human capital development variables had the largest coefficients given by -0.961, -0.964 and 0.752, respectively, the human capital development variable has the largest coefficient (0.755) in the case of GMM-difference estimator (see Table 2.4), and consequently has the most important single effect on GDP per capita growth in the region.

Some variables have become statistically significant when estimated using GMM-difference estimator as opposed to either POLS, fixed-effects or GMM-system estimators. For instance, while POLS estimates show that voice and accountability is statistically significant, it is not in the case of GMM-difference estimator. Similarly, control of corruption and interaction terms between the aggregated foreign capital and financial resources and infrastructure, political stability and control of corruption, are not statistically significant in fixed-effects estimates but are in the GMM-difference estimates. Finally, voice and accountability and interaction terms between the aggregated foreign capital and financial resources and human capital development, infrastructure, political stability, government effectiveness and control of corruption, are statistically significant in the case of GMM-difference as compared to GMM-system estimates.

The GMM-system estimates presented in Table 4.6 support both absolute and conditional convergence. The results also show that although the Sargan test rules out the validity of the instruments, all the variables enter with the correct sign. The lagged GDP per capita growth rate, human capital development, domestic investment, infrastructure, government effectiveness, regulatory quality, control of corruption and the interaction terms between FDI and political stability, voice and accountability, interaction terms between regulatory quality and cross-border bank lending, remittances, overseas development assistance and aid, are the most statistically significant variables.

Overall, the coefficient of the public debt is the largest (-0.938), emphasizing the adverse effect of domestic debt on economic growth in the COMESA countries. But compared to the rest of the disaggregated foreign capital and financial resources, ODA and aid has the largest single impact on growth of GDP per capita in the region: has a coefficient of 0.916.
<table>
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<th>Variable</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
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<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
<th>(9)</th>
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<th>(12)</th>
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<th>(14)</th>
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<td>Log Initial GDP per Capita (lnGDPPC$_{it}$)</td>
<td>-0.165</td>
<td>-0.081</td>
<td>-0.133</td>
<td>0.212</td>
<td>-0.071</td>
<td>-0.285</td>
<td>-0.190</td>
<td>-0.148</td>
<td>-0.186</td>
<td>-0.149</td>
<td>-0.151</td>
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<tr>
<td>GDP per Capita (lnGDPPC$_{it}$)</td>
<td>0.356*</td>
<td>0.284***</td>
<td>0.271***</td>
<td>0.275***</td>
<td>0.255***</td>
<td>0.248***</td>
<td>0.265***</td>
<td>0.184***</td>
<td>0.235***</td>
<td>0.203***</td>
<td>0.231***</td>
<td>0.247***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human capital development (HUMCAP)</td>
<td>0.141**</td>
<td>0.140**</td>
<td>0.168***</td>
<td>0.803***</td>
<td>0.100***</td>
<td>0.178***</td>
<td>0.219***</td>
<td>0.235***</td>
<td>0.273***</td>
<td>0.272***</td>
<td>0.308***</td>
<td>0.260**</td>
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<tr>
<td>Log domestic investment (lnDINV)</td>
<td>0.225***</td>
<td>0.222***</td>
<td>0.227***</td>
<td>0.186***</td>
<td>0.210***</td>
<td>0.239***</td>
<td>0.182***</td>
<td>0.210***</td>
<td>0.145***</td>
<td>0.129***</td>
<td>0.154***</td>
<td>0.208***</td>
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<tr>
<td>Log public debt (lnPUBDEBT)</td>
<td>-0.891**</td>
<td>-0.775**</td>
<td>-0.898**</td>
<td>-0.115**</td>
<td>-0.166***</td>
<td>-0.938**</td>
<td>-0.739**</td>
<td>-0.558**</td>
<td>-0.938**</td>
<td>-0.374**</td>
<td>-0.430**</td>
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<td>Log Trade openness (lnOPEN)</td>
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<td>0.381</td>
<td>0.638</td>
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<td>0.119</td>
<td>0.006</td>
<td>0.148</td>
<td>0.632</td>
<td>0.798</td>
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<td>Capital account openness (KAOPEN)</td>
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<tr>
<td>Inflation (INFLA)</td>
<td>-0.085**</td>
<td>-0.089**</td>
<td>-0.087**</td>
<td>-0.072**</td>
<td>-0.098**</td>
<td>-0.089**</td>
<td>-0.094**</td>
<td>-0.087**</td>
<td>-0.099**</td>
<td>-0.105**</td>
<td>-0.105**</td>
<td>-0.105**</td>
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<tr>
<td>Log foreign direct investment (lnFDI)</td>
<td>-0.100**</td>
<td>-0.086**</td>
<td>-0.141**</td>
<td>-0.131**</td>
<td>-0.134**</td>
<td>-0.164**</td>
<td>-0.130**</td>
<td>-0.178**</td>
<td>-0.164**</td>
<td>-0.173**</td>
<td>-0.173**</td>
<td>-0.173**</td>
<td>-0.173**</td>
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<tr>
<td>Log short term foreign capital flows (lnSTFCF)</td>
<td>0.206***</td>
<td>0.206***</td>
<td>0.239***</td>
<td>0.094***</td>
<td>0.262***</td>
<td>0.180***</td>
<td>0.124***</td>
<td>0.057***</td>
<td>0.079***</td>
<td>0.138***</td>
<td>0.073***</td>
<td>0.013***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log cross-border bank lending (lnLOANS)</td>
<td>0.511***</td>
<td>0.506**</td>
<td>0.462**</td>
<td>0.184***</td>
<td>0.543***</td>
<td>0.512**</td>
<td>0.240***</td>
<td>0.310***</td>
<td>0.578***</td>
<td>0.190***</td>
<td>0.682***</td>
<td>0.709***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log overseas development assistance and official aid (lnODAID)</td>
<td>0.104***</td>
<td>0.125***</td>
<td>0.128***</td>
<td>0.481***</td>
<td>0.714***</td>
<td>0.155***</td>
<td>0.633***</td>
<td>0.165***</td>
<td>0.916***</td>
<td>0.178***</td>
<td>0.180***</td>
<td>0.135***</td>
<td></td>
<td></td>
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<tr>
<td>Log remittances received from abroad (lnREMIT)</td>
<td>0.281**</td>
<td>0.044*</td>
<td>0.385***</td>
<td>0.104***</td>
<td>0.249***</td>
<td>0.394***</td>
<td>0.441***</td>
<td>0.475***</td>
<td>0.587***</td>
<td>0.487***</td>
<td>0.488***</td>
<td>0.569***</td>
<td>0.451***</td>
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<tr>
<td>Log financial sector development (lnFSD)</td>
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</table>

**Note:** The table presents GMM-system estimates of the relative impact of the disaggregated foreign capital and financial resources on GDP per capita in the COMESA Region, 2000-2015. The table includes 15 variables with their respective coefficients and standard errors.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>Significance</th>
</tr>
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<tbody>
<tr>
<td>Infrastructure (INFR)</td>
<td>0.164</td>
<td>0.006</td>
<td>***</td>
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<tr>
<td>Log technology gap (lnTG)</td>
<td>-0.247</td>
<td>0.050</td>
<td>*</td>
</tr>
<tr>
<td>Voice and accountability (VOA)</td>
<td>0.122</td>
<td>0.074</td>
<td>*</td>
</tr>
<tr>
<td>Political stability (POSTAB)</td>
<td>0.181</td>
<td>0.011</td>
<td>**</td>
</tr>
<tr>
<td>Government effectiveness (GOVEF)</td>
<td>0.260</td>
<td>0.005</td>
<td>**</td>
</tr>
<tr>
<td>Regulatory quality (REGQUA)</td>
<td>0.199</td>
<td>0.005</td>
<td>*</td>
</tr>
<tr>
<td>Rule of law (RULAW)</td>
<td>0.313</td>
<td>0.002</td>
<td>*</td>
</tr>
<tr>
<td>Control of corruption (COC)</td>
<td>0.340</td>
<td>0.005</td>
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</tr>
<tr>
<td>FDI*HUMCAP</td>
<td>0.020</td>
<td>0.060</td>
<td>*</td>
</tr>
<tr>
<td>STFCF*HUMCAP</td>
<td>0.043</td>
<td>0.050</td>
<td>*</td>
</tr>
<tr>
<td>LOANS*HUMCAP</td>
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<td>ODAAID*HUMCAP</td>
<td>0.166</td>
<td>0.037</td>
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<td>REMIT*HUMCAP</td>
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<td>0.243</td>
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<td>FDI*TOPEN</td>
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<tr>
<td>ODAAID*TOPEN</td>
<td>0.006</td>
<td>0.032</td>
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</tr>
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<td>FDI*KAOPEN</td>
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<td>STFCF*KAOPEN</td>
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</tr>
<tr>
<td>------------------------</td>
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<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>ODAAID*KAOPEN</td>
<td>0.055</td>
<td>(0.006)**</td>
<td></td>
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<tr>
<td>REMIT*KAOPEN</td>
<td>0.032</td>
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<tr>
<td>FDI*FSD</td>
<td>0.008</td>
<td>(0.060)*</td>
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<td>ODAAID*FSD</td>
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<td>ODAAID*INFR</td>
<td>0.024</td>
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<td>0.169</td>
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<td>0.198</td>
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<td>P-value</td>
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<td>0.168</td>
<td>(0.012)**</td>
</tr>
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<td>-2.127 (0.033)**</td>
<td>-2.186 (0.029)**</td>
<td>-2.231 (0.026)**</td>
</tr>
<tr>
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<td>-2.199 (0.028)**</td>
<td>-2.085 (0.037)**</td>
<td>-2.208 (0.027)**</td>
</tr>
<tr>
<td></td>
<td>-2.239 (0.015)**</td>
<td>-2.462 (0.014)**</td>
<td>-2.69 (0.023)**</td>
</tr>
<tr>
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<td>-2.313 (0.021)**</td>
<td>-2.288 (0.022)</td>
<td>-2.406 (0.016)**</td>
</tr>
<tr>
<td></td>
<td>-2.348 (0.019)*</td>
<td>-2.369 (0.018)*</td>
<td></td>
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<tr>
<td>AB Z-Statistic test second-order</td>
<td>1.130 (0.259)</td>
<td>0.399 (0.690)</td>
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</tr>
<tr>
<td></td>
<td>0.187 (0.852)</td>
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<td>0.119 (0.714)</td>
</tr>
<tr>
<td></td>
<td>0.392 (0.695)</td>
<td>0.367 (0.994)</td>
<td>0.753 (0.686)</td>
</tr>
<tr>
<td></td>
<td>0.404 (0.655)</td>
<td>0.447 (0.625)</td>
<td>0.489 (0.574)</td>
</tr>
<tr>
<td></td>
<td>0.563 (0.898)</td>
<td>0.128 (0.898)</td>
<td>0.128 (0.898)</td>
</tr>
<tr>
<td>Sargan over-identification test</td>
<td>364.89 (0.310)**</td>
<td>315.18 (0.000)**</td>
<td>315.24 (0.000)**</td>
</tr>
<tr>
<td></td>
<td>307.66 (0.000)**</td>
<td>315.29 (0.000)**</td>
<td>315.87 (0.000)**</td>
</tr>
<tr>
<td></td>
<td>293.77 (0.000)**</td>
<td>299.49 (0.000)**</td>
<td>305.31 (0.000)**</td>
</tr>
<tr>
<td></td>
<td>263.09 (0.000)**</td>
<td>289.83 (0.000)**</td>
<td>308.80 (0.000)**</td>
</tr>
<tr>
<td></td>
<td>298.56 (0.000)**</td>
<td>298.66 (0.000)**</td>
<td>284.04 (0.000)**</td>
</tr>
<tr>
<td>Wald (joint) test</td>
<td>16.48 (0.000)**</td>
<td>216.16 (0.000)**</td>
<td>15920.3 (0.000)**</td>
</tr>
<tr>
<td></td>
<td>217.6 (0.000)**</td>
<td>9240.30 (0.000)**</td>
<td>17825.2 (0.000)**</td>
</tr>
<tr>
<td></td>
<td>13103.9 (0.000)**</td>
<td>4605.22 (0.000)**</td>
<td>2708.08 (0.000)**</td>
</tr>
<tr>
<td></td>
<td>44840.4 (0.000)**</td>
<td>5465.71 (0.000)**</td>
<td>10537.4 (0.000)**</td>
</tr>
</tbody>
</table>
|                         | 2677.33 (0.000)** | 7537.75 (0.000)** | **
| Adjustment Speed, $\lambda$ | 0.644  | 0.716     | 0.729     |
|                         | 0.725  | 0.745     | 0.743     |
|                         | 0.752  | 0.704     | 0.735     |
|                         | 0.816  | 0.765     | 0.797     |
|                         | 0.769  | 0.769     | 0.753     |

Note: p-values are indicated in parentheses with *, **, *** denoting levels of significance at 10%, 5% and 1%, respectively. The Arellano and Bond (AB) Z-statistic tests the null hypothesis that the residuals are first-order serial correlated (AB Z-Statistic test first-order) and the residuals are not second-order serial correlated (AB Z-Statistic test second-order). The Wald test, a joint significance test, tests the null hypothesis that the parameters of time dummies are equal to zero.

**Source:** Author’s computations
The results of GMM-difference estimator presented in Table 3.1 show that all the variables are of the expected sign. Additionally, lagged GDP per capita growth rate; FDI; interaction term between cross-border bank lending and financial sector development; interaction term between technology gap and short term foreign capital flows; interaction term between cross-border bank lending and financial sector development; interaction terms between technology gap and short term foreign capital flows; interaction term between cross border bank lending, political stability, voice and accountability; interaction terms between government effectiveness and FDI, short term foreign capital flows and cross-border bank lending; interaction term between regulatory quality and FDI and cross-border bank lending; interaction term between cross-border bank lending and rule of law and control of corruption; are the most statistically significant determinants of GDP per capita in the COMESA region.

While the ODA and aid and the interaction term between ODAAID and control of corruption have the largest coefficients given by 0.854 and 0.967 in the case of POLS and fixed-effects in Tables 4.2 and 4.4, respectively, both the GMM-system and GMM-difference estimates presented in Tables 4.6 and 3.1 identify the interaction term between cross-border bank lending and government effectiveness and public debt as having the largest coefficients given by 0.964 and 0.938, respectively. Table 3.1 show that, compared to FDI and the rest of foreign financial resources, cross-border bank lending has the largest single impact on growth in the region.

The results also show that dynamics are important and that one gains by using a dynamic estimator. Some variables have become statistically significant when estimated using GMM-difference estimator as opposed to either POLS, fixed-effects or GMM-system estimators. For instance, while POLS estimates report that financial sector development; interaction terms between short term foreign capital flows and technology gap, regulatory quality, rule of law and control of corruption; interaction terms between cross-border bank lending and Openness of the economy, financial sector development, infrastructure, technology gap, voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and control of corruption; interaction terms between ODA and aid and human capital development, voice and accountability, and regulatory quality; and interaction terms between remittances and human capital development and technology gap; are not statistically significant, they are significant in the case of GMM-difference.
Similarly, public debt; short term foreign capital flows; cross-border bank lending; technology gap; interaction term between FDI and financial sector development; interaction terms between short term foreign capital flows and voice and accountability, political stability and regulatory quality; interaction terms between cross-border bank lending and Openness of the economy, financial sector development, infrastructure, technology gap, voice and accountability, political stability, rule of law and control of corruption; interaction terms between ODA and aid and financial sector development and rule of law; and interaction terms between remittances and human capital development; are not significant in fixed-effects but statistically significant in the GMM-difference estimates.

Finally, short term foreign capital flows; cross-border bank lending; financial sector development; interaction terms between short term foreign capital flows and human capital development, technology gap, voice and accountability, political stability, regulatory quality, rule of law and control of corruption; interaction terms between cross-border bank lending and Openness of the economy, financial sector development, technology gap and rule of law; interaction terms between remittances and human capital development and technology gap; are statistically significant in the case of GMM-difference as compared to GMM-system estimates.

4.6 Summary, Conclusion and Policy Recommendations

The purpose of this chapter is to identify the differences estimators make to regression results, check for robustness of results and address the problems associated with cross-country regression analyses using OLS. The study contributes to the literature using recent cross-country data on macroeconomic factors, foreign capital, financial resources and absorptive capacity of nineteen COMESA countries. In order to address the likelihood that estimation problems might bias the regression results, pooled OLS, fixed-effects and GMM-system and GMM-difference techniques are applied. Also, to address model uncertainty, this study reports the results of the model specification that yields the best and most significant estimates under each of these estimation methods to check the robustness of the results. This chapter therefore provides a sensitivity analysis of the results of the study.

The results indicate that application of different estimator regressions does not fundamentally change the picture. The direction of influence of the aggregated or disaggregated foreign capital
and financial resources, absorptive capacity and other macroeconomic variables shown in the estimations are preserved. Overall, the results suggest that past values of GDP per capita, capital account liberalization, human capital development, domestic investment, absorptive capacity factors, aggregated and disaggregated foreign capital and financial resources have a positive effect on GDP per capita in the COMESA region. In contrast, GDP per capita is negatively affected by FDI, public debt, inflation and technology gap. This implies that foreign capital, absorptive capacity and macroeconomic factors are important for economic growth. Moreover, improvement in the absorptive capacity have a positive effect on the growth impact of foreign capital and financial resources in the COMESA region.

However, there are some slight differences in the regression results. For example, while the results produced by POLS and GMM-difference estimators rule out absolute convergence, the results generated by FE and GMM-system estimators support it. The size of the parameters on the significant variables reported in the GMM-difference regression results are generally larger than those reported in the GMM-system, FE and OLS estimations, suggesting that these variables are fairly robust as to the estimation method. Additionally, some factors that are not statistically significant in POLS, FE and GMM-system, are significant in the GMM-difference regressions. The results confirm that the more efficient and dynamic GMM-difference estimator is better and controlling for unobserved heterogeneity, dynamic effects and endogeneity of the regressors is important.

The regression results show that the largest size of the impact of variables on economic growth in the COMESA region varies with the type of estimator used. The public debt, technology gap, human capital development, interaction term between ODA, aid and control of corruption, and the interaction term between cross-border bank lending and government effectiveness have the largest impact on economic growth. However, while GMM-difference estimations presented in Tables 2.4 and 3.1 show that, except technology gap, the other four variables have the largest impact on economic growth, GMM-system estimations in Tables 4.5 and 4.6 show that only public debt, human capital development and interaction term between ODA, aid and control of corruption exert the largest growth impact. POLS estimations presented in Tables 4.1 and 4.2 show that only public debt and technology gap exert the greatest growth impact while FE estimations in Tables 4.3 and
4.4 show that only technology gap and the interaction term between cross-border bank lending and government effectiveness exert the largest growth impact.

The results also show that the size of the growth impact of disaggregated foreign capital and financial resources in the COMESA region varies with the estimator used. For example, the POLS and GMM-system estimations presented in Tables 4.2 and 4.6, respectively, show that ODA and aid exert the largest single impact on growth in the COMESA region, while FE and GMM-difference regression results presented in Tables 4.4 and 3.1 show that remittances and cross-border bank lending, respectively, have the largest single impact on economic growth.

Additionally, the POLS and FE regression results show that the cross-border bank lending has no impact on growth, while the variable is significant in the rest of the estimations. Similarly, the FE estimations show that short term foreign capital flows has no impact on GDP per capita growth rate, while the variable is significant in the rest of the estimations.

Overall, dynamic GMM-difference estimator emerges the best estimator: it produces efficient, reliable and most robust estimates. It also controls for short panel bias, unobserved heterogeneity, dynamic effects and endogeneity of the regressors.
CHAPTER FIVE: SUMMARY, CONCLUSIONS AND POLICY RECOMMENDATIONS

5.1 Summary

This study set out to empirically investigate the effect of foreign capital and financial resources on the GDP growth in the COMESA region using panel data over the period from 2000 to 2015. The study sought to determine the overall impact of the aggregated foreign capital and financial resources on GDP per capita growth rate and examine how this is affected by the absorptive capacity, establish the relative impact of each of the components of aggregated foreign capital and financial resources on GDP per capita growth rate and examine how this is affected by the absorptive capacity, and explore the effects of applying different estimators on the regression results.

The main argument advanced in this study is that foreign capital and financial resources are important to the economic growth process of host countries as they provide capital for investment and increase resources for education, health and social services so that human capital improves and increases the growth rate of GDP per capita. It is also argued that the size of the growth impact of foreign capital and financial resources is dependent on the absorptive capacity in the host countries.

The study utilized GDP growth empirical models developed based on the theoretical framework inspired by Cobb-Douglas production function. The estimation of cross-country growth models is known to present challenges including endogeneity, unobserved heterogeneity and short panel bias among others. In order to address these challenges and generate consistent, unbiased and robust estimates, panel data estimators are applied. The GMM-differnce estimator provided the most reliable, consistent and unbiased estimates.

Based on the analysis from the study, a number of findings are drawn.

i. The aggregated foreign capital and financial resources variable has a positive and statistically significant impact on GDP per capita growth.

ii. Increased volume of foreign direct investment has a negative impact on GDP per capita growth in the COMESA region. Third, increase in short-term foreign capital, cross-border
bank lending, ODA, aid and remittances have a positive impact on the GDP per capita growth in the region.

iii. Human capital development influences the ability of the COMESA region to absorb and benefit from spillovers of the inflow of the aggregated and disaggregated foreign capital and financial resources and consequently promote the GDP per capita growth. The empirical results show that improvement in human capital development has a positive impact on the growth of GDP per capita via interaction with the aggregated and disaggregated foreign capital and financial resources.

iv. Although trade liberalization and implementation of export-oriented strategies has no direct impact on the GDP per capita growth in the COMESA region, it enables the region to absorb and benefit from spillovers of FDI and thereby promote the GDP per capita growth. A more trade openness represents a bigger market and a source of foreign exchange. It also facilitates importation of production goods.

v. Improvement in access to credit to private sector has a positive direct impact on the GDP per capita growth in the COMESA region. Further, improved access to credit to private sector influences the ability of the COMESA to absorb and benefit from spillovers of disaggregated foreign capital and financial resources and in turn promote the GDP per capita growth.

vi. Development of high quality infrastructure exerts a significant and positive impact on the GDP per capita growth in the COMESA region. It also determines the ability of the COMESA region to absorb and benefit from spillovers of the aggregated and disaggregated foreign capital and financial resources. Quality development of overall infrastructure reduces costs of doing business, integrates national markets and connects investors to low cost international markets, accelerates entrepreneurial activities and attracts foreign investors.

vii. The technology gap (TG) variable between the COMESA host countries and the USA, world’s technology leader, has a significant negative impact on GDP per capita growth, implying that a wide technology gap between home and host country tends to slow down economic growth of the host country. Reduction in the said technology gap improves the
ability of the COMESA region to absorb and benefit from spillovers of the aggregated and disaggregated foreign capital and financial resources.

viii. Quality governance structures are important for growth in the COMESA region. Improvement in voice and accountability, political stability, regulatory quality, rule of law and control of corruption exert a significant and positive impact on the GDP per capita growth. Further, improvement in voice and accountability enhances the ability of the region to absorb and benefit from spillovers of disaggregated foreign capital and financial resources. Political stability, effectiveness of the government, regulatory quality, rule of law and prevalence of low corruption and graft boost the ability of the region to absorb and benefit from spillovers of aggregated and disaggregated foreign capital and financial resources. High quality institutions and governance structures reduce the cost of doing business, enhance security of property and contract rights of investors and create the incentives for business and financial investment and savings derived from remittances, among other benefits.

ix. The impact of the aggregated and disaggregated foreign capital and financial resources on the growth of GDP per capita is positive if certain thresholds of absorptive capacity factors is reached in the COMESA region. Thus, absorptive capacity factors play a critical role in transforming the negative impact of FDI into a positive one and for AFCFR and other disaggregated foreign capital and financial resources to continue exerting a positive impact on GDP per capita growth rate.

x. Finally, public debt adversely affects the growth of GDP per capita in the COMESA region, implying that increase in the level of debt liabilities discourages investment by reducing the funds available to invest and in turn slows down economic growth. It is also possible that public debt is used to finance development projects that are intended to yield returns in the long-term future. Inflation also has a significant adverse effect on growth, implying the importance of macroeconomic stability in economic growth.

5.2 Conclusions

The study has shown that foreign capital and financial resources are important for accelerating economic growth in the COMESA region. The study concludes that aggregated foreign capital and
financial resources drive GDP growth in the COMESA region. Equally, disaggregated foreign capital and financial resources are important for the GDP growth in the COMESA region. However, while FDI has a negative impact, the rest of the disaggregated foreign capital and financial resources exert a positive impact. This implies that the different components of aggregated foreign capital and financial resources provide capital and fund growth in the region since they reduce the cost of capital and make it available to most firms. They also provide capital for investment and increase resources for education, health and social services so that human capital improves and GDP per capita grows. The study establishes that, although public debt and inflation are key determinants of growth, they have adverse effects on the GDP growth in the COMESA region.

The study also concludes that absorptive capacity factors are important determinants of growth and influence the ability of the COMESA region to absorb and benefit from spillovers of aggregated and disaggregated foreign capital and financial resources and promote the growth of GDP per capita. Improvement in the quality of human capital development, Openness of the economy, financial sector development, development of quality infrastructure, improvement in voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and prevalence of low corruption and graft enhance the ability of the COMESA region to absorb and benefit from spillovers of aggregated and disaggregated foreign capital and financial resources. The required threshold of the absorptive capacity should be reached for the region to realize a positive growth impact from the aggregated and disaggregated foreign capital and financial resources.

5.3 Policy Recommendations

Based on the findings of the study, the following recommendations are made:

a) The regional economy of the COMESA should consider increasing the volume and quality of aggregated foreign capital and financial resources so as to grow its GDP per capita growth. This can be achieved via implementing recommendations stated in (b), (c), (d), (e) and (f).
b) The countries of the COMESA region should target to attract beneficial FDI that significantly increases employment, enhances skills and boosts the competitiveness of local enterprises and therefore promote growth. Some of the beneficial FDI include investment in the manufacturing sector which produces a broad variation of linkage intensive activities as compared to primary and services sectors (UNCTAD, 2001); scientific industries such as drugs, pharmaceuticals, chemicals and electronics which produce strong positive spillovers relative to non-scientific ones such as automobiles, non-electrical machinery and metal products (Kathuria, 2000); and investment in industries with higher skill requirements and those that are more reliant on external capital (Alfaro & Charlton, 2007). Some of the policies suggested include FDI targeting. FDI targeting policies require emphasis on promotional resources to attract some types of FDI and regulate others. Targeted approach to FDI may involve screening of investment applications and granting differential incentives to different corporations or allowing repatriation of profits only out of net foreign exchange earnings, among other mechanisms125. The governments of the states of the COMESA region should consider employing some of these policies so as to attract beneficial FDI that complements economic growth.

c) COMESA countries should encourage greater inflow of high quality short-term foreign capital flows and capital transactions. However, they should be cautious to ensure that the inflows are not disruptive as they may lead to appreciation of currency and make the economy uncompetitive or lead to increase in interest rates resulting in high costs of credit and affect investment. Thus, with the growing volume of short term foreign capital flows, focus should be on how well the said inflows can be harnessed to promote economic growth and simultaneously ensuring macroeconomic stability.

125This policy is supported by Agosin and Mayer (2000) and Mwillima (2003) who showed that screening of investment applications and granting differential incentives to different corporations made FDI to be more productive in Asia in general and China, Taiwan and South Korea in particular as compared to other regions of the developing world. Other countries such as China, for instance, apply the targeted approach by allowing repatriation of profits only out of net foreign exchange earnings (Keshava, 2008).
d) The countries of the COMESA region should encourage and promote cross-border investment activities so as to harness the cross-border bank lending to support economic growth. The focus should be reforming the financial system and banking sector to allocate these foreign financial resources in productive activities that give high returns.

e) The countries should encourage greater inflows of overseas development assistance and official aid into the COMESA region by installing initial conditions that encourage unfettered flow of aid and remove uncertainty in aid inflows so as to benefit from growth effects of aid via increased level and efficacy of local investment (Gomanee et al., 2002; Lensink & Morrissey, 2000; Morrissey, 2001). The countries should particularly implement good economic policies, including good fiscal, monetary, and trade policies, so as to reap greater benefits from foreign development assistance and aid (Burnside & Dollar, 2000; Collier & Dollar, 2002). Further, the development assistance and aid agencies should monitor the proper use of foreign assistance and aid disbursed so as to prevent the diversion of these financial resources to unproductive consumption uses and corruption in the region that might undermine their effectiveness. The agencies should also avoid using a selective measure in the disbursement of overseas development assistance and official aid as a result of poor economic performance but instead raise the quality of aid flows as these foreign financial resources still facilitate the development of some poor nations and people.

f) COMESA countries should encourage greater inflow of remittances that pass through formal channels. This is because half of the remittances are claimed to be under recorded and are transferred via informal mechanisms (World Bank, 2006). These money dealers’ informal networks usually offer faster and inexpensive means of transfer as opposed to the formal channels. The informal fund transfer systems are also associated with setbacks, including smuggling of funds, money laundering and terrorist funding and macroeconomic evils such as inappropriate foreign exchange rate movement and tax collection problems.

g) The governments of the states of the region can also consider adopting a policy to lower the costs of sending remittances and remove any barriers experienced by the official remittance mechanisms so as to raise the volumes of remittances. This is because the
transfer transaction costs of remittances are high (IMF, 2005; World Bank, 2006). The governments of the COMESA member states should consider decreasing such transaction costs by promoting competition and removing barriers to entry in the remittance market. For example, due consideration should be given to lowering the capital requirements on remittance services and widening of the formal networks of financial intermediaries via allowing local banks from origin countries to operate overseas and encouraging the participation of credit unions and microfinance institutions in according cheap and safe remittances services.

h) Another policy measure is for the governments to support the introduction of technology in payment systems. For instance, to increase the official remittances to the poor, partnerships between leading commercial banks and the network of government post offices in nations that do not have banks with extensive networks of branches in rural areas need to be put in place. COMESA countries should also allocate greater resources in technology to improve on transfer of remittances by making the money transfer to the region easier, cheaper and secure. The governments should also consider using tax or exemption schemes to redirect the uses of remittances to more productive sectors of the economy. This policy should however be implemented with care as it is not clear whether using tax or exemption schemes to divert the applications of remittances to more productive sectors is necessary (Lucas, 2005). This is because some of the countries that have attempted to refocus remittance spending by applying tax on these remittances have not succeeded. For example, in 2002, Sri Lanka announced that it would impose a 15 percent tax on the USD 1.2 billion workers’ remittances received each year. However, it had to quickly withdraw the measure when there was a mass outcry (Lucas, 2005). In 2003, Pakistan and India offered incentives for migrant workers who set up or expand businesses. Pakistan migrant workers are given preferential access to imports of raw materials and capital goods and incentives for establishing units in less developed areas and encouraging investment in export processing zones (Jongwanich, 2007). Even though both are meant to raise the rate of investment out of workers’ remittances, lowering the relative costs of capital may have biased expansion.
away from much required employment creation. Other researchers such as Puri and
Ritzema (1999) pointed out that in any case, especially in India, the available fragmentary
evidence results in not significant effects of such incentives.

i) The COMESA countries should improve human capital development so as to exploit the
positive impact of the aggregated and disaggregated foreign capital and financial resources.
The governments of the COMESA states should allocate more resources to support
initiatives that ensure people lead a long and healthy life, are knowledgeable and enjoy a
decent standard of living. For instance, more resources should be allocated to availability
of affordable and effective health care systems that improve the health and life expectancy
of the people. The governments should also increase educational resources so as to raise
the literacy and school enrolment at all levels for both males and females. High literacy
and education levels improve employment opportunities for people as well as sharpening
their skills to use new technologies in production processes. Further, more resources should
be allocated to provision of other social services that support the general wellbeing of their
citizens. Finally, they should invest in programmes aimed at improving incomes per capita
and increasing access to the resources and social services needed for a decent standard of
living and to be able to participate in the life of the community.

j) The governments of the COMESA states should reform the financial sector and develop
efficient and sophisticated financial systems and sound banking to grow their economies
and attract and benefit from increased inflow of aggregated and disaggregated foreign
capital and financial resources. They should particularly improve access to credit to private
sector in the region.

k) The COMESA countries should allocate more resources to improve on the quality of
institutions and governance structures to grow their economies and attract and benefit from
the aggregated and disaggregated foreign capital and financial resources. They should particularly improve on voice and accountability, political stability, government
effectiveness, regulatory quality, rule of law and control of corruption. This requires setting
up regulatory institutions, installing efficient regulatory frameworks and enforcing
compliance to improve the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. The security and judicial systems should be reformed to ensure that agents have confidence in and abide by the rule of law, quality of contract enforcement is enhanced, crime and violence are prevented and peace and stability prevails in the COMESA region. More resources should be allocated for anti-corruption activities and measures put in place to strengthen anti-corruption institutions to reduce prevalence of corruption.

l) The COMESA countries should allocate more resources to develop quality infrastructure, roads, railroads, ports, air transport and availability of airline seat kilometres, electricity supply, fixed telephone lines and mobile telephone subscriptions and improve the existing ones so as to grow their economies and attract and benefit from spillovers of inflow of aggregated and disaggregated foreign capital and financial resources.

m) The countries should also manage the public debt prudently. This requires monitoring and evaluating the volume, utilization and repayment of public debt so as to ascertain the benefits and burden of the debt. The volume of public debt, measured by the ratio of public debt to GDP, should be kept at sustainable levels. This means that borrowed funds should be utilized in activities or projects that support economic growth and repayments made on time or rescheduled as may be appropriate.

5.4 Limitations of the Study and Areas for Further Research

The study provided findings that were within the objectives set out. However, the findings reveal potential areas that should be considered for further research. Chapter three established that foreign direct investment exert a negative significant total impact on the GDP per capita growth in the COMESA region. Despite this important finding, it is necessary to establish how the foreign direct investment capital affects the performance of specific sectors and industries in the economy. This is because the growth effects of FDI may vary across industries and the potential advantages derived from FDI might differ markedly across the primary, manufacturing and services sectors. For instance, UNCTAD (2001) noted that in the primary sector, the scope for linkages between foreign affiliates and local suppliers is limited while the manufacturing sector has a broad
differentiation of linkage intensive activities. The author added that the scope for dividing production into discrete stages and subcontracting out large parts to independent domestic firms is also limited in the tertiary sector. Further, the services sector accounts for 71% of FDI statistics, the manufacturing sector for only 27%, and agriculture for less than 1%. FDI can also have differences among industries within a sector. Using firm level data from the U.K., Girma, Greenaway and Wakelin (2001), for example, found no evidence of intra-industry spillovers in the aggregate, but strong effects when they related the extent of spillovers to industry characteristics. The authors found spillovers to be greater in higher skill industries than in lower skill ones.

Another important area this study did not establish is the impact of FDI raised within the host countries. This is because the study adopted the FDI definition advanced by the Balance of Payments Manual (5th Edition) where FDI is seen as the investment made to acquire a lasting interest in an enterprise(s) operating outside of the economy of the investor. This definition suggests that FDI involves international transfer of money, ignoring situations where FDI capital could be raised in the host economy. Researchers on FDI-growth nexus may focus on this important aspect in the future.

The impact of the short term foreign capital flows and capital transactions on the GDP per capita growth is positive and statistically significant. However, this study did not consider the effect of volatility and reversals of short-term foreign capital flows and capital transactions on the GDP per capita growth in the region. High volatility of these foreign capital flows and transactions is likely to lead to macroeconomic instability in the form of appreciation of exchange rates. Hence, future research can be directed to this area.

The study also found that cross-border bank lending exerts a significant and positive impact on the GDP per capita growth in the COMESA region. However, the cross-border economic activities in the region were not analyzed. Increase in cross-border investor activities is important in driving economic growth. Future researchers in this area may consider analyzing the participation of investors in cross-border economic activities in the region.

Overseas development assistance and official aid has a significant and positive impact on the GDP per capita growth in the COMESA region. These foreign financial resources are utilized for
financing development projects that require huge capital outlays. Thus, it may be necessary to explore the impact of the particular projects financed through ODA and aid on the economic growth rates of the COMESA in the future.

Remittances exert a positive and significant effect on the GDP per capita in the COMESA region. However, official data on remittances are believed to be underestimated, but there is little consensus as to their magnitude. For example, El-Qorchi, Maimbo and Wilson (2003) estimated that unofficial transfers of remittances to the developing world totaled to $10 billion per annum. AITE (2005) estimated that global remittances were about 2.5 times the size of recorded remittances reported in the IMF Balance of Payments data in 2005. The two estimates differ by a factor of 25. Page and Plaza (2005) noted that undercounting of remittances arises from two sources. One, most remittance source countries do not require reporting of small transactions. Remittances through post offices, exchange bureaus and other agents of money transfer companies are often not reflected in the official statistics (World Bank, 2005). Second, official data do not capture remittance flows through informal channels. Remittances transferred through agents such as informal operators or hand carried by travelers may be nearly as large as remittances through official channels. Many household surveys (Bangladesh, Pakistan, Moldova and Uganda) show widespread use of informal channels of remittances (Page & Plaza, 2005). The World Bank (2005) argued that in several Asian countries (China, Pakistan, and India) recorded remittances quadrupled, tripled or doubled between 2001 and 2003 may in part be due to a shift in flows from informal to formal channels in response to tightened regulatory scrutiny in the USA since 2001 (World Bank, 2005). Further, Sander and Maimbo (2003) reported that unrecorded flows is high in Africa. In Sudan, for example, informal remittances are estimated to account for 85 percent of total remittance receipts (Page & Plaza, 2005). Mazzucato, van den Boom and Nsowah-Nuamah (2004) found that as much as 65 percent of total remittances to Ghana are sent informally and the Bank of Ghana estimated that informal flows are at least as high as recorded flows. In South Africa an informal money remittance system exists side-by-side with the formal system, and the bulk of remittances to neighboring countries flows through informal, rather than formal channels. In the absence of systematic studies of the magnitude of informal, unrecorded remittances it is difficult to assess their impact or the policy significance of efforts to move them into formal financial.
channels. Consequently, researchers on this area should consider estimating the actual remittances and impact on GDP per capita growth in the COMESA region.
REFERENCES


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LIST OF APPENDICES
APPENDIX A1: THE FIRST-DIFFERENCE GMM ESTIMATION TECHNIQUE

This technique of estimating dynamic panel data models was advanced by Arrelano and Bond (1991).

We first set out the first-differenced GMM approach by considering a simple AR (1) model with unobserved individual-specific effects

\[ y_{i,t} = \tau y_{i,t-1} + \nu_t + \varepsilon_i \quad |\tau| < 1 \] .................................(A:1)

for \( i = 1, ..., N \) and \( t = 2, ..., T \), where \( \nu_t + \varepsilon_i \) has the standard error components structure

\[ E(\nu_i) = 0, \quad E(\varepsilon_{it}) = 0, \quad E(\varepsilon_{it}\nu_i) = 0 \] for \( i = 1, ..., N \) and \( t = 2, ..., T \) .......................... (A:2)

We also assume that the transient errors are serially uncorrelated, that is,

\[ E(\varepsilon_{it}\varepsilon_{is}) = 0 \] for \( i = 1, ..., N \) and \( s \neq t \) .......................... (A:3)

and that the initial conditions, \( y_{i1} \) are predetermined, that is,

\[ E(y_{i1}\varepsilon_{it}) = 0 \] for \( i = 1, ..., N \) and \( t = 2, ..., T \) .......................... (A:4)

Together, these axioms imply the following \( m = 0.5(T - 1)(T - 2) \) moment restrictions

\[ E(y_{i,t-s}\Delta\varepsilon_{it}) = 0 \] for \( t = 3, ..., T \) and \( s \geq 2 \) .......................... (A:5)

which can be written more compactly as

\[ E(Z_i'\Delta\varepsilon_i) = 0 \] .......................... (A:6)

Where \( Z_i = \) is the \((T-2) \times m\) matrix given by

\[
Z_i = \begin{bmatrix}
y_{i1} & 0 & 0 & \cdots & 0 & \cdots & 0 \\
0 & y_{i1} & y_{i2} & \cdots & 0 & \cdots & 0 \\
\vdots & \vdots & \vdots & \ddots & \vdots & \ddots & \vdots \\
0 & 0 & 0 & \cdots & y_{i1} & \cdots & y_{i1,T-2}
\end{bmatrix}
\] .......................... (A:7)
and $\Delta \varepsilon_i$ is the $(T-2)$ vector $(\Delta \varepsilon_{i3}, \Delta \varepsilon_{i4}, \Delta \varepsilon_{i5}, \ldots, \Delta \varepsilon_{iT})'$. These are the moment restrictions exploited by the standard linear first-differenced GMM estimator, implying the use of lagged levels dated $t-2$ and earlier as instruments for the equations in first-differences. This result is comparable to Arellano and Bond, 1991 and gives rise to a consistent estimator of $\tau$ as $N \to \infty$ with $T$ fixed.

However, this first-differenced GMM estimator has poor finite sample properties, in terms of bias and imprecision. Blundell and Bond, (1998) argued that this occurs when the lagged levels of the series are only weakly correlated with subsequent first-differences, so that the instruments available for the first-differenced equations are weak. In the AR (1) model of equation (1:A), this occurs either as the autoregressive parameter ($\tau$) approaches unity, or as the variance of the individual effects ($u_i$) increases relative to the variance of the transient shocks ($\varepsilon_{it}$).

Blundell and Bond, (1998) reported simulation results that showed that the first-differenced GMM estimator may be subject to a large downward finite-sample bias in these cases, especially when the number of time periods available is small. This finding suggests that some caution may need to be exercised before relying on this method to estimate autoregressive models for a series like GDP per capita from samples containing five or six time periods of five-year averages (Flannery & Hankins, 2012). The authors also pointed out that, the presence of explanatory variables other than the lagged dependent variable, and more particularly the inclusion of current or lagged values of these regressors in the instrument set, improve the behaviour of the first-differenced GMM estimator in particular applications. Though important, we would however not carry any investigation of this in the context of our empirical growth model specifications.

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126Blundell and Bond (1998) has shown that the distribution of the first-differenced GMM estimator has a mean of 0.239 with a standard deviation of 0.83 where $T=4$ and $N=100$ and a true value of $\tau = 0.9$. 

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