

**THE ROLE OF FINANCIAL MARKET DEVELOPMENT IN FOREIGN
DIRECT INVESTMENT AND FOREIGN PORTFOLIO INVESTMENT IN
SELECTED AFRICAN ECONOMIES**

By

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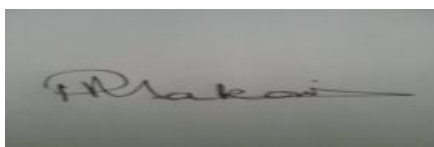
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Declaration

I, ***Patricia Lindelwa Rudo Makoni***, hereby declare that the work reported in this thesis is my own, except where otherwise indicated and acknowledged. It is submitted for the degree of Doctor of Philosophy at the University of Witwatersrand, Johannesburg. This thesis has not, in part or wholly, been submitted for a degree or examination to any other Universities.

Signature of candidate: _____

A rectangular box containing a handwritten signature in dark ink. The signature appears to be 'P. Makoni' with a stylized flourish at the end.

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Date: 29 November 2016

Dedication

This thesis is dedicated to my parents: Dr George Bryn Makoni and Mrs Cecilia Stella Makoni, who from a very young age instilled in me the importance of a solid education as an empowerment tool. Today, I can affirm that my life has been irrevocably improved through my life-long learning, and also through the hard work and perseverance of my parents who have been exemplary throughout my years of existence.

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Vekwa Mambo. Thokozani. Camagu. Ndau-we. Shewu.

Nyati imhenyu!

Abstract

The primary objective of this study was to investigate the role played by financial market development (FMD) in harnessing international capital flows of foreign direct investment (FDI) and foreign portfolio investment (FPI) in nine selected African economies, from 1980 to 2014. The study employed various econometric techniques such as the Generalised Method of Moments (GMM) for the dynamic panel data, Autoregressive Distributed Lag (ARDL) bounds testing approach to cointegration, Vector Error Correction Models (VECM) as well as Granger-causality tests. Using Principal Components Analysis (PCA), we also developed an infrastructural development index, as well as one for financial market development. The results highlighted that FDI to sampled African countries are determined by agglomeration effects, FPI, human capital development, real gross domestic product (GDP) growth, interest rates, inflation, infrastructure, trade openness, institutional quality, natural resources, and only certain individual financial market variables. FDI determinants are magnified by the application of the infrastructural and financial market development indices. FPI inflows, on the other hand, are influenced by FDI, exchange rates, stock market capitalisation, financial system liquidity, FPI agglomeration effects, capital account openness, and real GDP growth rates. The composite FMD index has a positive and highly significant effect on both FDI and FPI inflows to the selected African countries. There is reasonable evidence of bi-directional Granger causality between FDI and FPI, and FPI and overall FMD (FMD index), thus implying complementarity, as well as uni-directional Granger causality emanating from FDI to stock market capitalisation, FDI to domestic credit to the private sector by banks and also from FDI to overall financial market development in Botswana, Cote d'Ivoire, Egypt, Kenya, Mauritius, Morocco, Nigeria, South Africa, and Tunisia. In light of these findings, the policy implications are that African governments need to be conscientised on the benefits of financial market liberalisation and development. An open economy, complemented by adequate infrastructural and financial market development, plus appropriate regulation would play a significant role in attracting the type of international capital flow desired by the African host country's level of economic development, without the concern of depleting other non-renewable natural resources.

List of acronyms

ADF	Augmented Dickey-Fuller
AfDB	African Development Bank
AIC	Akaike information criteria
AltX	Alternative Exchange
ARDL	Autoregressive distributed lag
BESA	Bond Exchange of South Africa
BOP	Balance of payments
BRICS	Brazil, Russia, India, China, South Africa
BRVM	Bourse Régionale des Valeurs Mobilières
BSE	Botswana Stock Exchange
BVMT	<i>Bourse des Valeurs Mobilières de Tunis</i> (Tunis Stock Exchange)
BWA	Botswana
CCBA	Commercial bank to commercial and central bank assets
CIV	Cote d'Ivoire
CIVET	Colombia, Indonesia, Vietnam, Egypt, Turkey
CMF	Conseil du Marché Financier
CSE	Casablanca Stock Exchange
ECT	Error correction term
EGX	Egyptian Exchange
EGY	Egypt
ETFs	Electronically traded funds
EUR	Euros
FDI	Foreign direct investment
FEM	Fixed effects model
FMCG	Fast-moving consumer goods
FMD	Financial market development
FMD_INDEX	Financial market development index
FPI	Foreign portfolio investment
GBP	British Pound
GDP	Gross domestic product

GMM	Generalised Method of Moments
HUMCA	Human capital
ICAPM	International Capital Asset Pricing Model
ICRG	International Country Risk Guide
IDP	Investment Development Path
IFS	International Financial Statistics
IMF	International Monetary Fund
INFL	Inflation
INFRAS	Infrastructure
INFRAS_INDEX	Infrastructural index
INSTQ	Institutional quality
INTR	Interest rate
IPS	Im, Pesaran and Shin
JSE	Johannesburg Stock Exchange
KAOPEN	Capital openness
KEN	Kenya
LIQLI	Liquid liabilities
LLC	Levin, Lin and Chu
MAUR	Mauritius
MDP	Money demand and productivity framework
MENA	Middle East Product life cycle and Northern Africa
MNCs	Multinational corporations
MORO	Morocco
NATRES	Natural resources
NGA	Nigeria
NSE	Nairobi Stock Exchange/ Nigeria Stock Exchange
ODA	Official Development Assistance
OECD	Organisation for Economic Cooperation and Development
OLE	Ownership, location and externalisation
OLI	Ownership, location and internalisation
PAM	Portfolio allocation model
PCA	Principal components analysis

PCRED	Domestic credit to the private sector
PIIGS	Portugal, Ireland, Italy, Greece, Spain
PLC	Product life cycle
PP	Phillips-Perron
R&D	Research and development
RCM	Return and creditworthiness mode;
REM	Random effects model
REXCR	Real exchange rate
RGDPG	Real gross domestic product growth rate
RSA	South Africa
S&P	Standard and Poor
SAFEX	South African Futures Exchange
SEM	Stock Exchange of Mauritius
SMCAP	Stock market capitalisation
SMTVT	Stock market total value traded
SSA	Sub-Saharan Africa
TRDOPN	Trade openness
TUN	Tunisia
U.S	United States (of America)
UECM	Unrestricted error correction model
UK	United Kingdom
UNCTAD	United Nations Conference on Trade and Development
USD/ US\$	United States dollar
VECM	Vector error correction model
WDI	World Development Indicators
WEF	World Economic Forum
WGI	Worldwide Governance Indicators
WIQR	World Institutional Quality Rankings
WIR	World Investment Report
WTO	World Trade Organisation
ZAR	South African Rand

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Chapter One: Introduction

1.1 Background to the study

Capital flows have long attracted the interest of policy-makers, central banks, international institutions, investors and academia, mainly because the volume of flows has grown at a phenomenal rate since the beginning of the 1990s (De Santis & Ehling, 2007). This growth in capital flows has been the result of reduced controls on financial transactions, as well as improvements in the financial system and information technologies (Humanicki, Kelm & Olszewski, 2013). Reinhart and Rogoff (2012) however lamented that the increase in international capital flows, accompanied by a series of financial crises in the past three decades, has given rise to concerns about the impact of the flows in national economies. The World Trade Organisation (WTO, 1996) highlighted that despite the continued rise in FDI flows, FPI exceeded FDI in the early 1990s, and the increasing importance of FPI could result in a convergence of the two international capital flows.

According to Mercado and Park (2011) and Humanicki *et al.* (2013), international capital flows, also referred to as private capital flows, comprise of foreign direct investment (FDI), foreign portfolio investment (FPI) and other investment flows. Scholars such as Kirabaeva and Razin (2013) and Agbloyor, Abor, Adjasi and Yawson (2014), further asserted that international capital flows can be classified as either foreign direct investment (FDI), foreign portfolio investment (FPI) or foreign debt.

Foreign direct investment (FDI) is considered to be that cross-border investment undertaken by a resident in one country, with the objective of obtaining a lasting interest in, or effective (active) management control over an enterprise resident in another country (Organisation for Economic Co-operation and Development [OECD], 2008). Conceptually, for investment to qualify as FDI, emphasis is placed on the fact that the investor must meet the 10% voting share threshold. Foreign portfolio investment (FPI), on the other hand, is that investment made by a resident entity in one country in the equity and debt securities of an enterprise resident in another country, motivated by capital gains but not necessarily seeking to establish a significant interest or long term lasting relationship in the foreign enterprise

(International Monetary Fund, 1993). It comprises of investments in bonds, notes, money market instruments and financial derivatives, as well as government bonds. A further distinction is that FPI should equate to less than 10% of the voting rights of a firm, and the instruments should be tradable. Other investments refers to capital in the form of trade loans, bank loans and deposits (Humanicki *et al.*, 2013).

Given the above definitions, it is challenging to distinguish between FDI and FPI in both the theoretical and applied contexts. The distinction is demarcated by the extent of management control exerted in the foreign affiliate. In practice however, most portfolio investors are institutional investors who are not interested in the day-to-day operations of their investment portfolios (Pfeffer, 2008). Similarly, a ten percent stake in a firm is not always sufficient, in the real world, for a single FDI shareholder to have a significant influence in the running of a company. Therefore, while these definitions appear adequate and straightforward in theory, they are in fact much more complex to follow through in application, and can therefore sometimes complicate the understanding and decomposition of these international capital flows.

Until recently, FDI and FPI were considered as distinct and independent forms of international capital flows. However, in today's highly globalised world, there are several compelling reasons to treat FDI and FPI as interconnected phenomena (Humanicki *et al.*, 2013). An assertion was made by Andersen and Hainaut (1998) that Dunning's (1973) FDI motives of differential interest rates, differential rates of return and risk diversification is no longer relevant to today's firms. They further assert that the reasons firms undertake FDI is to achieve two primary goals, to enjoy cost advantages or to serve different markets.

Pfeffer (2008) interrogated the possibility of FPI when filling the risk diversification needs of investors. To achieve this, Pfeffer (2008) theoretically assessed the complementarity of FDI and FPI, by examining isolated FDI and FPI investments, and comparing them to combined portfolios of FDI and FPI. She found that the combined strategy (FDI and FPI) was preferred by firms, compared to the isolated strategies (FDI only or FPI only); a reaffirmation that the two capital flows better serve investors when used together, rather than individually. From the investor's perspective, there is a possibility that FDI and FPI complement or substitute one another.

Historically, FDI has been the preferred mode of international capital flow investment, from both the home (source) and host country perspectives. This has been the case because FDI is considered to be a safe and secure source of external financing, thereby contributing to the stabilisation of the host country's economy and financial system. However, Humanicki *et al.* (2013) point out that developing countries that were initially more open to long-term flows, have gradually become receptive to short-term flows as well, following the lifting of capital controls and further financial account liberalisation.

Humanicki *et al.* (2013) were of the view that the composition of international capital flows has given rise towards an increase in the FPI share of the total inflows, as a direct result of financial account liberalisation, as well as local financial market development in many developing countries worldwide. Furthermore, there has been growing recognition from scholars on the importance of institutional investors such as insurance companies, pension funds, private equity funds, among others. The diversification of institutional investors' portfolios has resulted in the increased volume of FPI, which in turn has provided much-needed liquidity to the global securities markets. There is no debate over why developing countries would prefer FDI over FPI, but there are equally no valid reasons why those countries cannot pursue both flows simultaneously.

Daude and Fratzscher (2008) examined the role of information frictions, institutions and financial market development on cross-border investment positions. They found that the share of inward FDI and loans is highest for countries with weak institutions and poorly developed capital markets, because investors' perceptions of such economies were that their investments would be more secure in the form of "brick and mortar" or secured loans backed by collateral as opposed to mere equity securities. In countries with poorly developed financial markets, FDI was the only avenue of investing in the economies of such countries. Their findings further highlighted the importance of strong regulatory institutions, which are a requirement to establish and bring domestic stock markets in line with international standards to be able to attract FPI inflows.

Hattari and Rajan (2008) commented that FPI is considered to be unstable “hot money”. This is because FPI is viewed as easily reversible and highly liquid. Furthermore, it is believed to create foreign exchange rate volatility which creates uncertainty thereby affecting economic growth and stability. On the other hand, Alfaro, Chanda, Kalemli-Ozcan and Sayek (2004) argued that FPI inflows into capital markets provide a large pool of funds for borrowers and this can significantly reduce the cost of capital and reach more entrepreneurs than if they operated in a small, closed market.

Sawalha, Elian and Suliman (2016) argued that FPI could contribute positively to economic growth, whether on its own or through its interaction with FDI inflows thus creating liquidity, and providing a source of low-cost capital. However, for the spillovers of FPI to be absorbed, there has to be adequately developed stock markets already in place (Sawalha *et al.*, 2016).

As such, there is a plausible cause to pursue the agenda of harnessing FPI flows because in the short run, it can provide a crucial source of temporary funding, while in the long run, it can promote further financial market development which can result in a positive impact on the economic growth of a country. Although FPI is highly sensitive and reactionary to information, liquid and easily reversible, it can also bridge the financing gap in the local economy for both domestic and international firms, hence making it a necessary evil.

1.2 International capital flows and financial market development

The term “financial market development” (FMD) has been frequently used in the literature, but to date, there is no consensus on its precise definition. Loosely applied, Soumaré and Tchana (2015) concur that FMD is simply a well-functioning financial sector or market liberalisation. Dorrucci, Meyer-Cirkel, and Santabábara (2009) provided a key empirical definition of financial market development. According to these authors, domestic financial market development is the ability of a country to allocate savings to investment projects efficiently and effectively within its borders due to (i) the quality of its institutional and regulatory framework, (ii) the size of its financial markets,

diversity of its financial instruments, as well as (iii) the performance of the financial markets in terms of efficiency and liquidity.

The effects of financial intermediation and financial markets on economic growth is magnified through capital accumulation, i.e. the rate of investment, as developed financial markets result in higher mobilisation of savings among locals. As domestic savings grow, a wider array of financial assets becomes available, leading to a deepening and broadening of the financial markets. This, coupled with sound Government policies such as those regarding foreign ownership, property rights and legal rights, leads to an attraction of foreign capital flows, whose investments can be used to increase productivity and output, resulting in increased income levels for the country (Agbloyor *et al.*, 2014).

According to Karacadag, Sundararajan and Elliot (2003), policies aimed at developing financial markets need to be carefully sequenced, taking into account the overall objectives and likely impacts of the intended action. They assert that the domestic investor base needs to be a home-grown initiative, and savings must be encouraged. The overarching strategy is to eventually have a well-functioning capital market, which will then be able to attract international investors, in the long run. As such, developing domestic financial markets is a gradual, systematic process which needs to occur concurrently with institutional reforms of good governance and risk management controls (Karacadag *et al.*, 2003).

Several empirical studies have been conducted to determine the importance of well-functioning financial markets on foreign capital inflows that stimulate economic development and economic growth. Ang (2009) investigated the role of financial market development on foreign capital inflows and economic growth in Thailand, and found that an increased level of financial development enables the Thai economy to obtain more from foreign capital inflows. Choong and Lim's (2009) study on Malaysia examined the impact of FDI and financial sector development with locational determinants, and found that the interaction between FDI and financial market development has a significant impact on the Malay economic growth. Following their assessment of Pakistan, Shahbaz and Rahman (2010) also concluded that the impact of foreign capital inflows on an economy could be improved through further financial market development.

Zakaria (2007) posits that two views exist on the inter-relationships of the three key variables under investigation in this study. According to him, FDI enhances financial market development (FMD), especially domestic stock markets, in many ways. FDI can draw international capital investors to local stock markets, in which case, the stock market acts as a conduit for foreign firms to use the equity market to raise additional capital or to dispose of their shareholdings in listed counters. In addition, domestic stock market liquidity can increase if foreign investors buy existing listed shares of other firms. In this latter case, FDI is positively correlated with stock market development, and therefore considered as a complement to stock market development (Claessens, Klingebiel and Schmukler, 2001).

On the other hand, a view exists that FDI inflows are larger in economies that are perceived as risky, institutionally weak and have under-developed financial markets. Foreign investors are forced to use the FDI route to gain a foothold in such countries in order to circumvent the challenges of investing in a country through the stock market, where there is no investor/ shareholder protection. As a result, FDI is considered to be a substitute for stock market development, and this relationship is portrayed as FDI being negatively correlated with stock market development (Zakaria, 2007). With regard to banking sector development, FDI can have a positive impact in that FDI inflows inject significant volumes of funds into the host country's banking sector. If however, foreign investors opt to rather borrow from the domestic credit market – this could potentially crowd out local firms, a situation that would not be conducive for many African economies.

A number of studies on foreign capital flows have been done, focusing mainly on FDI. There is however limited literature on FPI flows, partly due to the difficulty in distinguishing the criteria between FDI and FPI flows. Questions still arise as to what factors determine or entice international investors to prefer FDI over FPI, and further the extent to which the level of financial market development influence the inflows of FDI and FPI to developing countries in particular. It will therefore be interesting to examine the results yielded from studying selected financial markets in Africa and their role in harnessing foreign capital inflows.

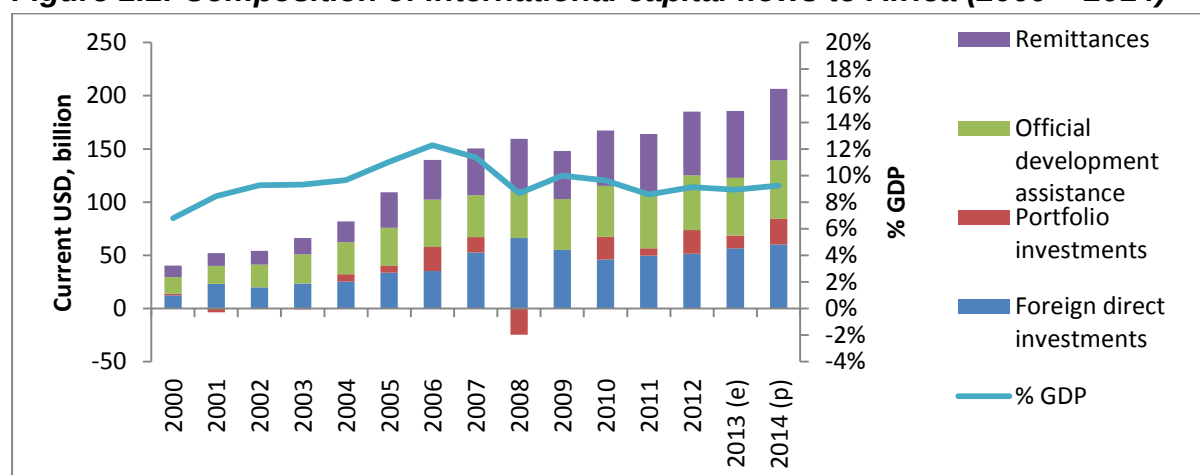
1.3 Problem statement

Africa is well-endowed with natural mineral resources and has an abundant supply of low-cost, unskilled and semi-skilled labour. In countries where there are limited deposits of natural resources, the economy is largely dependent on agriculture, manufacturing and tourism. However, despite these attractions which are the backbone of many African economies, there are limited inward flows of FDI, and even less inward flows of FPI. This can largely be attributed to the stringent policies regarding foreign ownership of companies and listed shares in some countries. For substantive inflows of FPI, investors expect financial markets to be developed enough to absorb the volumes coming into the country, and complementary policies to ensure repatriation of funds, if necessary. Investors require political stability, respect for legal and property rights, and sound corporate governance practices to ensure their investments are secure.

Asiedu (2006) acknowledged that the role of FDI as a source of capital has become increasingly important to Sub-Saharan Africa (SSA). This is because income levels and domestic savings in the region are low, a bulk of the finance will have to come from abroad, in the form of official finance such as aid from the World Bank or from private foreign investment. According to Asiedu (2006), Africa has been unable to attract significant private sector external resources, attributing to the low level of FDI inflows to Africa to excessive bureaucracy, poor governance, political instability and the reliance on basic infrastructure.

In addition, foreign portfolio investment is unavailable to most African countries, and most of the countries in region cannot raise funds from international capital markets as their own domestic financial markets are not sufficiently developed (Asiedu, 2006). The inflow of FPI would therefore avail additional financial resources for future expansion projects of both domestic and international firms, thereby reducing the dependence on bank loans.

Figure 1.1: Composition of international capital flows to Africa (2000 – 2014)



Source: African Development Bank (2015)

Figure 1.1 depicts the trend of various forms of international capital inflows to Africa. Remittances and ODA remain high, indicative of the developmental phase of most countries in Africa, coercing them to remain dependent on international funding from agencies such as the IMF and World Bank. On the other hand, remittances have proven to equally be stable and continue to provide a source of revenue for consumption, education and health expenditure by the recipients.

FDI and FPI have both shown signs of recovery since the 2008 global economic meltdown. FDI inflows to Africa rose from US\$46 billion in 2008, to US\$51.7 billion in 2012, reaching a projected US\$60.4 billion in 2014. According to the African Development Bank Economic Outlook Report (AfDB, 2015), Africa received FDI equivalent to 8.9% of its GDP. The continent still struggles to attract sufficient inward FDI, despite all the opportunities it presents to prospective international investors. These inflows of FDI have however contributed towards the productive capacities of MNCs, while also improving energy and transport infrastructure in the respective host countries (AfDB, 2015). FPI bounced back from a negative US\$24.6 billion position in 2008, to a positive US\$22 billion in 2012, and a projected US\$23.9 billion in 2014. FPI inflows in 2010 were approximately 46.7% of the FDI level, compared with a decade ago when FPI inflows were equivalent to a mere 12% of inward FDI flows. This data not only reflects the increased investor confidence, but also the integration of African financial markets with global ones in terms of security prices, and also meeting international regulatory and reporting standards (AfDB, 2015).

Of all the global markets, Africa is lagging behind in terms of financial market development. According to Anyanwu (2006), this is because African governments have stringent business, as well as financial market regulations, laws and policies that are intended to protect their citizens and domestic markets from exploitation by large foreign institutional investors, as well as limiting exposure (risk) to global financial crises. For example, some countries have restrictions on the profits that can be repatriated by international investors, making it somewhat unattractive to both FPI and FDI investors. Hence, while it is acknowledged that in order to deepen domestic financial markets, capital account liberalisation is key; African countries also believe that foreign capital complements, but does not substitute, the domestic investor base.

African economies have low financial market development thresholds, offering limited financial assets and risk diversification opportunities for international equity investors. While FPI may be shunned as it is considered temporary and short-term in nature, it can benefit African economies as they can raise additional funding from the influx of foreign investment. In order to tap into FPI flows from other countries, there must be adequately attractive financial securities in the potential host country's financial markets. These markets should offer benefits not available in the original country (to counter the "home-bias") such as higher returns with growth potential and possibly alternative avenues for diversification. However, for those securities to exchange hands, there must be developed financial markets and institutions to support the trading of the securities. International institutional investors cannot engage in offshore investments if cross-border markets are shallow, a situation which is characteristic of African countries.

If increased levels of FDI and FPI are channeled towards Africa, it could encourage the further development of local financial markets by venturing down new avenues of financial innovation. It can also be argued that an increase in the level of FDI inflows to some African countries brings in much-needed investment capital, which results in increased productivity and output. For institutions, the financial markets opening up to external investors could also see the need for sovereign states to be more transparent, have higher regard for investor rights and encourage higher levels of corporate governance. Institutional quality has the capability to improve the attractiveness of financial markets to foreign investors.

Adam and Tweneboah (2009) examined long-run relationships and found a positive impact of FDI on stock market development in Ghana from 1991 to 2006. In their exploration of the causality links between financial markets and FDI in Africa between 1990 and 2007, Agbloyor, Abor, Adjasi and Yawson (2013) found that while countries with better-developed stock markets are more likely to attract FDI inflows, FDI flows can also lead to the development of the domestic stock market. They also found that a more advanced banking system can lead to more inward FDI flows, and higher FDI flows can also lead to the development of the domestic banking system. Otchere, Soumaré and Yourougou (2015) using a panel of African countries from 1996 to 2009, also found bi-directional causality between FDI and financial market development. The results of the studies by Agbloyor *et al.* (2013) and Otchere *et al.* (2015) therefore imply significant complementarities and feedback between FDI and financial markets in Africa.

In this study, we sought to extend the above African studies by further examining the relationship between FDI and FPI, and their interaction with the domestic financial markets thereof, in an attempt to not only contribute to the body of knowledge, but also to influence policy-makers to consider the benefits of liberalising their financial markets, and other industrial sectors of the economy.

1.4 Research objectives

The broad aim of this study was to examine how, and to what extent, local financial market development (FMD) influences a country's ability to attract foreign capital (FDI and FPI) flows in selected African economies. This study intended to investigate the impact of domestic financial market development on inflows of foreign direct investment (FDI) and foreign portfolio investment (FPI), respectively, for selected African countries over the period 1980 – 2014 by examining the co-integrating and causal relationships that exist between these three key variables. The empirical findings of this study were deemed to be of importance as they would have several macro-economic policy implications for the selected African countries, and hence be used to make applied recommendations, as well as propose possible avenues for future research.

The following were the research objectives of this study:

1. Identify key determinants of FDI and FPI inflows in selected African countries.
2. Assess the long-run relationships between FDI, FPI and FMD to selected African countries.
3. Establish the direction of causality between FDI, FPI and FMD, respectively.

1.5 Research questions

The following were the research questions of this study:

1. What are the key determinants of FDI and FPI inflows in selected African countries?
2. To what extent, and in what way, are FDI and FPI inflows to selected African countries related to FMD in the long run?
3. What is the direction of causality between FDI, FPI and FMD in selected African countries, and how robust are those relationships?

1.6 Scope of the study

The core of this study was primarily the critical demarcation of international capital investment flows into foreign direct investment and foreign portfolio investment, respectively. Several definitions exist for these two types of flows, often resulting in confusion over the use of the terms, especially in practice. The working definitions of FDI, FPI and financial market development will be discussed in detail in the literature review in Chapter 2.

According to Khan and Semlali (2000), industrialised countries have enjoyed significant non-bank financial development, while developing economies have experienced rapid development within their banking sectors. They further acknowledged the growing importance of the role of capital markets in developing countries, emphasising that these cannot be ignored when examining financial market development. As such, this study incorporated variables measuring the banking sector, as well as stock markets in our selected African countries. This was necessitated by the need for a holistic overview of financial market development as

some variables accurately reflect the state of the banking sector but not the stock markets, and vice-versa, as supported by literature.

Hence, although there are 54 African countries, this study was limited to a sample drawn from the 18 active equity bourses. Due to the paucity of data on African financial markets, specifically stock markets, for the period under review from 1980 – 2014, the study focused only on Botswana, Cote d'Ivoire, Egypt, Kenya, Mauritius, Morocco, Nigeria, South Africa, and Tunisia as the sample of African countries.

1.6 Significance of the study

Despite several existing studies on the role of the domestic financial markets and their role in economic growth, a knowledge gap still exists on the relationships between FDI, FPI and financial market development, respectively, and the direction of causality thereof, specifically in the context of African countries. This is primarily due to the limited availability of empirical studies on the causal relationships between FDI and FPI, FDI and FMD and FPI and FMD. Furthermore, the interest in the role of financial market development in international economics is a contemporary phenomenon. Globally, the scholars' growing acknowledgement on the need to pay attention to financial market development has been spurred by growth economics. Thus, this has given rise to, and justification for, empirical studies, particularly on developing economies, to closely examine the impact of financial market development on countries' domestic and foreign investment policies that affect the attraction of international capital flows.

In recent years, researchers have begun to conduct studies on the relationship between financial market development and international capital flows. The majority of this research has focused more on FDI than FPI. Although Alfaro *et al.* (2004) were the pioneers of research into the role of financial market development in the context of international capital flows, several other scholars have emerged since then (see Azman-Saini, Law & Ahmad, 2010; Dutta & Roy, 2011; Choong, 2012; Agbloyor *et al.*, 2013; 2014; Otchere *et al.*, 2015; Soumaré & Tchana, 2015).

The acknowledgement by earlier researchers (Reinhart & Rogoff, 2012; Goldstein, Razin & Tong, 2008; De Santis & Ehling, 2007) that international capital flows are becoming increasingly important has created additional opportunities for future research to be conducted, studying various elements of these capital flows. The changing economic and political landscape globally, and in Africa too, has given rise to exciting challenges for investors, regulators, governments and researchers alike. As such, it was envisaged that this study would complement the existing literature on the FDI-FPI-FMD nexus, specifically in the African context.

This study aimed to identify and confirm the key determinants of FDI and FPI inflows to a selected sample of African countries. In addition, it sought to examine the extent to which different variables of financial market development accounted for (or were accounted for by) FDI and FPI inflows in those selected African economies in the long run. Lastly, in assessing the causality arising between FDI, FPI and FMD variables, the study pursued the objective of clarifying whether a trade-off or complementarity relationship exists between these FDI and FPI inflows, and whether FMD was responsible for the attraction of either of the international capital flows to Africa, and vice-versa.

Apart from the study by Agbloyor *et al.* (2014), no other study had singularly empirically examined both FDI and FPI inflows to African countries. Scholars such as Noman, Rahman and Naka (2015), and Xue-jun Kang (2006) previously conducted similar studies on the complementarity between FDI and FPI, using developed and emerging markets as points of reference. Khan and Banerji (2015) also examined the relationship between FDI and FPI in India, and found that, all things being equal, there is a long-run relationship between FDI and FPI, with FDI being the likely cause of FPI with some time lag.

Thus, we attempted to reconcile the two international capital flows. In light of the declining official development assistance and debt from international funding agencies, FDI and FPI could provide an important alternative form of funding for enhanced, sustainable economic development and economic growth in developing countries. If adequately developed local financial markets were available, FDI and FPI

could potentially be complementary or even substitutes for one another since investors have a choice of investment.

However, since this study took into account the different variables of assessing financial market development, we could only confirm this assertion after analysing the data because the assumption may not necessarily have yielded the same results for African countries due to the state of financial market development, and the accompanying regulatory and institutional environment, among other reasons. This was important because it provided a convincing argument for the case of governments to attract adequate levels of both FDI and FPI by developing their local financial markets, as well as ensuring a business environment conducive to complement other domestic policies. This study could therefore advocate for further appropriate foreign investment policies that promote economic growth to reduce unemployment and poverty, with the empirical evidence at hand.

The completion of this study therefore had the potential to make a significant contribution to the discipline of international economics by providing sufficient and convincing academic evidence on the increasing importance of FDI, complemented by FPI, and the presence of developing local financial markets as an economic necessity, particularly in the African context.

1.7 Contribution to knowledge

Various international economics, trade, law and finance phenomena have been studied. However, few studies have been undertaken to investigate the relationship between FDI and FPI, and the role played by financial market development. Also, these earlier studies focused mainly on emerging markets and developed countries, with limited emphasis given to developing countries, and Africa specifically.

There was a void in the clear understanding and demarcation of foreign direct investment and foreign portfolio investment flows, as they pertained to not only the national accounts but also in their explanatory use theory and practice. A gap was identified in the form of a need for an in-depth empirical study in the African context to identify the determinants of FDI and FPI flows, understand the relationships between

the two flows and financial market development, as well as to determine the direction of causality between FDI, FPI and financial market development in Africa.

The primary objective of this study was therefore to provide empirical evidence on the long-run relationships between FDI and FPI, and the role played by the development of the local financial markets in attracting these two forms of foreign investment, to selected developing African countries. Earlier studies by Omran and Bolbol (2003), Alfaro *et al.* (2004; 2010), Villegas-Sanchez (2009), Ang (2009) and Azman-Saini *et al.* (2010) examined the impact of financial market development on various aspects of growth and development economics. Hermes and Lensink (2003) specifically argued that the development of local financial markets might determine the extent to which foreign firms will be able to borrow in the recipient country in order to extend their innovative activities in the host country. Therefore, there was a need to conduct this research to ascertain if similar results would be yielded by examining a different set of countries whose economies and financial markets are at various economic development stages.

The main contribution of the study lay in the confirmation of the relationship between FDI and FPI inflows, as well as the investigation of the role of domestic financial market development in the attraction and retention of FDI and FPI inflows to the selected host African countries. According to Hearn, Piesse and Strange (2010), stock market development facilitates both FDI and FPI. This is achieved through the acquisition of shares in local firms, thereby supplementing low levels of domestic savings. Agbloyor, *et al.* (2013) were of the view that for African studies, it is imperative to also examine the role of credit markets. Since the banking sector in Africa is much more developed than the equity markets, a significant amount of inward foreign investment is intermediated by banks rather than the stock markets. Hence, while stock markets provide equity finance for investment, the banking sector provides debt finance mobilised at low cost, thereby implying a complementary relationship between the two (Agbloyor *et al.*, 2013).

Levine (1997) had earlier also argued that banks and capital markets are complementary to each other in terms of financial services provision to the economy, and should be examined together as far as possible. It was on this basis that this study

encompassed variables reflecting both stock market development, as well as banking sector development. Similar to Mahonye (2014), Love and Zicchino (2006) and Demirguc-Kunt and Levine (1996), we developed a composite financial market development (FMD) index comprising of five indicators of financial development using Principal Components Analysis (PCA), in order to capture the complementarity of the banking sector and stock market variables. This composite FMD index added more value to this study than the work of earlier scholars who focused only on individual measures of banking sector and/ or stock market variables.

In addition, due to the differing needs of foreign investor in terms of the quantity and quality of infrastructure available, it was necessary to create an infrastructure development index using Principal Components Analysis (PCA). Previous scholars such as Asiedu (2002; 2006) and Anyanwu (2012) have used a single proxy such as telephone lines per 1,000 people of the population to measure infrastructural development. However, this variable has become outdated and does not capture the wide array of infrastructure required for productivity across all sectors of the economy. In this study, we thus combined five different measures of transportation logistics, telecommunications and electricity in order to construct infrastructural development index for the sample of African countries.

An additional contribution to knowledge creation of this study is that we deviated from the use of the traditional KKM index of governance used to measure institutional quality in several previous economic studies. Therefore, we adopted the Kuncic (2014) database to measure the institutional quality of African economies. This database, which runs from 1990 to 2010, groups over thirty institutional indicators derived from different sources such as the Heritage Foundation, Freedom House, Fraser Institute, International Country Risk Guide (ICRG), World Bank Worldwide Governance Indicators (WGI), Polity and Transparency International into legal, political and economic institutions, with the objective of computing an index of institutional quality to capture the institutional environment (Kuncic, 2014). Therefore, applying a database which already incorporates multiple sources would be plausible and more value-adding than using an index based on a single source.

Despite the recent research conducted by Agbloyor *et al.* (2013; 2014), Otchere *et al.* (2015), and Soumaré and Tchana (2015), on the importance of financial market development in harnessing international capital inflows in Africa, there still remains a dearth in the literature, particularly where FPI inflows are concerned. This study contributes towards filling this gap in the literature by highlighting the importance of financial market development, FDI and FPI for African countries in terms of the relationships and direction of causality thereof. This was achieved by empirically testing the key drivers of FDI and FPI inflows, confirming the complementarity between the two international capital flows in the presence of financial market development, as well as identifying the direction of causality, in the selected Africa countries. The empirical results were then used to inform the government policy recommendations, as well as to propose avenues for future research.

Moreover, developed financial markets in Africa can contribute to an even more efficient allocation, of not only domestic savings but also international capital inflows, into productive sectors of the economy, thereby enhancing value-creation for foreign investors, who in turn will increase future foreign investment injections into the continent. As such, this study created new knowledge, complementary to the existing literature and empirical evidence on the FDI-FPI-FMD nexus in Africa, and this was enhanced particularly by the application of the financial market development and infrastructural development composite indices.

1.8 Conclusion

In summary, this chapter introduced the study by outlining the background to the study. The problem statement was clearly articulated. The research objectives, research questions and thesis statement were also stated. The scope of the study, its significance, motivation and contribution to knowledge were also detailed herein.

Chapter Two will present a review of the relevant literature pertaining to the key theoretical and empirical aspects of the main concepts of foreign direct investment, foreign portfolio investment and financial market development, as applied in this study. Chapter Three examines the concepts and trends of foreign direct investment, foreign

portfolio investment and financial market development, specifically in the African context. Chapter Four details the methodology applied in the study. The chapter will also state and justify the selection of variables, as well as the sample of African countries. Furthermore, Chapter Four will expose the underlying estimation techniques and clearly state and motivate the reasons for selecting each method applied. Chapter Five presents the data analysis and will discuss the main findings thereof. The study will end with Chapter Six which contains a concluding summary of the entire study, as well as possible recommendations, and implications for future studies.

Chapter Two: Literature Review

2.1 Introduction

The purpose of this chapter is to articulate the theoretical and empirical underpinnings of this study. Section 2.2 provides a general overview of international capital flows and financial market development. Sections 2.3, 2.4 and 2.5 survey the existing theoretical and empirical literature on foreign direct investments, foreign portfolio investments and financial market development, respectively. Section 2.6 summarises the aforementioned discussions.

2.2 Overview of international capital flows and financial market development

Over the past few decades, there has been an increased participation by foreigners in the domestic markets of many developing countries (Mangena & Taurigana, 2007), attributable mainly to domestic stock market liberalisation due to regulatory changes in those countries. The consensus view in the literature indicates that foreign investors play a significant role in emerging markets (Humanicki, Kelm & Olszewski, 2013). Some of the reasons put forward for encouraging foreign investment include that it promotes large volumes of capital inflows in developing economies, thereby improving liquidity and efficiency of domestic financial markets. Additionally, the opening up of the domestic markets to foreign investment increases the value of domestic firms, thereby reducing their cost of equity capital. It also improves the inflow of foreign currency available for the host nations balance of payments international transactions (Bekaert & Harvey, 2000; Jefferis, 1995).

There are various theories and empirical studies on FDI and FPI, most of which focus on the status of these two international capitals flows and their effect on economic growth. Despite globalisation, foreign direct investment (FDI) and foreign portfolio investment (FPI) have long been considered as distinct and independent forms of international capital flows (Humanicki *et al.*, 2013). However, since our interest was to establish the relationship between FDI and FPI, and the contribution made by domestic financial market development in attracting and retaining the two international capital flows, we sought to determine the inter-relationships between the three

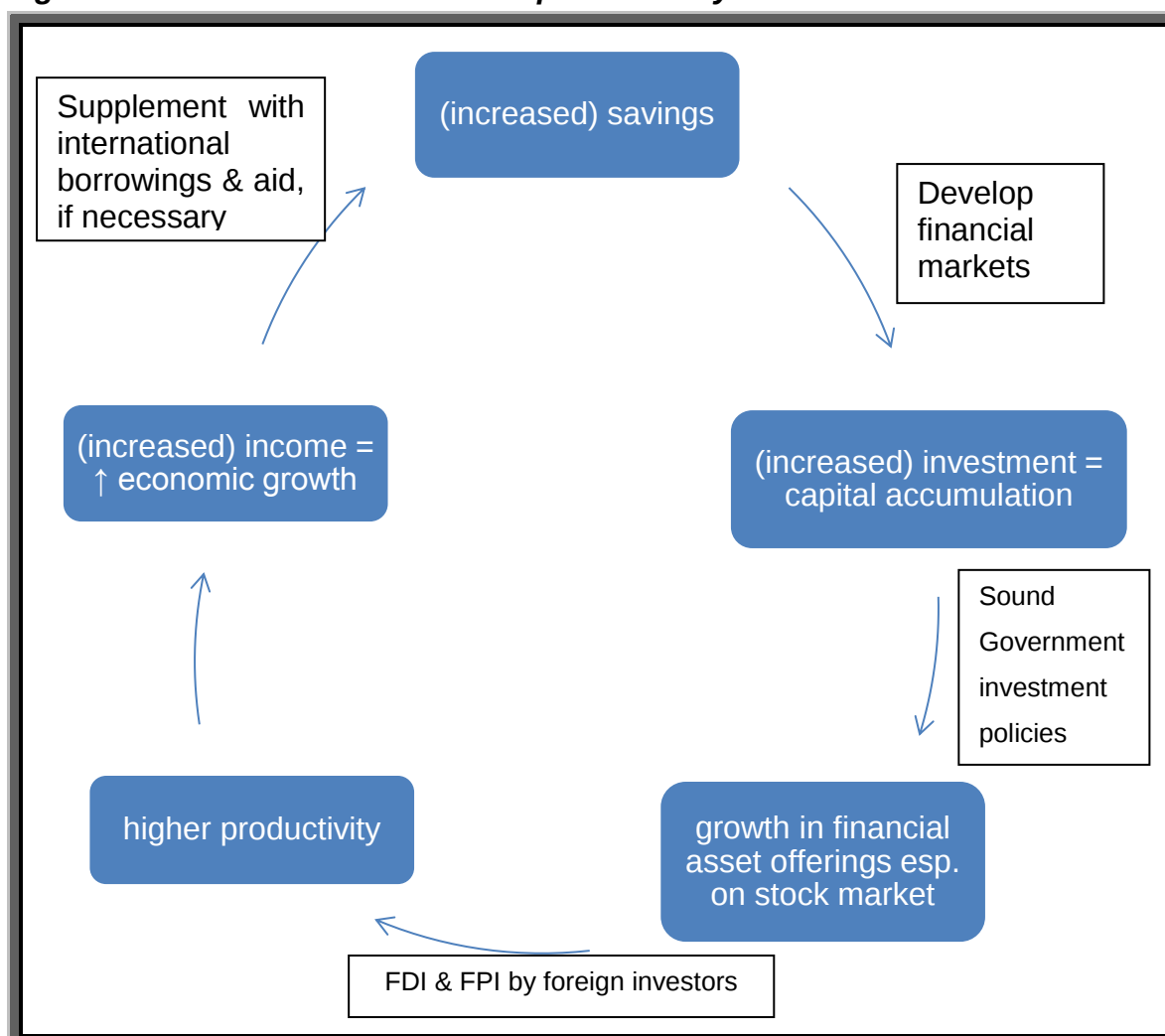
variables, as well as the direction of causality between each, by examining the relevant underlying theories.

In today's highly globalised world, there are several compelling reasons to treat FDI and FPI as interconnected phenomena (Humanicki *et al.*, 2013). Pfeffer (2008) examined the possibility of FPI flows being an alternative option for investors seeking to diversify risk, in order to fill the gap left by FDI. Pfeffer (2008) theoretically assessed the complementarity of FDI and FPI, and found that firms use FPI to adjust to short-term changes, while maintaining the status quo of FDI; hence a firm using the combined strategy (FDI and FPI) was more cost-effective and value-adding than using the isolated strategies (FDI only or FPI only).

Empirically, Xue-jun Kang (2006) also examined the relationship between inward FDI, FPI and economic growth in America using a VAR model. They found that a complementary relationship exists between FDI and FPI, noting that the influence of FPI on FDI was stronger than that of FDI on FPI. More recently, an empirical study by Noman, Rahman and Naka (2015) also confirmed the complementarity between FPI and FDI flows, when they reached two major conclusions: a positive and complementary relationship exists between FPI and FDI; and that the impact of FPI on FDI is greater than the impact of FDI on FPI at an aggregate level across national borders.

Figure 2.2 illustrates the conceptual dynamics of domestic financial markets and how they interact with inward foreign capital flows to enhance local economic growth. As domestic savings grow, a wider array of financial assets becomes available, leading to a deepening and broadening of the financial markets. This, coupled with sound government policies such as those regarding foreign ownership, property rights and legal rights, leads to an attraction of foreign capital flows, whose investments can be used to increase productivity and output, resulting in increased income levels for the country.

Figure 2.2: Financial market development life cycle



Sources: Jones (2004) Adaptation of the “Applications of the Harrod-Domar Theory” and Agbloyor, Abor, Adjasi, and Yawson (2014:141) “Model of Foreign capital flows, financial markets and economic growth”.

Figure 2.2 was also applied in the work of Agbloyor *et al.* (2014) who postulated that foreign capital flows boost domestic investment in the host country by adding to the savings. Domestic financial markets transform these accumulated savings into investment (domestic savings plus foreign capital inflows), thereby increasing human capital and innovation, which translate into increased levels of productivity. Ultimately, this stimulates economic growth and attracts further inflows of foreign capital. This is a simple conceptualisation of how foreign capital inflows interact with the domestic financial markets, and makes a positive contribution to the overall performance of the domestic economy. Ghartey (2015) further argued that although in under-developed financial markets, self-financed investments require large, real cash balances; this situation is counteracted as capital markets develop, the stock (equity) market plays

an active and significant role by harnessing surplus savings for investment and production.

There is a vast amount of international finance literature that focuses on increased financial liberalisation and financial globalisation, and the effects thereof on the home and host countries of global capital flows (see Humanicki *et al.*, 2013; Cipriani & Kaminsky, 2007; Stiglitz, 2004; Prasad, Rogoff, Wei & Kose, 2003; Singh, 1997). There are also many raging debates about the contribution made by foreign investors to developing countries, especially African economies. Previous studies have been more pro-FDI than FPI due to the permanency of FDI. According to Albuquerque (2003), FDI largely involves investment projects in brick and mortar, other capital expenditure, as well as intangible assets, which from the host country's perspective, the associated high entry and exit costs make FDI less liquid and difficult to reverse (Ahmad, Cova & Harrison, 2004).

The literature on the development of financial markets was also deemed important to this study as it facilitated a better theoretical understanding of how these financial markets influence FDI and FPI inflows, and vice-versa. As such, the theories and empirical results of FDI, FPI and financial market development will now be discussed in detail.

2.3 Foreign direct investment

2.3.1 Definitions of foreign direct investment

Foreign direct investment is defined as international investment made by one economy's resident entity, in the business operations of an entity resident in a different economy, with the intention of establishing a lasting interest (International Monetary Fund [IMF], 1993). Foreign direct investment (FDI) occurs when an investor based in one country (the home country) acquires an asset in another country (the host country) with the intent to manage that asset (World Trade Organisation, 1996). The management dimension is what distinguishes FDI from portfolio investment in foreign stocks, bonds and other financial instruments. Alternatively, FDI can be considered as the ownership of 10% or more of the ordinary shares or voting stock of an enterprise

which is usually considered to indicate 'significant influence' by an investor (IMF Statistics, 2000). However, this differs from country to country and can even be determined by their policies, some of which restrict the levels of shareholdings of foreigners in local firms.

Foreign direct investment is that foreign investment that establishes a lasting interest in or effective (active) management control over an enterprise (World Bank, 2004). In the OECD (2008) publication titled *The Benchmark Definition of FDI*, FDI is defined as the net inflows of investment undertaken to acquire a lasting management interest (10% or more of the voting stock) in a firm conducting business in any other economy but the investor's home country. For investment to qualify as FDI, emphasis is placed on the fact that the investor must meet the 10% voting share threshold. (OECD, 2008). Lipsey, Feenstra, Hahn and Hatsopoulos (1999) had earlier commented that this "lasting interest" implies the existence of a long-term relationship between the direct investor and the firm, as well as a significant degree of influence on the management of the firm.

For the purposes of this study, FDI refers to all inward foreign investment flows which are intended to be permanent, e.g. FDI in infrastructure such as building of manufacturing plants and factories, mineral extraction plants and agricultural investment. The FDI data for selected African countries was derived from the Balance of Payments figures as recorded by the World Bank.

2.3.2 Theoretical background

The history and origins of FDI theories

The origins of FDI are not yet fully understood. Although many schools of thought have been used to explain this phenomenon, there is still no consensus on any superior or general theory of foreign direct investment. FDI theory is rooted in the early work of Smith (1776) as cited in Smith (1937 and Ricardo (1817) related to international specialisation of production. This dates as far back as 1776 in Smith's theory of absolute advantage, in which he explained that trade between two nations will occur if one country is able to produce and export goods using a given amount of capital and labour, more than its closest competitor (absolute advantage). However, Smith's

theory did not explain how trade arose between countries where one country was not in the business of production.

Ricardo (1817) then explained FDI using the theory of comparative advantage. Ricardo (1817) was more interested in international factor movements as he was of the opinion that labour and capital were mobile domestically but not across borders. However, his theory was flawed because it was based on the assumptions of two countries, two products and perfect factor mobility, but still did not justify international capital movements. This was therefore in direct contrast to the notion that, in a world typified by perfect competition, FDI would not exist anyway (Kindleberger, 1969).

According to Denisia (2010), if markets were efficient, with no barriers to trade or competition, international trade would be the only mode of participation in the global markets. It was against this background that when Hymer (1976) published his 1960 thesis, he laid the foundation for other authors to come up with more plausible theories of FDI. In his arguments, Hymer (1976) found that FDI was motivated by the need to reduce or eliminate international competition among firms, as well as multi-national corporations' (MNCs) wishes to increase their returns gained from using special advantages such as access to raw material, economies of scale, access to labour, low transaction costs, intangible assets in the form of brands and patents (Makoni, 2015).

Mundell (1957) came up with a 2-sector model of international capital flows whereby capital flows were considered to be a substitute to international trade, resulting in factor price equalisation between countries. Mundell (1957) extended Ricardo's theory of comparative advantage by developing a model encompassing two countries, two products, two factors of production and two identical production functions in both countries (Denisia, 2010). However, Mundell's model considered more short term, international portfolio type of investments rather than FDI, and therefore could not explain international production through FDI. Many of the earlier theories were based mainly on the United States (U.S.) and Europe.

To remedy the shortcomings of Mundell's model, Kojima and Ozawa (1984) contextualised their model in Japan by extending the neo-classical theory of factor endowments to explain trade in intermediate products, namely technology and managerial skills (Dunning and Lundan, 2008). Kojima and Ozawa (1984) argued that

FDI occurs if a country has comparative disadvantage in producing one product, while international trade depends on comparative advantage. The underlying principle is that FDI originates in the investing country's comparatively disadvantaged industry or activity, which is potentially a comparatively advantaged industry in the host country. Under these circumstances, FDI and international trade are complementary, and result in a dynamic reorganisation with associated gains for all countries involved. FDI therefore provides MNCs with the opportunity to pursue those endowments which enable it to produce goods and provide services more efficiently and effectively at a lower cost, in the host country.

The emergence and trend of post-Second World War investments (a shift from exporting to FDI) made by US firms to Western European countries between 1950 and 1970 can be explained using Vernon's (1966) product life cycle (PLC) theory. According to his theory, firms go through four production cycles: innovation, growth, maturity and decline. The underlying principles of this theory were technological innovation and market expansion. Hence, while technology ensured the conceptualisation and development of a new product, the market size influenced the extent and type of international trade. In the initial stage, new products were invented, produced and sold in the internal markets. If the product was successful, production increased, new markets were penetrated and exports developed. This was the transition from growth to maturity. It was also during this maturity phase that competitors emerged, and the product originator then set up a production facility in the foreign market country to meet growing demand. Product standardisation occurred and incremental investment was then directed to any global site which offered the lowest input costs. After that, the product was exported back to the initial innovation country (exporter became importer as per the PLC) where it was eventually phased out, and the PLC started all over again with the innovation of yet another product, since to emerge from the decline phase, the firm had to be innovative again (Nayak & Choudhury, 2014). This was precisely what transpired when European firms began imitating the American products being exported to them; US firms had to set up production infrastructure in the local markets in order to maintain their market shares (Denisia, 2010).

Makoni (2015) notes that like other FDI theories, the PLC theory also has its limitations. As pointed out by Boddewyn (1985), the product life cycle is just a theory because it was not tested empirically. The PLC theory also does not take into account all FDI determinants, in that, for example, it only explains the location aspects of manufacturing infrastructure but not their ownership (e.g. manufacturing under licence or set up subsidiaries). The theory is a simplified decision-making process, which assumes a smooth-sailing, sequential journey with no obstacles, and is more applicable to industries that use technology for its innovation (Buckley & Casson, 1976). It was further criticised for its failure to explain why it is profitable for a firm to pursue FDI rather than maintain its exporting strategy, nor the timing of the move to invest internationally (Nayak & Choudhury, 2014).

According to Boddewyn (1983), in the early 1980s, a cohort of researchers such as Casson (1979), Calvet (1981), Grosse (1985) and Rugman (1980) put forth their own versions of FDI theories. Although some of these researchers made a concerted effort to incorporate capital, location, industrial organisation, growth of the firm, market failure, foreign exchange parity, investment portfolio and product lifecycle theories into one whole theory to attempt to explain the motives and patterns of FDI, most credit is given to Dunning's eclectic paradigm (theory) of international production (Boddewyn, 1983). The best-known theory of FDI is Dunning's 1977 Eclectic Paradigm in which he states that FDI occurs under different scenarios of ownership, locational and internalisation advantages (OLI). This theory will be discussed in detail later, as it will be compared to more recent theories of FDI. Recently, Popovici and Calin (2014) concluded that FDI theory is based on three integrative theories, the theory of international capital markets, the firm theory and the theory of international trade. As such, it further necessitates the examining of FDI theories from two economic perspectives: the macroeconomic and the microeconomic views on FDI.

Classifying FDI theories

According to Denisia (2010), the macroeconomic perspective on FDI is that FDI itself is a type of cross-border capital flow, between home and host countries, and is captured in the balance of payments statement of countries. The microeconomic perspective on the other hand relates to the motives for investments across national boundaries, as seen from the investor's point of view.

This follows on from Shin (1998) who critically reviewed existing theories of FDI and cited various scholars who classified FDI theories in a similar manner. Petrochilos (1983) classified macroeconomic FDI decisions based on variables which determine the investment decision, and mimic corporate investment behaviour, under the importance of the market size of the host country as measured by the GDP, growth of the market size, factor prices, interest rates, profitability and investor protection against tariffs and other such elements. According to Petrochilos (1983), the microeconomic determinants, drawn from the theory of industrial organisation (theory of the firm), are more concerned with firm and industry features which would give MNCs certain advantages over domestic firms. Caves (1971) gives examples of these features which include product differentiation, technology, the product life cycle and the size of the firm as measured by its sales or the value of its assets.

Gray (1981) pointed out that macroeconomic FDI theories emphasize country-specific factors, and were more aligned to trade and international economics, whereas microeconomic FDI theories are firm-specific, relate to ownership and internalisation benefits and lean towards an industrial economics, market imperfections bias.

Macroeconomic FDI theories

Lipsey (2004) described the macroeconomic view as seeing FDI as a particular form of the flow of capital across national borders, from home countries to host countries, measured in the balance-of-payments statistics. These flows give rise to a particular form of stocks of capital in host countries, namely the value of home-country investment in entities, typically corporations, controlled by a home-country owner, or in which a home-country owner holds a certain share of voting rights. Lipsey (2004) further explained that the variables of interest were the flow of financial capital, the value of the stock of capital that was accumulated by the investing firms, and the flows of income from the investments. Macro-level determinants that impact on a host country's ability to attract FDI include market size, economic growth rate, GDP, infrastructure, natural resources, institutional factors such as the political stability of the country, among others. The various theories are discussed below.

Capital market theory

This theory, also sometimes referred to as the “currency area theory”, is one of the earliest theories which explained FDI. Based on the work of Aliber (1970), it postulated that foreign investment in general arose as a result of capital market imperfections. FDI specifically was the result of differences between source and host country currencies which saw FDI flows move from strong currency countries into weak-currency countries. (Nayak & Choudhury, 2014). According to Aliber (1970), weaker currencies have a higher FDI-attraction ability and are better able to take advantage of differences in the market capitalisation rate, compared to stronger country currencies.

In as much as FDI investors are willing to pay a higher price to invest in the strong currency country as compared to a firm in a weak currency country; there exists a bias attributable to the fact that weak currencies are believed to have a greater risk and volatility than stronger currencies. This being the case, there is no incentive for investors from weak currency countries to transfer FDI into strong currency countries. However, firms from strong currency countries have an advantage over domestic firms in the weak currency country, and will hence find it profitable to pursue their FDI agenda in such economies (Moeti, 2005). Moreover, source country MNCs based in hard currency areas can borrow at a lower interest rate than host country firms because portfolio investors overlook the foreign aspect of source country MNCs. This gives source country firms the borrowing advantage because they can access cheaper sources of capital for their overseas affiliates and subsidiaries than what local firms would access the same funds for (Aliber, 1970).

While this capital market theory holds true in the case of developed countries such as the United States, United Kingdom and Canada, it was challenged by later scholars on the basis of ignoring basic currency risk management fundamentals. A major criticism of Aliber’s theory was that the theory was not applicable nor relevant in the case of less developed countries with highly imperfect or non-existent capital markets, and those with heavily regulated foreign exchange rates. Also, Nayak and Choudhury (2014) allude to the fact that Aliber’s theory does not explain investment between two developed countries with similar strength currencies, nor how developing country MNCs with weaker currencies are able to invest in developed countries with much

stronger currencies. They exemplified this using the case of Chinese firms with sizeable investments in the United States (US) and the United Kingdom (UK).

Location-based approach to FDI theories

Although FDI location is influenced by firm behaviour (a microeconomic element) insofar as the motives of its location, that is, whether it is resource-seeking, market-seeking, efficiency-seeking or strategic asset seeking; the overarching decision is in fact taken on the basis of economic geography, which is a macroeconomic decision as it takes cognisance of country-level characteristics (Popovici & Calin, 2014). According to them, the theory explained the success of FDI among countries based on the national wealth of a country, such as its natural resources endowment, availability of labour, local market size, infrastructure and government policy regarding these national resources.

An off-shoot of this location-based theory is the gravity approach to FDI wherein it was assumed that FDI flows between two countries is highest, if those two countries are similar geographically, economically and culturally. Gravity variables such as size, level of development, distance, common language and additional institutional aspects such as shareholder protection and trade openness were regarded as important determinants of FDI flows (Popovici & Calin, 2014). However, this is a basic approach to the economics of FDI, because FDI flows are more complicated than just being about commonalities between nations. Being close together geographically may reduce transportation costs, but not necessarily the cost of labour, for example. Also, sharing the same culture may not necessarily result in increased profitability or trade between the two countries.

Institutional FDI fitness theory

Developed by Wilhems and Witter (1998), the term FDI fitness focuses on a country's ability to attract, absorb and retain FDI. It is this country's ability to adapt, or to fit to the internal and external expectations of its investors, which gives countries the upperhand in harnessing FDI inflows. The theory itself attempts to explain the uneven distribution of FDI flows between countries. Institutional FDI fitness theory rests on four fundamental pillars – Government, market, educational and socio-cultural fitness.

At the base of the pyramid are socio-cultural factors which are the oldest and most complex of all institutions. Above that is education, which Wilhelms and Witter (1998) affirmed as being necessary in ensuring an attractive environment for FDI as educated human capital enhances research and development (R&D) creativity and information processing ability. The actual level of education does not seem to matter much for FDI as the requirements are dependent on the various skills needs of projects to be undertaken. However what is certain is that a basic education may impact on the productivity and efficiency of FDI operations, making formative education such as the ability to speak, hear, understand, interpret and implement instructions key for attracting FDI.

The third pillar, that of markets, accounts for the economic and financial aspects of institutional FDI fitness, in the form of machinery (physical capital) and credit (financial capital). Developed and well-functioning financial markets are a prominent feature in the MNC's investment decision-making process because they affect the economic and financial transactions of FDI projects.

The fourth and final pillar is the Government. The role of a country's institutional strength plays the biggest role in the FDI game. Government fitness requires the adoption of protective regulation to manage market fitness. Popovici and Calin (2014) added that Government fitness is considered to include economic openness, a low degree of trade and exchange rate intervention, low corruption and greater transparency. If policies are hostile and unfavourable towards investors, MNCs will shy away from such countries as the political instability increases the risk burden on their investments. (Wilhelms & Witter, 1998).

Wilhelms and Witter (1998) concluded that although the pyramid is represented in a specific order, the four institutional pillars in fact are inter-related and interact in unison in different forms. For example, Government policies shape markets, education and socio-cultural activities; market forces impact on the Government, education and socio-culture; education affects human capital and hence Government, markets and socio-cultural norms and practices; and finally, sociocultural systems are the origin of Government, markets and education, respectively (Wilhelms & Witter, 1998).

Interestingly, the theory of institutional FDI fitness has been empirically tested mainly in the African context. Musonera, Nyamulinda and Karuranga (2010) evaluated the institutional FDI fitness model in the East African Community bloc, using Kenya, Tanzania and Uganda as their sample, and data drawn from 1995 to 2007. They found that for Tanzania and Uganda, FDI inflows were pre-determined by more than a single country risk factor, such as population size, size of the economy, financial market development, trade openness, infrastructure and other economic, financial and political risks. Their research further refuted the perception that FDI inflows to Africa were enticed by natural resource endowment. This was evidenced by the results for Tanzania and Uganda, which were both resource-poor countries. However, both these countries were successful in attracting FDI on the strength and basis of their Governments fulfilling the following conditions: the establishment of macroeconomic and political stability, the introduction of an efficient regulatory framework, as well as the elimination of corruption.

Similarly, Muthoga (2012) investigated FDI determinants in Kenya for the period 1967–1999. The author found that economic openness, GDP growth rate, level of domestic investment, internal rate of return and availability of credit, all proponents of Government economic policies, enhance a country's attractiveness to foreign investors.

Microeconomic FDI theories

Lipsey (2004) asserts that the microeconomic view examines FDI motivations from the investor's perspective, which would be similar to taking a firm-level or industry-level perspective in making a decision. This micro-view thus examines the consequences to the investor, and to home and host countries, of the operations of the multinationals or of the affiliates created by these investments, rather than the size of the flows or the value of the investment stocks or investment position. These consequences arise from their trade, employment, production, and their flows and stocks of intellectual capital, measured by the capital flows and stocks in the balance of payments, although some proxies for the flow of intellectual capital are part of the current account (Lipsey, 2004). According to Das (n.d.), microeconomic FDI theories attempt to shed light on why MNCs choose to locate their subsidiaries where they do, and why they specifically

seek to penetrate those locations. Many of these microeconomic FDI theories are based on the existence of imperfect markets.

According to the firm-specific advantage theory, developed by Hymer (1976), the decision of an MNC to invest abroad rests on certain advantages at its disposal, such as access to raw material, economies of scale, access to labour, low transaction costs and intangible assets in the form of brands and patents. It is in fact a firm-level (firm-specific) decision, rather than a capital market one (Das, n.d.). Hymer's theory which laid the foundation in explaining international production was also supported by scholars such as Kindleberger (1969) in his imperfect markets model, Knickerbocker's (1973) oligopolistic reaction theory of following the market leader, the internalisation theory of Buckley and Casson (1976) in an international context, as well as Dunning's (1974) eclectic paradigm. These theories were based on the same fundamental principle – the existence of imperfect markets, which then had a bearing on firm behaviour. As a result, other than Dunning's eclectic theory, no further attention will be given to the other theories, as they are accounted for in Dunning's ownership, locational and internalisation (OLI) paradigm.

The eclectic paradigm

This is probably the most well-known theory of FDI. On his way to winning the world acclaimed Nobel prize, Dunning (1980) integrated various theories discussed above, being the international trade, imperfect markets (monopoly) and internalisation theories, and complemented these with the location theory, also briefly discussed above. According to Dunning (2001), in order for a firm to engage in foreign direct investment, it must simultaneously fulfil three conditions.

The firm should possess net *ownership* advantages over other firms serving particular markets. These ownership advantages are firm-specific and exclusive to that firm, in the form of both tangible and intangible assets such as trademarks, patents, information and technology, which would result in production cost reductions for the firm, enabling it to therefore compete with firms in a foreign country. These advantages were also emphasised by Hymer (1976) and Kindleberger (1969) in their market imperfections' theories on firm-specific and monopolistic advantages, respectively.

Secondly, it must be more profitable for the firm possessing these ownership advantages to use them for itself (internalisation), rather than to sell or lease them to foreign firms through licensing or management contracts (externalisation). Boddewyn (1985) refers to this as the internalisation condition. Finally, assuming that the preceding conditions are both met, it must be profitable for the firm to exploit these advantages through production, in collaboration with additional input factors such as natural resources and human capital, outside its home country; failing which, the foreign markets would then be served through exports, and local markets by domestic production. Location-specific factors have to be taken into consideration by the investing firms, as per the economic geography and institutional FDI fitness theories discussed under the macroeconomic FDI theories.

Boddewyn (1985) emphasised that the more a country's firms enjoyed ownership advantages associated with access to raw material, managerial expertise, tangible and intangible assets such as new and efficient technology, as well as brands and patents; the greater the incentive they had to internalise them. Also, the more profitable it was to exploit these ownership advantages outside their home country, then the higher the probability of engaging in FDI and international production. Because of the interrelatedness of the three conditions, it is important that they happen simultaneously, otherwise FDI cannot occur. The context and application of the Ownership, Location and Internalisation (OLI) paradigm differs from firm to firm, thus, the theory cannot be considered in isolation of theories which affirm the importance of the host country characteristics.

Although the eclectic theory was empirically tested by Dunning himself, it still has some limitations which critics have highlighted over the years. Boddewyn (1985) praised Dunning's theory for explaining the initial FDI decision by MNCs, but lamented the lack of explanation with regard to subsequent FDI increases, which may only require changes only in some but not necessarily all the OLI factors. In addition to this, Shin (1998) questioned the applicability of the theory to LDCs which generally do not possess monopolistic firm-specific advantages such as high knowledge content. Another criticism of the eclectic theory is that it incorporated so many variables that it ceased to be operationally practical as it did not explain FDI at the firm, industry and country levels. This was on the basis that Dunning attempted to combine several

complementary theories of market imperfection, which even on their own, are already fairly complex (Nayak & Choudhury, 2014).

To address these shortcomings, Dunning (1981) later came up with the Investment Development Path (IDP) theory, in which he proposed a link between a country's level of economic development and its investment positions. The IDP had four stages which followed a pattern similar to the product life cycle (PLC) theory (introduction, growth, maturity and decline). In stage one, there is no or limited FDI because the country currently offers no ownership or location-specific advantages such as an uneducated labour force, an undeveloped legal and regulatory framework and inadequate infrastructure, to warrant the establishment of an MNC. In the second phase, location-specific advantages in the host country start to emerge due to government macroeconomic policy intervention, hence attracting FDI inflows.

At the maturity phase, domestic firms enjoy ownership advantages, resulting in FDI outflows in stage three. This sees the improvement of competitive advantage for domestic firms, coupled with government support for local firms to explore international opportunities, resulting in an easing of FDI inflows. Finally in stage four, inward FDI declines and the host country becomes a net outward investor, reflecting the strong ownership advantages of its own domestic firms. Such firms often exploit their advantages from a foreign location, thereby becoming MNCs in the international market in the process. The underlying hypothesis here is that due to the dynamic interaction between a country's GDP and its economic policies, these both have the potential to affect both domestic and foreign firms' ownership advantages (Nayak & Choudhury, 2014). Despite these challenges, Dunning's eclectic theory however still remains the most recognised FDI theory.

Another criticism of Dunning's OLI paradigm was raised by Forssbaeck and Oxelheim (2008) when they questioned the menial role assigned to financial aspects in the FDI decision. In his defence, Dunning (1993) acknowledged the existence of a "financial asset advantage" which is a firm's knowledge of and access to foreign sources of capital, but pointed out that this was merely a by-product of the size, efficiency and knowledge of MNCs, and not necessarily a standalone advantage. Forssbaeck and Oxelheim (2008) argued that a strong financial strategy enabled a firm to minimise its cost and maximise availability of capital; thus by lowering the discount factor of any

investment, that firm's likelihood to engage in FDI increases as a result of the financial advantage. To this end, they posited that a firm will engage in FDI when it has access to competitively priced equity, when it cross-lists its shares on a larger, more liquid stock market, when it enjoys strong investment credit ratings, and when it is able to negotiate reduced taxation and/ or attract subsidies. Forssbaeck and Oxelheim (2008) empirically tested their hypotheses using a sample of 1379 European non-financial firms' international acquisitions. In their series of tests, they evaluated what effect including finance-specific variables, had on Dunning's OLI model, and found that there was a strong explanatory power of the financial variables, thereby concluding that financial factors are equally important in explaining FDI using the OLI model.

Having examined the available major FDI theories, it was clear that there was no single superior theory which comprehensively explains FDI. However, as it was necessary to conduct research from a specific theoretical background, adopting a similar approach to that Musonera *et al.* (2010), this study followed the theoretical framework of Institutional FDI Fitness of Wilhelms and Witter (1998) to explain the role of financial market development in FDI and FPI in the selected African economies being examined in this research. The proposed model was consistent with existing theories of international production, where inward FDI was dependent on host country characteristics. As such, the dependent variable represented the host country's inward FDI flows, while the independent variables were drawn from the pillars of Government, market and social fitness, as discussed above, of which domestic financial markets play a central role.

2.3.3 Earlier empirical studies

Various scholars have undertaken studies to understand the driving forces behind FDI inflows. In 2004, Anyanwu and Erhijakpor studied trends and determinants of FDI in Africa. They observed that infrastructure and trade openness had a positive influence on FDI inflows; while credit to the private sector, export processing zones and capital gains tax in fact shunned FDI away from Africa. Asiedu (2006) also examined determinants of FDI to Africa. She found that natural resource endowment, good infrastructure, low inflation and efficient legal systems attract FDI to Africa, while corruption and political instability have a negative impact. Bokpin, Mensah and

Asamoah (2015) also assessed the relationship between FDI and natural resources in 49 African countries from 1980 – 2011, using GMM. They found that the comprehensive index of natural resources (total natural resources scaled by GDP) had a positive and strongly significant (at 1%) effect on FDI inflows for all countries in their sample, but this impact was dependent on the specific measure applied when decomposed into the various rents. Other scholars who concluded the positive and significant impact of natural resources on FDI include Dupasquier and Osakwe (2006), Hailu (2010) and Anyanwu and Yameogo (2015).

With regard to the role of financial market development in Africa, Agbloyor *et al.* (2013) observed the effect of the banking sector in 42 African countries and the stock market in 16 African countries, respectively. They found that an advanced banking sector leads to more FDI inflows, and also that increased FDI inflows result in further development of the banking sector. Similarly, economies with developed stock markets were better poised to absorb more FDI inflows, with higher inward FDI inflows spurring the development of domestic stock markets.

Internationally, evidence presented pointed to the importance of the level of schooling of human capital, degree of openness and inflation as being leading determinants of FDI. This was confirmed in the empirical study of 38 developing countries, conducted by Nonneberg and Cardoso de Mendonca (2004). Furthermore, Zheng (2009) found that inward FDI to China and India is influenced by domestic market growth, imports, cost of labour, and political risk. Leitaio (2010) surveyed Greece using data from 1998–2007 and found that similar to Zheng's (2009) results, trade openness, market size and labour costs were significant FDI determinants. The influence of financial market development was considered by Al Nasser and Gomez (2009), wherein their results reaffirmed the positive relationship between FDI and stock market development, as well as a significant and positive correlation between FDI inflows and credit offered by banks to the private sector.

The above discussions on foreign direct investment further justify the need to investigate further the status of FDI in African countries. These African economies no doubt may present results somewhat different from those of other developed and

developing countries, primarily due to the less developed financial markets for instance, and correspondingly poor investment promotion policies.

2.4 Foreign portfolio investment

2.4.1 Definitions of foreign portfolio investment

According to Wilkins (1999), foreign portfolio investment (FPI) is a financial investment in debt or equity. According to her, all equity is long-term in nature, as is all debt older than a year. Hence, we can affirm that FPI is actually a long-term investment, as defined by the instrument and not necessarily how long the investor participates (Wilkins, 1999:56). Foreign portfolio investment (FPI) is considered to be stock (share) and/ or bond purchases that do not create a lasting interest in or effective management over an enterprise (World Bank, 2004).

Another definition of FPI is that it is non-FDI cross-border investment in equity and debt securities (IFS, 2000). Foreign portfolio (dis) investment (FPI) therefore simply involves the (selling) purchasing of a share of any entity (United Nations Conference on Trade and Development, UNCTAD, 2008). In their study on FPI determinants in Nigeria, Ekeocha, Ekeocha, Malaolu and Oduh (2012) defined FPI as a component of international capital flows, which involved the transfer of financial assets such as cash, stock or bonds across international boundaries in search of profit. FPI can be further decomposed into equity foreign portfolio investments (EFPI), debt foreign portfolio investment and flows in financial derivatives. (World Bank, 1998).

For the purposes of this research, FPI was used to refer to all inward foreign financial investment flows which were temporary in nature, primarily targeted at financial assets available in the local financial markets, and did not necessarily culminate in permanent investments. FPI however does assist in the availing of additional, alternative financial capital resources for the further investment in the physical, human and social capital of an economy, hence our interest in this international capital flow.

2.4.2 Theoretical background

The history and origins of FPI theory

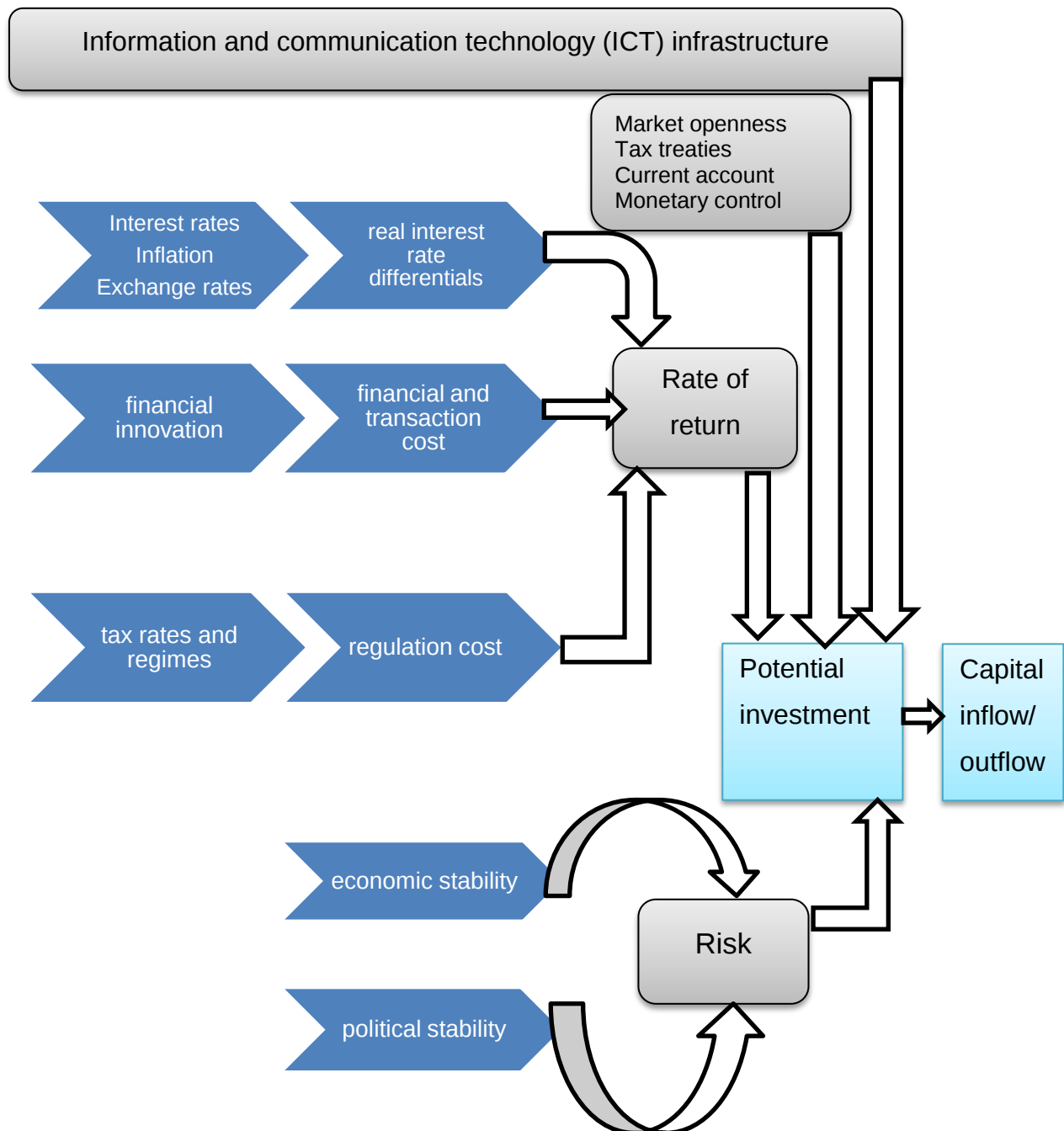
Siamwalla, Vajragupta and Vichyanond (1999) affirmed that increases in FPI flows were in tandem with globalisation of trade, increased international financial linkages as expansion of production overseas. In one of many earlier works, Dunning and Dilyard (1999) advanced the argument of FPI actually preceding FDI. According to them, European institutions made investments in the United States of America by either giving loans to, or acquiring minority equity stakes in American firms, and also through loans and holding minority equity stakes in publicly-owned utilities or privately-owned railroads (Dunning & Dilyard, 1999:5). Similar to the product life cycle, the American economy matured, resulting in its own capital markets becoming increasingly sophisticated to absorb the FPI inflows by European investors.

Wilkins (1999) highlighted that early literature perceived “capital” movements as being inferior to trade transactions as evidenced by the fact that they were regarded as a “balancing item” in the national BOP accounts. In her discussion on the theory of capital movements, Wilkins (1999) was of the opinion that many early writers such as Ohlin (1933), Iversen (1936) and Heckscher-Ohlin-Samuelson and Kemp-Jones (1962) tried to explain capital movements, making the assumption that in the absence of impediments (perfect markets), financial capital would go where returns were highest. However, others such as French and Poterba (1991) and Gokkent (1997) took into account “home bias” and found that investors hold a large proportion of domestic assets in their portfolio. This would not be the case if capital was fully mobile. In their empirical study, Kang and Stulz (1997) found that FPI in Japanese firms was largely concentrated in larger firms because foreign investors have limited access to information to assess smaller firms, compared to their domestic counterparts. This information asymmetry naturally resulted in home bias.

Figure 2.3 illustrates the relationships between the different determinants of international portfolio capital flows. According to Gumus, Duru and Gungor (2013), unlike FDI flows, FPI is affected by several macroeconomic factors, primarily through their interaction with the financial markets. Earlier empirical studies confirmed that FPI was influenced by interest rates, foreign exchange rates, inflation rates, economic growth, government consumption, country risk, political risk, transaction costs and rates of return.

According to Sarno, Tsiakas and Ulloa (2015), the global economy is evolving, and with a high degree of international capital mobility, FPI flows now exert a significant effect on domestic asset prices. They exemplified this using how a surge in FPI inflows could lead to a real estate boon and inflation, whereas a sudden halt could result in slow economic growth, higher interest rates and currency depreciation. As such, understanding FPI determinants can assist economies to formulate appropriate macroeconomic policies targeted at managing the size, direction and volatility of these international capital flows.

Figure 2.3: Inter-relationships of international portfolio capital flow determinants



Source: Adapted from Gumus, Duru and Gungor (2013:216)

Theories of FPI

Portes and Rey (2005) lamented the lack of literature on the theory of international trade in assets, particularly securities. According to Goldstein and Razin (2006), international equity flows were the main feature of the recent globalisation of capital markets in both developing and developed markets. While the theory of foreign investment was basically the theory of international portfolio or indirect capital movement up until the early 1960s, the theory of FPI has traditionally been drawn on macroeconomic variables, primarily interest rate differentials and exchange rate fluctuations (Dunning & Dilyard, 1999).

By extending the eclectic paradigm as discussed above with regard to FDI theories, Dunning and Dilyard (1999) attempted to explain two issues: the level and pattern of long-term FPI and the choice between FPI and FDI. They asserted that money sought higher interest rates and higher profits, as per the essentials of any investment decision. Dunning and Dilyard (1999) attempted to use microeconomic and strategy-related theories of FDI to explain FPI by modifying the OLI paradigm. Each variable in the Ownership, Locational and Externalisation (*OLE*) paradigm is grounded in the theory of FDI, portfolio capital movement and locational economics. The new paradigm for FPI became *OLE* (Ownership, Location and Externalisation). Their argument was that usually “O” variables are already present, so the choice of outlet for FPI depends on “L” and “E” variables.

With regard to ownership “O” specific advantages, Dunning and Dilyard (1999) affirmed that in order to undertake investment, the investor or lender should have the capital to engage in such activity, and should also have sufficient information about the prospective firm in which it intends to invest. Both conditions are essential to be fulfilled prior to making the financial commitment, and after weighing alternative options in terms of the risk and return profiles of the available opportunities. The location “L” specific advantages need to be considered from the perspective of how they impact on the profitability of the recipient firm rather than the investor. However, the investor in this case is more concerned with ensuring a worthwhile rate of return (e.g. interest earned, dividends and capital gain on equity) on their investment. Financial market liberalisation in emerging and developing economies has increased FPI location options (Dunning and Dilyard, 1999). Other location aspects which are

taken into consideration are the host nation's political stability, level of financial market sophistication and government macro and microeconomic policy. Information also plays a very significant role because the investor must be well-versed with the institutions and regulations (e.g. tax, dividend, foreign participation, and so on) of their chosen destination.

Finally, externalisation justifies the use of external markets rather than internal ones for the transfer of capital. Externalisation plays a supporting role to ownership and location advantages in that it is responsible for consolidating investment decisions based on identified benefits such as lower transaction costs, and correlation of return with other markets, particularly home country ones. This is essentially the opposite of "home bias", as it accounts for the placing of capital in different countries and industrial sectors which investors are not familiar with (Dunning & Dilyard, 1999). It can hence be concluded that FPI is pursued via externalisation whereby international capital markets are used to take full advantage of ownership and location characteristics peculiar to investor firms. Such an outreach also results in the further development of other financial markets, thereby increasing foreign portfolio investment avenues and opportunities, which in turn attracts even more volumes of inflows.

Dunning and Dilyard (1999) suggested that the theory of FPI is located within international economics, and drawn on macroeconomic financial variables, notably interest rates and exchange fluctuations. Hence, it is expected that financial resources will flow from capital-rich countries to poor ones, in pursuit of the higher rate of return. On the contrary, in his PhD thesis, Gokkent (1997) explained FPI using the portfolio theory, alternatively referred to as the risk diversification rationale. Branson (1974), as cited in Gokkent (1997), applied modern portfolio concepts to international capital flows, suggesting that FPI occurred as result of investors' needs to diversify their portfolios, rather than as a result of interest rate of return differentials. Bartram and Dufey (2001) are of the opinion too that international financial investments are not only subject to currency and political risk, but also institutional factors such as respect for the rule of law, property rights and tax issues. In support of these views, Goldstein and Razin (2006) also reiterated the notion that FPI is motivated by yield-seeking and risk-reducing activities that are achievable through portfolio diversification.

Therefore, advantages of international capital markets, other than internalising markets, can be defined in terms of portfolio structure and investor attitude towards risk, that is, diversification (spreading of risk) by means of an international rather than a national portfolio (full home bias). Gokkent (1997) however also emphasised that currency risk is the strongest advocate for home bias. On the other hand, dissenters of Gokkent's (1997) view have argued that currency risk should have minimal influence on FPI due to the existence of the purchasing power parity (PPP), since spot exchange rates will quickly adjust to price differences. However, empirical studies have proven that PPP does not hold, hence currency risk remains influential on FPI decisions.

Another school of thought classified FPI theories into push factor and pull factor theories. According to Calvo, Leiderman and Reinhart (1996), push factor theories were those that gave credence to the direction of capital flows to global market activities in terms of cyclical movements in international interest rates, business cycles in industrial economies and the growing inclination in favour of international diversification. This thinking is in line with proponents of international finance regarding the relationship between capital movements and interest rate differentials (Ahortor & Olopoenia, 2010).

On the other end of the spectrum are pull factor theories which highlight the importance of the domestic economic environment. Sarno *et al.* (2015) explained pull factors as the domestic economic forces that pull capital into a country, thereby reflecting the attractiveness of various investment destinations. These characteristics include high domestic interest rates, low domestic inflation, high productivity capital, increased integration of domestic capital markets with global ones, high growth potential and trade openness, as well as the adoption of sound domestic macro (fiscal) and micro (monetary) economic policies (Sarno *et al.*, 2015; Agenor & Montiel, 1999; Sharma, Ul-Haque & Mathieson, 1997; Calvo *et al.*, 1996). Using these push-pull perspectives, the following possible theories of FPI emerge: the return and creditworthiness model (RCM), the international capital asset pricing model (ICAPM), the money demand and productivity (MDP) framework, and lastly, the portfolio allocation model (PAM).

The return and creditworthiness model (RCM) breaks down determinants of FPI into domestic and global categories. Domestic factors can be further decomposed into those which give a level of expected return as a function of the net flows, and

creditworthiness of the host country measured by the end-of-period liabilities stock. The ICAPM assumes that rational investors purchase market indices of domestic and foreign equities, thereby offering the investors portfolio rebalancing in line with changing market conditions. According to the money demand and productivity model (MDP), capital flows show co-movement with adjustments in the money demand function, domestic capital productivity and international interest rates. Hence, an upward shift of the money demand function, plus increases in domestic capital productivity would generate capital inflows, all things equal, and vice-versa. Finally, the portfolio allocation model (PAM), a dynamic optimisation model in which investors strive to maximise the present value of their utility from the expected return on a portfolio of assets, states that capital flows are dependent on risk and return, portraying positive reactions to rates of return, and negative reactions to risk (Ahortor & Olopoenia, 2010).

A little more focus is given to the emergent theory used to explain FPI: the international capital asset pricing model (ICAPM). In its standard application, CAPM is used to analyse prices of securities in domestic financial markets. According to Bartram and Dufey (2001), the international version of CAPM adds a risk premium on the global market portfolio and the relevant currencies. The ICAPM explained FPI from the portfolio rebalancing effect and return-pursuing motive, by assuming that investors buy market indices of domestic and international equities (Ahortor & Olopoenia, 2010). The international capital asset pricing model assumes that investors however still use principles of risk and return in their home currencies, when making investment decisions. The shortcomings of ICAPM are that a real risk-free rate of return does not exist because of exchange rate risk resulting from deviations from PPP. Also, a global market portfolio is difficult to construct because financial markets are largely segmented (hence asset pricing is very complex), investor risk preferences differ, and expected risk and return varies over time (Bartram & Dufey, 2001).

However, as with any theory, limitations do exist as no theory is perfect. The international economics theory, for example, assumes that FPI flows are uni-directional, yet empirical evidence proves that FPI flows are actually both inward and outward (bi-directional) (Gokkent, 1997). In addition, it also assumes extreme portfolio specialisation, e.g. full home bias in countries where the real domestic rate of return

is higher. Gokkent (1997) further highlights that modern portfolio theory on the other hand does not account for home bias, and empirical studies provide no evidence of diversification being the main reason for capital flows (FPI in this case), as found by Tesar and Werner's (1992) survey on American and Canadian portfolios.

2.4.3 Earlier empirical studies

Empirical evidence which highlights determinants of FPI flows has received less consideration in international macroeconomic studies (De Santis & Luhrmann, 2009). The available literature on the other hand is mainly conducted in emerging market economies (Calvo *et al.*, 1996; Fernandez-Arias, 1996; Chuhan *et al.*, 1998; Bekaert *et al.*, 1999). In order for an investment destination to look attractive to potential investors, certain attributes must be in place. Among these are sound institutions and good (corporate) governance principles, as well as developed local financial markets.

Bartram and Dufey (2001) confirmed that FPI is driven by a divergence in the populations developed and developing countries. According to them, mature industrialised countries are characterised by aging populations with great needs for private capital accumulation. On the other hand, developing countries with younger populations need persistent and high levels of investment in order to create employment, as well as improve standards of living. Bartram and Dufey (2001) are supported by De Santis and Luhrmann (2009), who in their study also noted that the demographics of a country can also impact on its savings and investment profile. They found that countries with relatively high youth and old age populations are characterised by lower current account balances (in the BOP) and net FPI flows, and this was consistent with the life cycle theory. This is because the youth and the elderly are at stage 1 (initial phase) and stage 4 (maturity phase) of the life cycle – and both do not have a high savings and investment rate. Rather, they have just enough money to survive.

The life cycle theory of saving (investing) and consumption, is the work of Modigliani and Brumberg from the 1950s. According to Bodie, Treussard and Willen (2007), the life cycle theory teaches people to view financial assets as avenues for transferring resources across different times and outcomes over our life, from the young adult

phase through to post-retirement age. The life-cycle theory can hence be considered to be one in which the wealth of the nation gets passed around, wherein the very young have little wealth, middle-aged people have more, and peak wealth is reached just before people retire. Post-retirement, the elderly sell off their assets to provide for food, housing, and recreation in retirement. The assets shed by the old are taken up by the young who are still in the accumulation part of the cycle, and the life cycle starts over again (Deaton, 2005). The life cycle theory follows a similar path to the previously discussed product life cycle and the investment development cycle used to explain FDI behaviour, as well as to explain FPI trends above.

On the determinants of international trade in assets, Portes and Rey (2005) sought to understand whether the determinants of portfolio composition say anything about stocks. They found that market size, efficiency of technology and distance are important determinants of cross-border equity flows (FPI). Linked to the Portes and Rey study was the research by Daude and Fratzscher (2008) which was determined to establish if foreign investment (in general, thus including FDI, debt, FPI equity and FPI debt) followed a “pecking order” with regard to the composition of flows. Although focusing on the role of information frictions and the role of institutions, an additional theme to their paper studied the impact of financial market development on the pecking order of cross-border investment positions.

Daude and Fratzscher (2008) found that the share of inward FDI and loans is highest for countries with weak institutions and poorly developed capital markets, because investors’ perceptions of such economies were that their investments would be more secure in the form of “brick and mortar” or secured loans backed by collateral as opposed to mere equity securities. In these countries with poorly developed financial markets – FDI was the only avenue of investing in the economies of such countries. Their findings further highlighted the importance of strong regulatory institutions, which are a requirement to establish and bring domestic stock markets in line with international standards to be able to attract FPI inflows. Although FPI is highly sensitive and reactionary to information, liquid and easily reversible; it can bridge the financing gap in the local economy for both domestic and international firms.

Other empirical studies on FPI determinants were conducted by Aggarwal, Klapper and Wysocki (2005) who assessed influencing factors of actively-managed American

mutual funds after the Asian financial crisis. They found that the American institutions invested more of their funds in open emerging markets characterised by strong investor protection, legal framework and accounting standards. Gordon and Gupta (2003) studied FPI trends into India. They found that domestic, regional and global factors largely influence FPI inflows to India. Following their regression analysis, they found that LIBOR (proxy for international interest rates) had a significant negative influence of FPI to India, as did the lagged domestic market return. They also concluded that credit rating downgrades stunted FPI inflows to the country.

Errunza (2005) re-examined costs and benefits of FPI from the host country perspective by considering the interactions between FPI and market development, degree of capital market integration, cost of capital and market volatility. From his findings, there was strong evidence for future policy formulation based on preconditions for capital market opening, market regulation and financial liberalisation sequencing. Agarwal (1997) using the economies of six Asian countries, found that inflation, real exchange rate, economic activity index and share of domestic capital market in the world stock market capitalisation were all statistically significant FPI determinants; while FDI, foreign trade and current account deficit were insignificant. These findings were important as they gave credence to this study.

Although various empirical studies have been done in this area, it is not easy to generalise the findings. As with location-based theories of FDI, the FPI studies find a strong relationship between FPI inflows and familiarity, as measured by geographical distance, common language and trade (Roque & Cortez, 2014). Familiarity is closely followed by corporate governance and host country market size and level of development. These three determinants can hence be considered to be the leading primary attractions which draw FPI-investors to specific host countries outside of their own home countries.

2.4.4 Benefits and shortcomings of FPI

On the upside, policies that attract FPI are being promoted in many developing countries. This is because FPI provides opportunities for real economic growth, as well as potential social, economic and political development, including job creation,

reduced cost of capital for domestic companies, forced compliance with transparency and corporate governance and capital market integration. This is achieved by the host country through benefits yielded from the greater diversification of financial resources available, often directed to the stock market, thereby providing even domestic firms with a new and alternative source of capital, at a reduced cost (Sawalha, Elian & Suliman, 2016). Other advantages of FPI are that due to its high risk, FPI-investors often demand higher transparency in corporate governance and legal protection. If these expectations are met, they result in enhanced investor confidence. According to Sawalha *et al.* (2016), these features make FPI a prominent driver for improvements in domestic financial infrastructure, this paving the way for countries to attract longer term FDI inflows.

Investors consider other risks such as those pertaining to investor rights for example, in making an informed decision on where their money goes. Investment policies, which encompass institutional quality, need to put investors' minds at ease that they will have access to their funds after the investment horizon. Since FPI is generally short term in nature, its impact will not carry over in a country's long term national accounts. However, there are some risks which potential investors may encounter in their quest to embark on international portfolio investment through FPI such as taxation, exchange controls, capital market regulations, and even high transaction costs (Bartram & Dufey, 2001).

Various other studies conducted highlighted additional barriers to FPI. Eun and Janakiraman (1986) lamented the controls imposed on foreign investors by host country Governments. These restrictions often take the form of limits of equity shareholding and repatriation of capital and dividends. Bekaert (1995) argued that poor credit ratings by agencies, variable inflation, imposed exchange rate controls, poor regulatory framework and the limited size of stock markets in some emerging markets serve as a hindrance to potential foreign portfolio investors. Poor quality institutions, high taxes and transaction costs are also considered to inhibit the freedom of foreign investors to bring in the much sought-after capital from abroad (De Santis & Luhrmann, 2009; Levine & Zervos, 1996; Rowland, 1999).

Another criticism of FPI, particularly towards developing countries, is that the risk of reversal, withdrawal or disinvestment of this type of flow is significantly higher than

that for FDI. This action would therefore be detrimental to the host country in terms of exchange rate and/ or interest rate volatility. The worst case scenario would be that a sudden FPI disinvestment, coupled with a slow reaction from the Central Bank authorities, could give rise to a balance of payments crisis (Agarwal, 1997).

Besides the instability characteristic of FPI inflows, Agarwal (1997) augments his earlier assertions by stating that some host countries are also cautious of hostile takeovers of domestic firms resulting from unabated share purchases by foreign investors. Although foreign portfolio investors are often passive investors, their presence in the domestic stock market often results in an increase in share prices, without a necessarily corresponding contribution to real investment. Sometimes, the capital inflow from FPI can be easily cancelled out by an outflow of dividends, and repatriation of capital. However, this is rarely the case as dividends declared are barely significantly high enough to warrant this concern.

Calvo (1998) also concluded that high negative swings in capital inflows, also known as 'sudden stops' are dangerous for economies, as they tend to result in firm bankruptcies, and the interference of human capital and local credit channels. Equally, short term financing may add to these inherent risks insofar as they contribute to the generation of capital outflows or slowdowns in capital inflows. This would result therefore in an increase in current account deficits which would require new money, which is however more difficult to harness during periods of sudden stop. International capital inflows, including capital repatriation, would not ease the situation. Although capital account fluctuations are often blamed on short term international capital flows in the form of FPI, it is in fact domestic capital flight that tends to compound sudden stops in emerging market economies, as was the case in Argentina and Mexico in the early 1990s (Calvo & Reinhart, 1999).

Errunza (2001) added supplementary drawbacks of FPI as follows:

- a) Capital market liberalisation is unlikely to boost long-term economic growth since the domestic capital stock is relatively unimportant and large capital inflows would not materialise. Ahmad *et al.* (2004) reiterate this point by highlighting that FPI is that investment option utilised by foreign investors with a short-term payoff

view. As a result, this increases FPI's volatility hence such inflows cannot ensure sustained economic growth.

- b) FPI increases market integration and hence co-movements. The implication of this would be that a major move in one emerging market would affect other emerging markets, regardless of fundamentals. This indeed was seen during the 2007/2008 global economic crisis.
- c) High correlations during bear markets lead to contagion.
- d) FPI is less stable than other types of foreign investment flows, thereby increasing the volatility of domestic returns. There is however no theory to support this, only empirical evidence (Errunza, 2001).

Despite the seemingly strong arguments against FPI, we still believe that Africa has many developing countries which would benefit not necessarily financially, but also in terms of institutional and regulatory strengthening. If concerted efforts were also made to develop their domestic financial markets to attract FPI, this would of course provide an alternative avenue to raise additional capital for MNCs already in the host country.

2.5 Financial market development

According to Karacadag, Sundararajan and Elliot (2003), policies aimed at developing financial markets need to be carefully sequenced, taking into account the overall objectives and likely impacts of the intended action. They assert that the domestic investor base should be a home-grown initiative, and savings must be encouraged. The overarching strategy is to eventually have a well-functioning capital market, which will then be able to attract international investors, in the long run. As such, developing domestic financial markets is a gradual, systematic process which needs to occur concurrently with institutional reforms of good governance and risk management controls (Karacadag *et al.*, 2003).

2.5.1 Definitions of financial market development

According to Errunza (2001), local capital market reforms and the relaxation of capital controls to attract FPI, has become an integral part of economic development strategy. There has been a notable increase in financial market development over the past three decades due to the adoption of conducive investment attraction policies. Well-functioning financial markets are the backbone of any economy. Bartram and Dufey (2001) also added their voice as to how and why removing regulatory barriers between countries, a lower cost of communication, travel and transport have all resulted in a higher degree of market integration. They believe that cross-border flows of financial assets (FPI) has actually outpaced trade in goods and services (FDI), not only due to technological advancements, but also as a result of policy-induced capital market liberalisation (Bartram & Dufey, 2001).

According to Gitman *et al.* (2010), a financial market is simply a market for financial instruments in which buyers and sellers meet to create an exchange for financial assets. In other words, it is a system which facilitates the flow of funds from excess entities to those with deficits, in search of higher returns while also reducing the costs of information and transactions.

The term “financial market development” (FMD) is frequently used in literature, but to date, there is no consensus on its precise definition. Loosely applied, Soumaré and Tchana (2015) concur that FMD is simply a well-functioning financial sector or market liberalisation. Earlier authors have defined the concept according to its application in the context of their studies, mainly influenced by the availability of data. For example, Chinn and Ito (2005) described financial development – as measured by activity of the stock market – as being dependent on capital account openness individually as well as with interaction with the level of legal development. They applied financial market size variables of private credit over GDP, stock market capitalisation and stock market total value, as proxies for FMD.

Mendoza, Quadrini and Rios-Rull (2007) had a legal perspective on financial development in that they considered it to be characterised by the extent to which financial contracts are enforceable. Financial development, sometimes referred to as financial modernisation, was applied by Hartmann, Heider, Papaioannou and Lo Duca

(2007) when referring to the process of financial innovation, as well as institutional and organisational improvements, in a financial system that: (i) reduce asymmetric information, (ii) increase completeness of markets, (iii) add possibilities for agents to engage in financial transactions through (explicit or implicit) contracts, (iv) reduce transaction costs and (v) increase competition. The latter definition emphasised more the functions of developed financial markets.

According to the World Economic Forum (WEF, 2012), financial development is measured by variables such as size, depth, access, efficiency and stability of a financial system, including its markets, intermediaries, assets, institutions and regulation. There is a general consensus that the size of financial markets, as measured by the total financial assets in a country, determine savings and investment. The effects of financial intermediation and financial markets on economic growth is magnified through capital accumulation, i.e. the rate of investment, as developed financial markets result in higher mobilisation of savings amongst locals.

However, it is Dorrucci, Meyer-Cirkel, and Santabárbara (2009) who provided two key definitions of financial market development – one theoretical and the other empirical. The theoretical definition is grounded in the theory of complete markets. The OECD (2003) defined a complete financial market as being that market where there is an equilibrium price for every asset, in every possible state of the world. Gulko (2008) also reiterated this by asserting that a financial market is complete when there are contracts to insure against all possible eventualities. Lastly, Jensen (2011) further simplified the concept of complete financial markets by affirming that this exists when one can purchase any securities whose payments are dependent on the future state of the economy.

Accordingly, Dorrucci *et al.*'s (2009) theoretical definition for a developed domestic financial has come to be used to refer to a situation whereby complete markets fulfil three conditions: (i) there is an equilibrium price for every asset in the world, (ii) there are assets available to mitigate adverse shocks, and (iii) the presence of other factors such as transparency, competition and the rule of law which enhance market completeness. Empirically, domestic financial market development is the ability of a country to allocate savings to investment projects efficiently and effectively within its borders due to (i) the quality of its institutional and regulatory framework, (ii) the size

of its financial markets, diversity of its financial instruments, as well as (iii) the performance of the financial markets in terms of efficiency and liquidity (Dorrucci *et al.*, 2009).

The main contribution of this study lies in the investigation of the role of domestic financial market development in the attraction of FDI and FPI to the host African countries. According to Hearn, Piesse and Strange (2010), stock market development facilitates both FDI and FPI. This is achieved through the acquisition of shares in local firms, thereby supplementing low levels of domestic savings. Agbloyor *et al.* (2011) add that for African studies, it is imperative to also examine the role of credit markets. Since the banking sector in Africa is much more developed than the equity markets, a significant amount of inward foreign investment is intermediated by banks rather than the stock markets. Hence, while stock markets provide equity finance for investment, the banking sector provides debt finance mobilised at low cost, thereby implying a complementary relationship between the two (Agbloyor *et al.*, 2011). It is on this basis therefore, that this study encompasses both stock market development, as well as banking sector development.

From the ongoing discussions, the working definition throughout this study for “financial market development” (FMD) will therefore encapsulate the extant components of domestic financial markets, which are regarded as the conduits for channeling surplus international funds, as well as to raise additional credit and/ or equity capital in the banking sector and/ or the stock market platforms by foreign investors. Due to the lack of depth in financial market development in Africa, and therefore data, with the exception of South Africa which is active in all forms of the named financial markets, our study is restricted only to the bank credit and stock (equity) markets.

2.5.2 Theoretical background

According to Schumpeter (1912), financial sector development affects the allocation of savings, improves productivity and technological growth, and hence improves economic growth. This theoretical framework was captured in a simplistic model in Figure 2.2 earlier in the chapter. This view is still held almost a century later as seen

in Alfaro, Chanda, Kalemli-Ozcan and Sayek (2004), who, in examining the role of financial market development (FMD), note that countries with more sophisticated financial markets are more likely to also gain from FDI inflows, as well as FPI. At the industry level, Rajan and Zingales (1998) found that the state of financial development reduces the cost of external finance to firms, thereby promoting growth. Combining industry and country level data, Wurgler (2000) illustrated that even if financial development does not lead to higher levels of investment, it seems to allocate the existing investment better and hence promotes economic growth.

It is also worth noting that Agbloyor *et al.* (2014) further elaborated on the above theoretical framework on financial market development. They prefer that financial markets allocate savings, which can also be partially drawn from foreign capital flows, as well as enable financial innovations introduced by foreign firms' technology. As per the model, it is these foreign capital flows which enhance capital accumulation and technological diffusion, thereby promoting economic growth. More specifically, the role of financial markets is to facilitate the liquidity and tradability of assets, provide alternative avenues for risk diversification, reduce information asymmetry, enhance savings mobilisation and the attraction of foreign capital, as well as improve corporate governance of firms (Agbloyor *et al.*, 2014).

In their framework for financial market development, Chami, Fullenkamp and Sharma (2010) stated that developed markets, when they function properly, allow the transfer of resources from those savers with excess funds to investors. According to the Bank of Thailand (2014), the objective of financial market development is to enhance the capability of a financial market to perform its intermediary role efficiently. An efficient developed financial market is therefore one that, on the supply side, offers investors a wide array of financial assets to meet their differing risk appetites, while on the demand side, has a sizeable investment demand from different investors.

Market depth considers the quantity or volume of financial assets sold on the market, and is often used as a barometer for liquidity in that market. The depth of financial markets is a measure of their strength. Deep financial markets are inherently less fragile than shallow financial markets, hence could be more attractive to FPI investors. In this case, depth refers to the liquidity of the market. Therefore, financial market depth is a good indicator of how sophisticated a financial system is. Specifically, depth

deals with issues related to liquidity, or how efficiently the financial markets are able to absorb large volumes of trade without significant impacts on security or asset prices.

According to Alfaro, Chanda, Kalemli-Ozcan and Sayek (2010), several empirical literature findings seem to suggest that a country's capacity to take advantage of foreign capital flows' externalities might be highly determined by local conditions, such as the development of local financial markets or the educational level of the human capital in that country, i.e. the absorptive capacities. In their study, they theoretically extended the McKinnon (1973) view, and argued that the lack of local financial market development can hinder an economy's ability to enjoy potential FDI spillovers. In their empirical model, they hypothesised that the more developed the local financial markets, the easier it is for credit-constrained entrepreneurs to start their own firms. However, they assumed that in the presence of imperfect credit markets, the initial capital outlay ought to be financed by domestic borrowings; but domestic financial institutions themselves have limited resources and so pass on the high cost of finance to the entrepreneurs. As a result, backward linkages between foreign and domestic firms are crucial, while developed financial markets could then magnify FDI spillovers (Alfaro *et al.*, 2010).

Schumpeter (1912), Goldsmith (1969), McKinnon (1973) and Shaw (1973) advocated that well-functioning financial markets, by reducing transaction costs, facilitated capital allocation to projects that yield the highest returns and therefore enhanced growth rates. Errunza (2001) studied the role of capital markets in economic development, and the relationship between market development and economic growth. By conceptually extending the Shaw-McKinnon framework, Errunza (1974; 1979) argued that as markets develop, specialised institutions and instruments, improved liquidity and further opportunities for diversification would result in increased savings rates and capital accumulation. He reached the conclusion that a well-functioning local market is a pre-condition for attracting FPI into emerging markets. This study seeks to establish whether the same conclusions will be reached for countries in Africa which are primarily characterised by under-developed financial markets. Errunza (2001) later highlighted that while FPI makes significant contributions to the development of domestic capital markets, external financial liberalisation should not precede domestic

reforms because there would not be adequate domestic financial infrastructure, that is, a well-regulated banking system. This was the case prior to the Asian crisis of 1996.

Economic theory dictates that the minimisation of information and transaction costs are the main role of financial markets. Work by Schumpeter (1912), Goldsmith (1969) and McKinnon (1973) all help to describe the role of financial systems. Primary functions of financial markets are mainly to facilitate the transfer, management and diversification of risk, the allocation of capital, the ex-ante production of information about real investments and the allocation of capital, the monitoring of investments, mobilisation and pooling of savings, creation of liquidity, and the easing of the trade of goods, services and financial contracts (UNECA, 2008; Levine 2005).

Developed financial markets are often characterised by efficiency and depth. According to the United States Agency for International Development (USAID, 1998), the depth of a financial market measures its strength as indicated by the ratio of broad money supply (M3) to GDP. A low ratio suggests that the formal financial system is a poor mobiliser of funds, hence combined with strong demand for funds by the public sector, a low ratio makes credit to the private sector very scarce (USAID, 1988). In many developing countries, formal financial markets are shallow, implying that relatively few people have access to these markets, and the range of available financial instruments is limited.

Ncube (2007) asserted that the financial sectors in SSA are characterised by limited financial products and financial innovation, wide interest rate spreads, weak legal systems and pronounced market fragmentation. With the exception of the South African market, and to a limited extent the North African markets, African stock markets are characterised by fragmentation with very low capitalisation and liquidity levels (UNECA, 2008). Liquidity is simply the rate and ease at which an asset can be converted into money at agreed prices. Groosman and Stiglitz (1980) explained that larger, liquid markets allow agents to profit from information by reducing the resources required to acquire that information. Well-functioning stock markets are an ideal example of this as share prices are published and updated regularly on a daily basis.

2.5.3 Earlier empirical studies

Several cross-sectional studies have been conducted to determine the importance of well-functioning financial markets on foreign capital inflows that stimulate economic growth rates. Ang (2009) investigated the role of financial market development on foreign capital inflows and economic growth in Thailand, and found that an increased level of financial development enables the Thai economy to obtain more from foreign capital inflows. Ang (2009) however noted that the effect of FDI, for example, on a country's economy, is dependent on that country's absorptive capacity. In order to capture this in his paper, Ang (2009) proxied financial development as being measured by the economic indicators of the M2 to GDP ratio, as well as domestic credit to private sector as a percentage of GDP.

Choong and Lim's (2009) study on Malaysia using a dynamic endogenous growth function that included the impact of FDI and financial sector development with locational determinants, found that the interaction between FDI and financial market development has a significant impact on Malay economic growth. Following their assessment of Pakistan, Shahbaz and Rahman (2010) concluded that the impact of foreign capital inflows on an economy can be improved through further financial market development.

Along similar lines, Montiel and Reinhart (1999) argued that financial market development is a key pull-factor in so far as international capital flows were concerned. According to them, FPI inflows seem responsive to equity market depth (as proxied by the number of listed firms), thus implying that FPI in the form of equity and bond purchases will be attracted more to countries which already have developed financial markets (Montiel & Reinhart, 1999). Therefore, it will be interesting to examine the results yielded from studying selected financial markets in Africa and their role in harnessing foreign capital inflows.

The literature surveyed provided evidence of a strong case for financial market development. North (1981) argued that the pooling of funds, liquidity and risk-sharing associated with financial market development was essential as it significantly lowered the costs associated with investing in innovation for firms. Hence, it can be summarised that financial markets are a means of accumulating capital, which is then

allocated to those investment projects with the highest rate of return, thereby fostering entrepreneurial development and the adoption of new technology. It is assumed that once financial markets are in place and there is some level of development, domestic savings can then be complemented by foreign investment inflows.

However, countries in Africa are characterised by a limited number of financial instruments which makes it difficult to hedge against financial risk in Africa (UNECA, 2008). The strengthening of African financial markets through integration with global financial markets could lead to the promotion and strengthening of trade and investments. Beck (2002) emphasised that the link between financial development and international trade has policy implications and should be pursued as it could present the country with opportunities to specialise and enjoy economies of scale. Law and Habibullah (2009) affirmed that well-functioning financial markets and financial institutions should be a policy priority for governments. Developed countries with excess liquidity were motivated to invest in developing countries with relatively higher rates and returns (, World Investment Report, WIR, 2011).

Chami *et al.* (2009) concluded that if borrowers and lenders were willing to contract and liquidity providers found market conditions conducive to trade, then financial markets would develop. Regulatory bodies can play their part by removing obstacles that would discourage the other agents from playing their roles. A developed financial market would be one characterised by tradable financial assets, freely available investment information, adequate financial intermediaries, protection of investor rights (good institutional quality), low transaction costs, highest potential returns and macroeconomic stability.

Singh and Weisse (1998) drew attention to the pull factors which revolve around economic, legal, regulatory and political environments in developing countries. They argued that stock market development and FPI flows were unlikely to help developing nations achieve long term economic growth. This was because there were other factors besides the depth of financial markets which attracted investors to developing countries. Some papers in the literature develop models aimed at explaining the differences between volatility of direct investments and portfolio investments. One such model was by Albuquerque (2003) where he relied more on expropriation risks

and the inalienability of direct investments. Other authors in this field focused on using the asymmetric information hypothesis to address different issues related to FDI.

Financial market development cannot be attributed only to the interest rate regime, as there are other factors such as the role played by institutions (Arestis & Demetriades, 1997; Demirguc-Kent & Detragiache, 1998; Acemoglu, Johnson, & Robinson, 2002; Chinn & Ito, 2002; Demetriades & Andrianova, 2004) wherein it has been empirically tested and concluded that financial markets require a strong legal and regulatory environment in which contracts are enforceable. In addition to this, a country which is open to trade and capital inflows is enticed to further develop and strengthen its domestic financial system. This is exemplified in the work undertaken by Svaleryd and Vlachos (2002) who found that trade openness can cause financial development, but found no evidence supporting the hypothesis that financial development causes trade openness. Along similar lines, Huang and Temple (2005) put forward the view that increases in market openness are followed by sustained increases in financial depth. Levine (2001) observed that liberalising restrictions in international capital flows enhanced stock market liquidity, and allowing foreign bank presence improved efficiency of the domestic banking system. Similarly, Chinn and Ito (2002) found a significantly strong relationship between capital controls and financial development.

Errunza (2001) examined the FPI contribution towards development of local markets. He criticised earlier empirical studies that followed theoretical work and focused on the banking sector only. In his paper, Errunza (2001) advocated that there are three main effects of FPI: market development, resource allocation and globalisation and reached the conclusion that since capital flight responds to differential real interest rates, it is accepted that external financial liberalisation should not precede domestic reforms. By this, he meant that in order to attract capital external to the country, it is important to develop the local financial markets adequately to appease local investors, almost as a yardstick measure on how attractive foreign investors may then find it appealing. This argument alone is sufficient evidence that domestic savings are a catalyst to grow or further develop local financial markets which will in turn enhance the attractiveness of local markets to foreign investors.

Asiedu (2002) states that FPI is unavailable to most African countries as their own domestic financial markets are not sufficiently developed. In many developing

countries, formal financial markets are shallow implying that relatively few people have access to these markets, and the range of available financial instruments is limited. The depth of financial markets is a measure of their strength: deep financial markets are inherently less fragile than shallow financial markets, hence could be more attractive to FPI investors. In the case of financial market development, Alfaro *et al.* (2004), in examining the role of financial market development (FMD), note that countries with more sophisticated financial markets are more likely to gain from FDI inflows. That is because as the level of inbound FDI increases, local financial markets develop even further, giving rise to FPI opportunities, and hence they gain sophistication of their local markets and also an inflow of additional foreign capital in the form of FPI. Alfaro *et al.* (2004) draw attention to the fact that despite the seemingly obvious role of financial markets, the literature ignores its importance.

Levine (2001) provides substantial evidence for the hypothesis that the participation of FPI inflows increases the sophistication levels in domestic financial markets. There is also evidence that the share of FPI inflows in total capital flows increases with financial market development (Lusinyan, 2002). But, it is not clear if spill-over gains from FPI inflows are in turn dependent on the sophistication levels of the domestic financial markets. This basically suggests that the direction of causality between FPI and financial market development is not clear or it is ambiguous. For example, the availability of shares would attract FPI, but can FPI give rise to the broadening of securities available for investment? However, as with FDI outflows, the extent of FPI outflows reflect the relative unattractiveness of the source economy as an investment destination. The implication of these assertions is that they imply that as local financial markets become more developed, the likelihood of attracting FPI increases.

Using the McKinnon-Shaw hypothesis and the Calderon-Rosell model as a baseline for their own model, Andrianaivo and Yartey (2010) found that liberalisation of a country's capital account promotes financial market development only in countries with high-income levels, well-developed institutions, or both. Although financial market development includes development of the banking sector, stock markets and other financial intermediaries, their study was limited to banks. Their results concluded that banks and stock markets were complements, which was a different conclusion from that reached by Yartey (2008) who found that only in the earlier stages of development

do banks complement the stock market but later become competitors in financial markets.

De Santis and Ehling (2007) stated that the most important factor determining FDI and FPI transactions is the stock market. The stock market helps explain FDI because it produces signals that are relevant for firm investors. Foreign stock markets and home stock markets determine FPI because they measure the investment opportunity set and wealth effects. Interestingly, Portes and Rey (2005) in their research found that stock market capitalisation is a key driver of equity flows. It can be affirmed that developments in the stock market play a key role in initiating foreign portfolio investment, hence the justification to use the bulk of the data based on stock markets, supported by the banking system. Therefore, one questions the contribution that the stock market makes regarding the adequacy of financial market development, vis-à-vis FPI inflows? While it is acknowledged that the financial markets go beyond just the stock market and banking sector, the contribution of bond and derivatives markets is however beyond the scope of this study due to paucity of data.

Azman-Saini *et al.* (2010) pointed out that the role of financial markets in the FDI-growth context was hardly investigated. They noted that Alfaro *et al.* (2004) were an exception and used a linear interaction model to conclude that local financial market development is an important pre-condition for a positive impact of FDI on growth. While Azman-Saini *et al.* (2010) found that the positive effect of FDI on growth only “kicks in” after financial market development exceeds a certain threshold level, their paper focused only on the banking sector. Thus, they recommended that policies targeting FDI should go hand-in-hand with, not precede, those aimed at promoting financial market development. Gries, Kraft and Meierriecks (2009) concluded that obstacles to growth in SSA such as poor institutions are also obstacles to financial market development. Institutions and political stability are however outside the scope of this study but are recognised and acknowledged.

The finance nexus has been studied in relation to finance-law and finance-growth. In the finance-growth nexus, authors have queried whether the extent to which the financial system of a country is bank-based or market-based (stock markets) has any implications on the long-term economic growth prospects of a country (Law & Habibullah, 2009). While Levine (1997) found that indeed banks and stock markets

are complementary in the provision of financial services, questions still arise as to why if financial markets contribute positively to economic growth, many countries are still financially under-developed.

Nyasha and Odhiambo (2015) engaged scholars on the debate between bank-based and market-based financial development. Levine (2002) differentiated between the two types of financial systems. According to him, a bank-based financial system is one that is largely driven by banks and other similar financial intermediaries, while a market-based financial system integrates both the stock market and banks in ensuring savings mobilisation and allocation, as well as appropriate risk management.

To date, there is no consensus as to whether banks and stock markets are complements or substitutes for one another, particularly in the context of economic growth stimulation. Nyasha and Odhiambo (2015) conducted an empirical study involving the United States of America (USA), Brazil and Kenya over the period 1980 to 2012. They found that in USA and Brazil, bank-based and market-based financial systems complement each other, while in Kenya the two financial systems were found to be substitutes. Scholars attribute this to the varying levels of financial market development characteristic in each country. Their empirical results supported earlier findings by Yonezawa and Azeez (2010), Abor, Adjasi, Bokpin and Osei (2010), Masoud and Hardaker (2012) and Odhiambo (2014), who also concluded that banks and stock markets are complementary in nature, particularly in developed and emerging markets. It must however be noted that the results are also significantly dependent on the proxies applied in the individual studies.

Hence, based not only on the theoretical underpinnings, but also the empirical evidence presented, financial market development in our study will encompass both bank-based and market-based variables in order to capture and reflect the international standard of measuring financial market development.

2.5.4 Measuring financial market development

There is a range of indices or indicators which can be applied to financial markets to gauge the functioning of the financial system as a whole. Broadly, there are three dimensions that need to be accounted for: institutional dimension, market dimension

capturing size and market dimension capturing performance (Dorrucci *et al.*, 2009). Depending on the specific financial market, there are indicators available to measure and assess the development of financial markets. While it is acknowledged that there are many variables to measure financial market development, we chose to work specifically with common indicators of financial market development including the size and depth of the local financial markets as used in earlier empirical studies, commonly decomposed into stock market and banking sector variables.

According to Eryiğit, Eryiğit and Dülgeroğlu (2015), due to data availability, and because there are less restrictions on indicators pertaining to banking activities, many studies address merely those indicators and rule out the equity market. However, according to Beck, Demirgüç-Kunt and Levine (2001), both markets assume similar functions in the economic growth process and closely interact with each other. Beck *et al.* (2001) affirm that studying both markets together will ensure more accurate and clear interpretations in the assessment of the financial system. According to Khan and Semlali (2000), industrialised countries have enjoyed significant non-bank financial development, while developing economies have experienced rapid development within their banking sectors. They further acknowledged the growing importance of the role of capital markets in developing countries, emphasising that these too cannot be ignored when examining financial market development. Levine (1997) earlier also argued that banks and capital markets are complementary to each other in terms of financial services provision to the economy, and should hence be examined together as far as possible.

It was on this basis that this study encompassed variables reflecting both stock market development, as well as banking sector development. This was necessitated by the need for a holistic overview of financial market development as some variables accurately reflect the state of the banking sector but not the stock markets, and vice-versa. As such, premised on this banking sector and stock market complementarity notion, and supported by earlier empirical studies by Demirguc-Kunt and Levine (1996), Khan and Semlali (2000), Love and Zicchino (2006), Otchere *et al.* (2015) and Soumaré and Tchana (2015), the financial market development indicators selected for use in this study encompassed variables representing both the banking sector and equity markets. They were:

- Stock market capitalisation;
- Stock market value traded;
- Credit to the private sector by banks and other financial intermediaries;
- Liquid liabilities of the financial system scaled by GDP; and
- The ratio of commercial bank assets to the sum of commercial bank and central bank assets.

These variables will be further discussed and justified in the methodology chapter of this study. Soumaré and Tchana (2015) however cautioned that when analysing the relationship between FDI and FMD, results will depend on whether the selected FMD variables applied in the study measure development of the stock market or development of the banking sector. Hence, they advised that when assessing bi-directional causality, simultaneous equations should be used to account for potential problems of endogeneity. This challenge was overcome by not only examining individual proxies of the banking sector and stock markets, but also constructing a composite financial development index that reflects both banking sector and stock market development. This will also be further addressed in the methodology chapter of this study.

2.6 Chapter summary and conclusion

In conclusion, having examined the theories behind each of the key variables, as well as supported each with evidence from earlier empirical studies, we acknowledge that for a host country to derive positive benefits from inward FDI and FPI inflows, financial market development (FMD) plays a pivotal role. Financial market development avails, and facilitates access to external financial resources, particularly for domestic firms. Furthermore, financial market development ensures the allocative efficiency of these external financial resources by assessing the riskiness of investment projects, and expected returns thereof. These roles are suitably fulfilled by both the credit market (i.e. the banking sector), and the stock (equity) market.

The surveyed literature concurred that a well-functioning and developed domestic financial market is a pre-requisite for attracting international capital flows, both for developed and developing countries. This supports the proposition that financial

market development is crucial in harnessing foreign capital inflows, specifically FPI; thereby also helping to explain the direction of causality in this case. This is evidenced in Errunza's (2001) study wherein he affirms that a well-functioning local market is a precondition for attracting FPI, and also that FPI has a major impact on economic development and growth because it contributes to the further development of domestic capital markets. This consequently implies bi-directional causality between FPI and FMD. This study will whether similar results will be reached in the case of the selected African countries being examined.

On the other hand, Soumaré and Tchana (2015) postulate that the causal relationship between FDI and FMD can be theoretically explained three-way. There is the notion by Desai, Foely and Hines (2006) that FDI inflows increase available funds in the economy, thereby giving rise to financial intermediation through financial markets or the banking sector. Also, the global practice of stock market listings forces most FDI-firms to list their shares domestically as well to facilitate future financing needs (Henry, 2000). The political environment of a country can also influence the proposal and implementation of investor and market-friendly policies, which serve to strengthen further financial market development, and boost investor confidence (Kholdy & Sohrabian, 2008; Rajan & Zingales, 2003). Finally, an efficient and developed financial market attracts potential foreign investors who perceive the level of FMD as an indicator of openness. A well-developed stock market would increase liquidity, reduce cost of capital and thus attract further foreign investment to the country.

As such, the literature gives motivation for our study to be conducted. The theoretical underpinnings and earlier empirical studies based on a different set of markets and economies gives rise to the need to examine FDI and FPI inflows, and the role of financial market development, specifically with regard to Africa. The next chapter will therefore consider the specific characteristics of FDI, FPI and FMD in Africa, with the objective of contextualising the study. It is important to shed light on the impact of financial market development on African economies' ability to harness foreign capital flows. It is also noteworthy to appreciate that the literature highlighted other absorptive capacities such as institutional factors, which need to be present in addition to domestic developed financial markets, for host economies to enjoy the full benefits of FDI and FPI. Hence, bringing together the different concepts of FDI and FPI, and

linking them to FMD, particularly in Africa, this study will contribute to the growing body of knowledge.

The next chapter examines in depth FDI, FPI and financial markets in the selected African countries, in order to contextualise the study.

Chapter Three: Conceptual Framework on FDI, FPI and Financial Market Development in Africa

3.1 Introduction

The previous chapter provided the general literature behind this study. It provided both the theory and empirical evidence of FDI, FPI and financial market development from a broad global perspective. This chapter will discuss the literature specific to this study by examining the link between FDI, FPI and financial market development, in the context of the selected African economies. Africa was selected as a focus area because many of its financial markets remain under-developed, and as a continent, continues to receive the least amount of foreign capital inflows.

Agbloyor, Abor, Adjasi and Yawson (2012) attested to the importance of financial market development in spurring economic growth in Africa. Due to the fact that the banking sector in Africa is more developed than the equity market, a significant amount of FDI activity occurs outside the stock markets (Agbloyor *et al.*, 2012). Exploring the causality links between financial markets and FDI in Africa in a separate study later, Agbloyor *et al.* (2013) found that while countries with better-developed stock markets are more likely to attract FDI inflows, FDI flows can also lead to the development of the domestic stock market. They also found that a more advanced banking system can lead to more inward FDI flows, and higher FDI flows can also lead to the development of the domestic banking system. Their results therefore imply significant complementarities and feedback between FDI and financial markets in Africa.

The investment environment in Africa portrays both pull and push factors for potential investors. On the one hand, domestic investment is a necessary catalyst to enhance local economic growth, increase employment and reduce poverty. Foreign investment is equally important as it plays a significant role in developing economies. In line with the Millenium Development Goals (MDGs), the benefits of foreign direct investment (FDI) inflows cannot be ignored. According to Anyanwu and Erhijakpor (2004), African economies need to attract higher FDI inflows due to declining levels of official development assistance (ODA), FPI volatility and the generally low domestic savings

rates. They further emphasised the pivotal role played by FDI in Africa by reaffirming that:

1. FDI inflows supplement domestic savings.
2. FDI contributes towards employment creation and growth.
3. FDI assists Africa to integrate into the global economy.
4. FDI ensures an infusion and diffusion of technology through research and development.
5. FDI forces efficiency within the economy by introducing stiff competition to domestic firms, thereby stimulating efficient allocation and utilisation of resources.
6. FDI aids the improvement of skills of domestic labour through training of workers.

On the other hand, investment to Africa is deterred by the presence of certain factors which are deemed uncondusive to foreign investors. According to Anyanwu (2006), African financial (money and capital) markets are largely inefficient, under-developed and inaccessible to most savers and debt-seekers, thereby hindering domestic savings mobilisation and the attraction of foreign investment flows. Also, macroeconomic and political instability, poor quality institutions, poor infrastructure, and the restrictions on the foreign ownership and participation, repatriation of profits and foreign currency have worsened the investment environment in Africa.

As such, there is need to improve the image of the continent in order to attract significant international capital flows to Africa. Also, governments need to formulate investment-driven reforms and policies which can aid the harnessing and retention of both domestic and international capital inflows, which can serve as catalysts for enhanced economic growth – the underlying objective behind any productive utilisation of country-endowed resources to ensure that maximum gains are derived from the capital committed.

The rest of this chapter is organised as follows. Sections 3.2, 3.3 and 3.4 consider the concepts of foreign direct investments, foreign portfolio investments and financial market development in Africa, respectively. Each of the sections will give a broad and general overview of the concept under examination, discuss the major current trends

related to each, as well as related earlier studies. Section 3.5 will then summarise the afore-mentioned discussions.

3.2 Foreign direct investment in Africa

Between 1986 and 1990, as well as 1999 and 2000, Africa's FDI inflows dropped from 1.8% to 0.8% of the global totals. More recently, FDI inflows globally dropped by 8%, to approximately US\$1.26 trillion in 2014, attributable to economic fragility, policy uncertainty and political risk (Makoni, 2015). According to the UNCTAD (2014), FDI inflows to Africa increased by 4% to US\$57 billion, on the strength of international and regional market-seeking and infrastructure investments, which was also in line with the previously-discussed literature on the motives of FDI. The largest economic bloc contributors to the FDI rise were the Eastern and Southern African blocs. Southern African inflows doubled from US\$6.7 billion in 2012 to \$13.2 billion in 2013, due to record-high flows to South Africa and Mozambique. Infrastructural development was the main attraction of FDI to both countries, with investments in the gas sector in Mozambique also making a significant contribution.

FDI in the East African Community (EAC) increased by 15% to US\$6.2 billion as a result of growing inflows to Ethiopia and Kenya (Makoni, 2015). Kenya, previously renowned for its expansive tourism sector, has evolved into a preferred business hub, not only for oil and gas exploration but also for manufacturing and transport. The country has also become a global leader in mobile phone banking payments, and now attracts technology firms interested in investing in innovation.

On the other hand, FDI flows to North Africa decreased by 7% to US\$15.5 billion. Although Egypt's FDI dropped by 19% to US\$5.6 billion, foreign investors did not completely ignore the economy. Egypt has a large population which translates into a big market size, and a reliable pool of low-cost labour – both of which are significant determinants of FDI. Central and West Africa saw inflows decline to \$8 billion and \$14 billion, respectively, due to political and security uncertainties in most countries in the region, which coincidentally include oil-rich nations such as Nigeria.

FDI to Africa has flowed from various countries and has been directed at different sectors of the economy. An assessment of FDI inflows to Africa revealed that most source countries are in the European Union (United Kingdom, Netherlands, Italy and France), as well as the United States. The economic sectoral beneficiaries are mainly financial services, petroleum and mining, as well as manufacturing (UNCTAD, 2014). Table 3.1 gives a snapshot of FDI to our selected African economies from 2007 to 2014. The entire study's period of 1980 to 2014 is given as an average of the period's inflows. Earlier work by Makoni (2015) revealed that in general, there was an upward trend in FDI inflows to most of the surveyed countries between 1975 and 2014. Small economies such as Egypt, Tunisia and Mauritius have emerged and taken over traditional recipients of foreign direct investment such as oil-producing Nigeria. Nigeria lost substantial volumes of FDI primarily as a result of fluctuating global oil prices, as well as its own political instability, which shook investor confidence.

Table 3.1: FDI inflows to selected African economies (% FDI to GDP)

	2007	2008	2009	2010	2011	2012	2013	2014	1980-2014 AVG
BWA	4.52	4.76	1.25	1.06	6.97	0.99	1.26	2.31	3.19
CIV	2.18	1.93	1.63	1.44	1.19	1.19	1.19	1.33	1.27
EGY	8.87	5.83	3.55	2.92	-0.20	1.06	1.54	1.67	2.40
KEN	2.28	0.27	0.31	0.45	0.33	0.32	0.68	1.55	0.54
MAUR	4.37	3.92	2.91	4.42	3.85	5.15	2.17	220.00	7.71
MORO	3.76	2.77	2.17	1.37	2.54	2.96	3.23	2.45	1.28
NGA	3.63	3.94	5.05	1.64	2.15	1.54	1.09	2.29	3.00
RSA	2.20	3.45	2.58	0.98	0.99	1.16	2.25	1.64	0.93
TUN	3.89	5.80	3.51	3.00	0.94	3.44	2.25	2.63	2.53

Source: World Development Indicators (2015)

As indicated in Table 3.1, Mauritius has been receiving significant FDI inflows, equivalent to as much as 220% of its GDP in 2014. In 2007, the top 3 FDI-recipient countries in terms of FDI to GDP were Egypt (8.87%), Botswana (4.52%) and Mauritius (4.37%). Shortly after the global economic meltdown, the top 3 FDI-recipient countries were Botswana (6.97%), Mauritius (3.85%) and Morocco (2.54%), while in 2014, Mauritius remained leading the pack (220%), followed by Tunisia (2.63%) and

Morocco (2.45%), respectively. Of all the countries under review, Mauritius harnessed the highest average of 7.71% of FDI to GDP over the period 1980 to 2014, followed by Botswana at 3.19% and Nigeria at 3%. This was significant compared to Kenya's 0.54%. The leading FDI-recipients had different country profiles. Mauritius, is primarily a sugar exporter, renowned also for its tourism and textile sectors, and more recently, its booming financial and ICT sectors; while Botswana and Nigeria, on the other hand, are resource-dependent economies.

Chinese FDI in Africa

Africa's key trading partner is China. This is evident when we examine the trade relationship between China and Africa. According to the Trade Law Centre (Tralac, 2013), China's total trade with Africa increased by 26% between 1995 and 2012, with Chinese imports from and exports to Africa accounting for increases of 29% and 23%, respectively. In the 2011/ 2012 economic year alone, total trade between China and Africa grew from US\$166 billion to US\$198 billion, representing a 19% increase in 2012, from 2011 levels.

During the same period, imports from Africa to China increased by 21%, while exports to Africa only went up by 17% (Makoni, 2014). Tralac (2013) further states that China's key imports from Africa in 2012 were mineral products (55%), other unclassified goods (26%), base metals (4%), precious stones and metals (3%) and textiles and clothing (1%). These five products alone accounted for 89% of China's total imports from Africa for the entire year. On the other end of the spectrum, China's main export products to Africa were predominantly value-added manufacturing goods such as transport equipment (3%), textiles and clothing (3%), machinery (3%), footwear (2%) and plastic products (2%), accounting for a mere 13% of total Chinese exports to Africa over the 2011 – 2012 period. (Makoni, 2014). China imported mainly from South Africa, Angola, Libya and the DRC, while its Chinese exports were primarily destined for markets in South Africa, Nigeria, Egypt, Algeria and Ghana. Pigato and Wang (2015) strongly believe that Sub-Saharan African countries are not exploiting their comparative advantages in agriculture to expand its export presence in the Chinese market, with agricultural exports to China being only approximately 3% of Africa's total agricultural exports (Renard, 2011).

In their study on Chinese FDI in Africa, Claassen, Loots and Bezuidenhout (2012) examined the general trend of FDI inflows to the continent over a five year period from 2003 to 2008. They found that the greatest volume of Chinese FDI inflows were directed to South Africa, Nigeria, Zambia, Algeria and Sudan, respectively; while collectively accounting for 86.5% of China's FDI to Africa during that period. South Africa alone was the biggest beneficiary, harnessing 64.3% of Chinese FDI inflows between 2003 and 2008. This finding was also confirmed by Loots and Kabundi (2012) also established that FDI inflows to Africa are unevenly spread, and concentrated either in the largest economies and/ or in oil-exporting countries. As a result, Loots and Kabundi (2012) cautioned that natural-resource driven FDI, particularly oil, has limited linkages to domestic firms, and minimal impact on downstream activities in host countries. As such, they recommended that African countries need to implement programmes to channel petroleum and mining revenues for investment in physical and human capital that is supportive of the broader economic growth and development objectives.

In assessing relationships and causality between inward Chinese FDI to African economies, Claassen *et al.* (2012) found the following:

a) Chinese FDI and African GDP

African economies with higher GDPs will most likely attract larger volumes of Chinese FDI, and Chinese FDI in turn enhances economic growth in African economies, thereby implying bi-directional causality between the two variables.

b) Chinese FDI and African corruption

Causality test results show that the null hypothesis that corruption does not Granger-cause Chinese FDI was rejected at the 5% level of significance, implying that corruption does entice FDI as it is easier for Chinese firms to bribe their way into the local markets. On the other hand, the null hypothesis that corrupt Chinese FDI does not cause corruption could not be rejected at any level of significance as corruption tendencies of the Chinese are not in any way directly hindering African attempts to overcome corruption.

c) Chinese FDI and African infrastructure

Granger causality tests show that the presence of Chinese firms in Africa actually enhances domestic infrastructure. Claassen *et al.* (2012) emphasised

that it is not the availability of quality infrastructure in African that attracts Chinese FDI, but rather the absence of such infrastructure. Hence, an FDI spillover effect of Chinese FDI is that it yields a positive impact on African infrastructural development.

d) *Chinese FDI and African human capital*

The relationship between FDI and human capital development was found to be bi-directional, with human capital attracting FDI, and FDI equally leading to the further development of human capital in Africa.

If Chinese FDI is indeed not to exploit but rather to benefit African countries, then the local population should be able to enjoy the positive spillovers resulting thereof, including access to technology, management skills and human capital, amongst others.

3.3 Foreign portfolio investment in Africa

Foreign portfolio investment (FPI) flows to Africa have been negligibly low. Reports indicate that this is due to the continent's generally under-developed financial markets.

Table 3.2: FPI inflows to selected African economies (% FPI to GDP)

	2007	2008	2009	2010	2011	2012	2013	2014	1980-2014 AVG
BWA	0.09	-0.34	0.17	0.09	-0.11	-0.06	0.01	0.02	0.09
CIV	0.01	0.01	0.01	0.01	0.01	0.11	0.00	0.03	0.07
EGY	-2.45	-0.41	0.21	0.79	-0.30	-0.37	-0.16	0.17	0.03
KEN	0.00	0.01	0.01	0.06	0.05	0.05	0.47	1.57	0.06
MAUR	0.64	0.35	2.33	80.48	52.57	4.56	5.92	6.50	5.90
MORO	-0.08	0.17	0.00	0.15	0.17	-0.11	0.04	0.05	0.17
NGA	-0.57	0.23	1.27	0.70	2.43	2.17	1.36	1.59	0.93
RSA	2.90	-1.64	3.16	1.55	-0.90	-0.17	0.28	0.73	1.02
TUN	0.08	-0.09	-0.20	-0.06	-0.10	-0.03	0.17	-0.04	0.19

Source: World Development Indicators (2015)

On the back of the availability of adequate investment securities on the capital markets in Botswana, Cote d'Ivoire, Egypt, Kenya, Mauritius, Morocco, Nigeria, South Africa and Tunisia, the highest recipients of FPI inflows (scaled by GDP) on average over

the 1980 to 2014 period under review were Mauritius, South Africa, Nigeria, Tunisia and Morocco. It was interesting to note that two of these countries were in the MENA region. Immediately after the global financial crisis, Mauritius experienced an increase in FPI inflows recording levels as high as 80% in 2010 and 52% in 2011, respectively, at a time when most other countries in the survey were experiencing disinvestments of FPI. This reaffirmed the country as a destination of choice for foreign investors who sought to diversify their portfolios to areas considered relatively less affected by the financial crisis.

3.4 Financial market development in Africa

The existence of financial markets is the result of an economy characterised by surplus and deficit units. Capital markets are no different. In Africa, private capital demand is the result of a desire to use technology transfers and abundant low-cost labour. Sovereign capital demand is generated by the need to finance budget deficits and boost infrastructural development. Both these scenarios provide opportunities for foreign investors to diversify their portfolios by venturing into other financial markets, besides their own. In considering where to place their surplus funds, foreign investors consider such matters as the higher costs of transacting in foreign securities, exchange rate risk, political risk and institutional factors and the failure of purchasing power parity.

Researchers have in recent years provided evidence on the growing and important role of financial market development with regard to economic growth. While the focus of this study is not on economic growth per se, it is important to understand financial market development holistically. Some arguments that have been put forth are that financial market development enhances resource allocation efficiency. The financial markets are responsible for reducing liquidity risk, while facilitating risk management on behalf of savers. The same system also offers alternative avenues of investment (portfolio diversification), as well as acting as an information hub for would-be investors (Bencivenga & Smith, 1991; Demirguc-Kunt & Maksimovic, 1996; King & Levine, 1993). As such, according to Allen and Ndikumana (2000), countries which have unsophisticated financial markets offer investors limited investment choices, often resulting in harnessed savings being allocated to unproductive projects.

There are 54 countries in Africa (African Union, 2015). For ease of reference, these countries are often classified geographically as opposed to economically, hence, there is North Africa, West Africa, East and Central Africa and Southern Africa. Each of these economic blocs differ quite significantly, i.e. the macroeconomic and financial characteristics are not homogenous. However, this study has attempted to draw a sample representative of the entire continent's population by selecting to examine those African economies for which adequate data is available to conduct a meaningful analysis. African financial markets are generally underdeveloped, so it was equally prudent to identify those countries which have an active stock market, as this is a key variable in our study. As such, our countries of focus were Botswana, Cote d'Ivoire, Egypt, Kenya, Mauritius, Morocco, Nigeria, South Africa and Tunisia.

3.5 Overview of African financial markets

The financial landscape in Africa is diverse. However, two main categories of financial markets can be identified, namely, the public equity (stock) market and the private debt (banking sector) market. There are other financial markets present such as the bond and derivatives markets but these fell outside the scope of this study because not all countries under examination have established these trading platforms as yet. In line with earlier studies by Levine and Zervos (1998); Allen and Ndikumana (2000); Allen, Otchere and Senbet (2011); and Ojah and Kodongo (2014), this study will focus only on the stock and banking credit markets, based on the fact that these are the dominant channels through which investors and savers ensure the productive use of capital flows in Africa.

3.6 Stock market development in Africa

Africa has 29 national stock exchanges, including two regional bourses, one of which represents the Francophone countries (BRVM is for countries in West Africa and is based in Cote d'Ivoire; BVMAC is based in Gabon) (African Business Review, 2013). Stock markets play a very important role in an economy. Roles that have been continually reinforced are the commonly-discussed savings mobilisation, resource allocation, liquidity, risk sharing and portfolio diversification. Ojah and Kodongo (2014) gave credence to the economic relevance of stock markets by analysing them on the basis of size (proxied by stock market capitalisation to GDP), efficiency (liquidity which

is measured by the value of traded shares scaled by stock market capitalisation), supply of equity capital (based on number of listed counters) and infrastructural adequacy (dependent on the trading or settlement system). Table 3.3 below illustrates the main stock market development indicators for selected African stock exchanges as commonly applied in research.

Table 3.3: Stock market development indicators

Country	Stock market capitalisation % of GDP		Total value traded % of GDP		Turnover ratio		Domestic listed firms		Infrastructure* (trading system)
	2005	2014	2005	2014	2005	2014	2005	2014	
East Africa									
Kenya	34.1	29.4	2.7	3.3	9.8	8.1	47	65	Electronic
North Africa									
Egypt	88.8	22.1	28.3	8.8	43	37.8	744	246	Electronic
Morocco	45.7	54.9	7	2.8	15.9	6.2	56	74	Electronic
Tunisia	8.9	21.1	1.4	1.8	16.5	7.1	50	77	Electronic
Southern Africa									
Botswana	24.5	31.6	0.5	0.8	1.8	2.6	18	24	Manual
Mauritius	41.7	62	2.4	3.7	6	4	42	66	Electronic
South Africa	228.9	160.1	81.2	70.2	39.3	54.9	388	322	Electronic
West Africa									
Cote d'Ivoire	13.6	28.9	0.2	1.2	1.4	2.6	39	38	Electronic
Nigeria	17.2	12.2	1.7	0.9	11.5	8.8	214	188	Electronic
Sub-Saharan Africa									
	128.2	67	43.2	29.2	37.3	47.2	911	923	n/a
World									
	93.7	74.2	102.8	69.4	116.5	99.8	50,936	47,520	Electronic

Sources: World Development Indicators (2015); *Trading system data adopted from Allen, Otchere and Senbet (2011)

The **Botswana Stock Exchange (BSE)** is relatively young, having been established in 1989 as the Botswana Share Market, with only five listed companies, prior to converting to its current name in 1997. It is governed by the Botswana Stock Exchange Act of 1994. With the vision to be the leading stock exchange in Africa, the BSE aims to achieve this by:

- Growing the market in terms of number of listings, market capitalisation and liquidity, and in addition;
- Providing excellent returns for our participants;
- Attracting the most foreign portfolio investment (FPI); and
- Improving internal operations (including being self-sustainable).

The BSE has two main boards: the main board and the venture capital board; the latter having been set up in 2001, specifically for firms seeking start-up capital. Bond activity commenced in 2003, and more recently exchange-traded funds (ETFs) have also been introduced. The number of listed counters on the BSE has grown from the five at inception, through to 44 in 2004, and 56 in 2006. The listed firms are from the various economic sectors of wholesaling and retailing, financial services and insurance, banking, property and property trust, mining, security services, transport and tourism, energy, and health care and emergency services. As at July 2016, there were 24 listed domestic firms (of which 22 were on the main board and two were listed on the venture capital board), 14 foreign listings (of which four were on the main board, six on the venture capital board and four were exchange-traded funds [ETFs]) and 33 corporate and parastatal bonds as well as six government bonds.

Investors on the BSE are subjected to a 7.5% withholding tax on dividends, while interest earned attracts a 10% tax rate. Individual foreign investors are also restricted to a 10% share ownership cap. However, the regulations of the BSE do permit foreign investors to hold up to a collective maximum of 55% of the share capital of companies listed on the BSE.

Cote d'Ivoire (formerly Ivory Coast) had the Abidjan Stock Exchange (ASE), also known as the Bourse des Valeurs d'Abidjan. Although established in 1974, it only commenced trading in 1976. It was the sole stock exchange in the Francophone West African countries but was closed at the end of December 1997. In 1998, the **Bourse Régionale des Valeurs Mobilières (BRVM)** was established. The BRVM, headquartered in Cote d'Ivoire, is a regional stock exchange serving the interests of the Francophone countries of Benin, Burkina Faso, Cote d'Ivoire, Guinea Bissau Mali, Niger, Senegal, and Togo, which also make up the West African Economic and Monetary Union (WAEMU). Listed companies include those from the fast-moving consumer goods (FMCG), oil and gas, consumer services, telecommunications, financial services, utilities and industrial sectors. A 10% withholding tax is imposed on all dividends from investments made on the BRVM.

The **Egyptian Exchange (EGX)** is one of the oldest stock markets to be established in the Middle East. Its origins can be traced back to 1883 when the Alexandria Stock Exchange was established, followed by the Cairo Stock Exchange in 1903. The Alexandria Stock Exchange was renowned for its forward cotton contracts, to the extent that up until the 1950s, most of the trading was done with the Liverpool Cotton Exchange; proof of Egypt's strong ties with the British Empire; and also Egypt's own dependency on the cotton crop. When Egypt's economy was booming, the number of listed companies on the Cairo Bourse alone reached 228, with a combined market capitalisation of ninety-one million Egyptian pounds. At one point when taken into consideration together, the Cairo and Alexandria Bourses ranked among the world's top five stock exchanges. As of July 2016, there were 222 listed companies on the EGX, with a turnover of 18.88%, the lowest over the past years. The first ETF on the Egyptian market was traded in 2016. Egypt imposes no restrictions on foreign ownership or investment, and there are also no taxes levied on capital gains, dividends nor repatriated funds, which makes foreign entry and exit simple.

The **Nairobi Securities Exchange (NSE)** in Kenya, previously the Nairobi Stock Exchange, was established in 1954. It was initially a voluntary association of stockbrokers from the resident European community, registered under the Societies Act until after independence in 1963, because black Africans and Asians were not permitted to trade in securities. At independence, stock market activity fell, due to uncertainty about the future of the new and independent Kenya. The NSE is regulated by the Capital Markets Authority, is publicly traded and in 2014 became the second self-listed exchange in Africa, the Johannesburg Stock Exchange (JSE) of South Africa. There are 65 listed companies spanning manufacturing, real estate, insurance, banking and investment services, ICT, agriculture, construction, as well as energy and petroleum sectors of the economy. The tax rates imposed on investors are dividend withholding taxes of 5% for domestic investors, and 10% for foreign investors; withholding tax on interest income of 15%; while capital gains taxes were suspended from 1985. The NSE further welcomes foreign investment by capping share ownership by foreign investors at 75% in any single listed company.

The **Stock Exchange of Mauritius Ltd (SEM)** was incorporated in Mauritius in 1989 under the Stock Exchange Act of 1988, as a private limited company responsible for

the operation and promotion of an efficient and regulated securities market in Mauritius. SEM has grown in terms of technological infrastructure and market size, as evidenced by its progression from the open-cry trading system in 1989 to being the first exchange in Africa to migrate to a fully automated and electronic stock market infrastructure in 2001. The technology it uses has also been implemented by the London Stock Exchange and the Johannesburg Stock Exchange in recent years too, thereby reaffirming SEM's foresight in adopting a technological platform that is well set to become the most used platform in the stock exchange business even at an international level. In October 2008, SEM became a public company.

SEM started its operations in 1989 with only five listed companies on the Official Market, with a market capitalisation of nearly USD92 million. The size of the market has grown from a market capitalisation to GDP ratio of less than 4% in 1989, to its current stock market capitalisation ratio exceeding 75%. SEM operates two markets: the Official Market, as well as the Development and Enterprise Market (DEM). The latter (DEM) was set up in 2006, specifically for Small and Medium-sized Enterprises (SMEs) and start-up companies which possess a sound business plan and demonstrate a good growth potential. It targets companies wishing to avail themselves of the advantages and facilities provided by an organised and regulated market to raise capital to fund their future growth, improve liquidity in their shares, obtain an objective market valuation of their shares and enhance their overall corporate image.

Currently, there are 51 companies listed on the Official Market, with a market capitalisation of nearly US\$ 5.5 billion (as at 30 June 2016), while the DEM has listed companies, with a market capitalisation of nearly US\$ 1.2 billion (as at 30 June 2016). Local investors are active participants on the SEM, accounting for about 60% of the daily trading activities, while foreign investors account for the remaining 40%. Institutional investors such as mutual funds, pension funds and insurance companies contribute 75% of the local trading volumes.

In terms of foreign participation, SEM has rules for remote membership in place, with the objective of encouraging membership from foreign brokers and foreign participants. The stock market was opened to foreign investors following the lifting of exchange controls in 1994. Foreign investors do not need approval to trade shares,

except for the holding of more than 15% in a sugar company. Foreign investors benefit from numerous incentives such as revenue on sale of shares being freely repatriated and there being no withholding taxes on dividends and no taxes on capital gains. SEM is also the only African bourse that lists, trades and settles equity and debt products in currencies such as the United States Dollar (USD), Euros (EUR), British Pounds (GBP), and South African Rands (ZAR), in addition to the local Mauritian Rupee currency (MUR). This reinforces the attractiveness of SEM as a listing and capital-raising platform for African and emerging market issuers, and for harnessing inward foreign investment from the world over.

Since 2010, SEM has embarked on a diversification and internationalisation process aimed at moving up the value-chain of products listed/traded on the SEM platform, and emerging as an attractive listing, trading and capital-raising investment destination offering a diversity of products and services for global funds and business companies, mining companies, specialist-debt products, Africa-based ventures, and Government securities. Since then, SEM has successfully listed at least 50 international products, including the May 2016 listing of the CoreShares S&P500 ETF, the first S&P500 product to be listed on an African Exchange, as well as the CoreShares S&P Global Property40 Index, the first of its kind worldwide.

The **Casablanca Stock Exchange (CSE)** in Morocco was established in 1929, and has been growing since then. In 1997, it opened a central scrip depository (Maroclear), and in 1993 installed an electronic trading system. The CSE operates two main boards: the Central Market and the Black Trade Market. CSE is a high achiever in the Middle East and Northern Africa (MENA) region; and in Africa, ranks third after the Johannesburg and Nigerian Stock Exchanges, respectively. The CSE states its primary objectives as being:

- To assist the country's economic development;
- To meet market operation needs by providing investors and instrument issuers with a modern, liquid and transparent market;
- To develop the stock market through accelerated growth; and
- To be ranked amongst the leading stock markets in Africa. The CSE is already the third largest stock exchange on the continent and it strives to reduce the gap

between itself and the leading two exchanges with the aim of becoming the leading stock exchange in West Africa.

According to El Yaakoubi of Reuters (2015), the Moroccan government drafted new rules to enhance the attractiveness of the stock market to potential investors. These rule changes included allowing foreign companies to list their shares in foreign currency or in Morocco's dirham on the Casablanca stock exchange, as well as establishing a second market dedicated to small and medium-sized businesses. There are no restrictions of foreign investment or foreign ownership on the CSE (Mahonye, 2014).

The **Nigerian Stock Exchange (NSE)**, (formerly known as the Lagos Stock Exchange until 1977), was established in 1960. The NSE is a registered company limited by guarantee, licensed under the Investments and Securities Act (ISA), and is regulated by the Securities and Exchange Commission (SEC) of Nigeria. As at end June 2016, it had 180 listed companies. In order to encourage foreign investment into Nigeria, the government obliterated laws preventing the flow of foreign capital into the country, initially by allowing foreign brokers to be registered as dealers on the Nigerian Stock Exchange, and then welcoming investors of any nationality to invest in Nigeria. Nigerian companies are also allowed multiple and cross border listings on foreign markets. There is a 10% withholding tax on dividends, and also a 10% tax on interest earned.

The **Johannesburg Stock Exchange (JSE)** is based on South Africa. It is Africa's largest stock market, with over 400 listed companies on both its main board and the Alternative Exchange (AltX). The JSE came into being in 1887, making it the oldest stock market in Africa, and the nineteenth largest in the world in terms of market capitalisation. The JSE deals in equities, bonds, and a range of derivative securities such as futures and options on equities, bonds, indices, interest rates, currencies and commodities. In 2003, the alternative exchange, AltX, for small and mid-sized listings, followed by the Yield X for interest rate and currency instruments, were launched. The JSE acquired the South African Futures Exchange (SAFEX) in 2001 and the Bond Exchange of South Africa (BESA) in 2009, and is today actively involved in five financial markets: equities, bonds, as well as financial, commodity and interest rate

derivatives. In 2011, the JSE undertook the decision to allow foreign domiciled companies to be recognised as domestic listings. Although foreign companies were permitted to list on the JSE since 2004, they previously subjected to foreign exchange rules, which capped the amount of equities investors could hold. The JSE itself was listed as a company on the bourse in 2005, thus subjecting itself to the same stringent requirements as other listed entities (JSE, 2016).

The ***Bourse des Valeurs Mobilières de Tunis (BVMT)*** or Tunis Stock Exchange is a private company, exclusively and equally owned by its member brokerage firms. It began as a public institution in 1969, with a very limited financing role due to the dominance of banks and the state in the economy. This was the case until 1988 when the legal framework for financial markets was initiated. The Conseil du Marché Financier (CMF) was created in 1994 to oversee the organisation and supervision of the stock market, regulate issues of new securities, as well as to ensure protection of investors' savings placed in securities on the stock exchange and other financial products. The Tunis Stock Exchange deals in shares, bonds and funds. There are no taxes levied on dividends, although capital gains are subjected to a number of taxes, depending on whether the investor is a local or foreign individual or corporate, up to a maximum of rate of 30% for withholding taxes for foreign companies. Bond interests are levied a 20% tax.

In summary, the stock exchanges of Botswana, Cote d'Ivoire, Egypt, Kenya, Mauritius, Morocco, Nigeria, South Africa and Tunisia that were surveyed vary in terms of size, infrastructural technology, regulation and efforts to attract foreign investors to the capital markets. It remains to be seen how these differences will have an impact on the economies' abilities to harness capital flows from abroad.

3.7 The banking sector in Africa

According to McKinnon (1973), the cost of capital determines where investors place their money. In view of this assertion, banking sectors and capital markets of economies can either be substitutes or complements for one another; depending on the level of development which reflects the availability to appropriate securities, at a risk and cost reasonable and acceptable to the investor.

We identified three measures to reflect the state of the banking sectors in our countries of interest. These were domestic credit to the private sector by deposit banks as a share of GDP, liquid liabilities of the financial system scaled by GDP, and the ratio of commercial bank assets to commercial bank and central bank assets.

Domestic credit to the private sector by banks (PCRED) refers to financial resources provided to the private sector by the financial sector including deposit money banks and other depository corporations (deposit-taking corporations except central banks), such as through loans, purchases of non-equity securities, and trade credits and other accounts receivable, that establish a claim for repayment (World Bank, n.d.). It measures financial intermediary activity and the efficiency of channelling savings to investors, and is considered to be a common investment vehicle in countries where the stock market is under-developed (Ghartey, 2015). A high level of credit to the private sector indicates an abundance of domestic capital, in which case, foreign capital (FDI and FPI) would not be necessary (Anyanwu, 2012).

In light of the selected countries, the average amount of domestic credit to the private sector by banks was below 50% of GDP for the period under review of 1980 to 2014, with the exception of South Africa (108%), Tunisia (62%) and Mauritius (54%). Countries such as Botswana, Nigeria, Cote d'Ivoire and Kenya recorded domestic credit to the private sector by banks below 30% of GDP. This trend of stagnated levels of domestic credit to the private sector by banks portrays the depressed state of alternative financing options for development projects in the selected African countries.

Table 3.4: Domestic credit to the private sector by banks (PCRED)

	2000–2004 average	2005–2009 average	2010	2011	2012	2013	2014
BWA	18.50	20.79	27.19	26.84	31.03	31.63	31.88
CIV	13.91	14.40	16.59	17.13	16.70	18.30	20.33
EGY	53.90	49.84	33.07	31.15	29.11	27.82	27.30
KEN	26.18	25.37	27.23	30.57	29.54	31.81	34.42
MAUR	64.04	70.35	87.86	91.42	100.81	108.10	100.24
MORO	44.79	49.97	68.67	71.99	73.40	70.17	70.59
NGA	13.78	18.77	15.42	12.48	11.80	12.59	14.61
RSA	124.52	135.34	148.98	139.54	146.09	149.47	67.22
TUN	60.70	59.98	68.53	76.26	75.93	75.74	71.74

Source: World Development Indicators (2015)

The second banking sector development measurement variable was LIQLI. Liquid liabilities of the financial system (M3) as a ratio of GDP (LIQLI) is an indicator that shows the general size of the banking sector by measuring the sector's realisable obligations, relative to the economy of the country, (Levine, 2002; Lakštutienė, 2008; Ahmad & Malik, 2009). Gharthey (2015) further added that these are essentially financial resources set aside for investment to boost production for future consumption, and consequently promote economic growth. As was assessed from Table 3.5, the overall size of the financial system in each of the surveyed economies was measured using liquid liabilities (M3) scaled by GDP. It was found that the largest financial systems were in Egypt, Mauritius and Morocco, respectively, while the smallest were in Nigeria, Cote d'Ivoire and Botswana.

Table 3.5: Liquid liabilities of the financial system (LIQLI)

	2000-2004 average	2005-2009 average	2010	2011	2012	2013	2014
BWA	25.97	32.81	43.53	40.36	45.59	46.26	45.95
CIV	22.62	24.42	33.54	41.24	32.16	33.09	33.98
EGY	82.60	85.04	76.62	73.99	81.53	80.22	78.59
KEN	38.22	39.18	45.10	47.37	43.13	43.80	44.09
MAUR	78.41	88.89	96.76	96.43	95.45	96.37	96.70
MORO	75.90	84.16	104.95	109.13	102.11	103.08	103.86
NGA	19.74	22.05	36.49	32.99	31.97	33.85	34.60
RSA	44.96	44.39	41.49	40.23	43.46	43.46	42.91
TUN	57.75	56.54	62.21	67.17	59.85	60.95	61.93

Source: World Development Indicators (2015)

The last banking sector development measurement variable was CCBA, which is the ratio of commercial bank assets as a share of the sum of commercial bank and central bank assets (CCBA). This indicator measures the degree to which commercial banks allocate savings in the financial system, thereby giving an indication of the overall importance of the various financial institutions (Levine *et al.*, 2002). On average, all of the economies in this study recorded CCBA ratios of above 80, indicating that commercial banks in these countries played a pivotal role in ensuring the efficient intermediation of excess funds in the system to deficient but productive sectors.

Table 3.6: Ratio of commercial bank to commercial and central bank assets (CCBA)

	2000-2004 average	2005-2009 average	2010	2011	2012	2013	2014
BWA	99.09	99.10	99.50	99.69	99.43	99.51	99.52
CIV	75.84	80.14	83.16	80.37	84.36	83.55	82.55
EGY	69.07	71.63	82.14	80.23	79.12	80.62	80.61
KEN	89.63	91.30	94.85	96.13	94.78	94.84	94.96
MAUR	98.44	98.54	98.32	97.43	98.87	98.77	98.64
MORO	94.04	95.56	98.73	99.10	98.37	98.54	98.66
NGA	70.05	78.90	94.36	94.38	92.65	94.15	94.41
RSA	96.58	97.75	99.52	98.59	99.25	99.24	99.22
TUN	99.33	99.45	99.81	99.83	99.75	99.76	99.78

Source: World Development Indicators (2015)

3.8 Chapter summary and conclusion

This chapter gave an overview of foreign direct investment (FDI), foreign portfolio investment (FPI) and financial market development (FMD) trends in Africa. Each component was examined in the specific context of African economies. Patterns on FDI and FPI inflows to Africa were highlighted, as was the nature and extent of domestic financial market development in the selected African countries. It was concluded that the trends of FDI and FPI closely mimic the level of banking sector and stock market development in the selected African countries, thereby underpinning the relative importance of financial market development in these selected African economies.

The next chapter discusses the research methodology adopted in order to fulfil the objectives of this study.

Chapter Four: Research Methodology

4.1 Introduction

This chapter presents the methodologies that were applied to address the research objectives of this study, as stated in Chapter One. The chapter begins with an overview of the data sources and sample size. In addition, the proposed empirical models were specified, while the applicable econometric estimation techniques and diagnostic tests were also addressed. The chapter ends with a synopsis of Granger causality testing, and a summary to conclude the chapter.

4.2 Data and variables

This study employed annual financial and economic data drawn from the World Bank's databases on African Development Indicators and Global Development Finance. Institutional quality variables which measured political stability, as well as the respect for the rule of law, property rights and protection against fraud, rank high on investors' domestic and international decision-making processes. These variables were derived from Kuncic's (2014) institutional quality database.

From a continental population of 54 countries located in Africa, a sample of 13 countries was selected. Our sample of countries was diverse in terms of economic size, governance, and other pertinent variables. Since both foreign direct investment and foreign portfolio investment are dependent on the existence of an active stock market, the sampled countries were Botswana, Cote d'Ivoire, Egypt, Kenya, Mauritius, Morocco, Nigeria, South Africa, and Tunisia. Although there are 18 active bourses on the African continent, the consistently available data for all variables under study only covered the selected countries for a reasonable period of time.

Although we attempted to use a long time series covering the period 1980 – 2014, this was applicable primarily to the FDI dimension of this study. In the case of FPI and certain financial market development variables, data was only available from 2000 – 2014, as some stock exchanges were only recently established, thereby also hindering FPI inflows. Kuncic's (2014) institutional quality data for all countries only ran from

1990 to 2010. Furthermore, Wooldridge (2012) recommended the use of an unbalanced panel where the sample contains some years with unobserved data, on condition that the missing data points are not correlated with the idiosyncratic errors. We limited this exposure by increasing the sample size and reducing the time period under study. It was therefore necessary that data on FPI, FDI and FMD variables be available for a sufficiently adequate period of time to enable this study to be viable, hence, the other African countries were omitted. Table 4.1 reflects details of the variables used in this study, and where they were also applied in similar studies.

Table 4.1: Indicators of FDI, FPI and FMD variables

<i>Variable</i>	<i>Indicator</i>	<i>Similar Studies (Sources)</i>
FDI and FPI inflow variables		
FDIGDP	Ratio of net FDI inflows to GDP	Alfaro <i>et al.</i> (2004); Asiedu (2006); Kholdy & Sohrabian (2008); Otchere, Soumaré & Yourougou (2015)
FPIGDP	Ratio of net FPI inflows to GDP	Agbloyor <i>et al.</i> (2014); Otchere <i>et al.</i> (2015)
Financial market development variables		
SMCAP	Stock market capitalisation of listed companies as % of GDP	Demirguc-Kunt and Levine (1996); Levine & Zervos (1996); Chinn & Ito (2005); Love & Zicchino (2006); Agbloyor <i>et al.</i> (2013); Ojah & Kodongo (2014); Soumaré & Tchana (2015)
SMTVT	Stock market value traded (total value as % of GDP)	Demirguc-Kunt & Levine (1996); Levine & Zervos (1996); Chinn & Ito (2005); Love & Zicchino (2006); Yartey & Adjasi (2007); Allen, Otchere & Senbet (2011); Mahonye & Ojah (2014); Soumaré & Tchana (2015)
PCRED	Domestic credit to the private sector by deposit banks as a share of GDP	Demirguc-Kunt & Levine (1996); Alfaro <i>et al.</i> (2004); Chinn & Ito (2005); Love & Zicchino (2006); Agbloyor <i>et al.</i> (2014); Soumaré & Tchana (2015)
LIQLI	Liquid liabilities of the financial system (M3) divided by GDP	Demirguc-Kunt & Levine (1996); Alfaro <i>et al.</i> (2004); Love & Zicchino (2006); Soumaré & Tchana (2015)

CCBA	The ratio of commercial bank assets to commercial bank and central bank assets	Demirguc-Kunt & Levine (1996); Alfaro <i>et al.</i> (2004); Love & Zicchino (2006); Otchere <i>et al.</i> (2015); Soumaré & Tchana (2015)
Economic and other control variables		
RGDPG	Real GDP growth rate	Ekeocha, Ekeocha, Victor & Oduh (2012); Bekhet & Al-Smadi (2015); Otchere <i>et al.</i> (2015)
REXCR	Real exchange rate	De Santis & Luhrmann (2009); Ekeocha <i>et al.</i> (2012); Otchere <i>et al.</i> (2015)
INFL	% change in GDP deflator	Asiedu (2006); Ahmad & Malik (2009); Otchere <i>et al.</i> (2015)
INFRAS	Log (phone lines per 1,000 people)	Asiedu (2006); Agbloyor <i>et al.</i> (2013); Otchere <i>et al.</i> (2015)
TRDOPN	(Sum of imports and exports) to GDP	Allen & Ndikumana (2000); Agbloyor <i>et al.</i> (2013); Otchere <i>et al.</i> (2015)
KAOPEN	The extent of financial openness using the capital account openness index (KAOPEN), developed by Chinn and Ito (2002; 2006).	Chinn & Ito (2002; 2006); Aizenman, Chinn and Ito (2010); Gammoudi & Cherif (2015)
INTR	The real interest rate as measured by the lending interest rate, adjusted for inflation by the GDP deflator	Agbloyor <i>et al.</i> (2013); Otchere <i>et al.</i> (2015)
NATRES	Total natural resources rent scaled by GDP	Yilmaz, Tag, Ozkan and Degirmen (2014); Agbloyor, Gyeke-Dako, Kuipo & Abor (2016)
INSTQ	Institutional quality, measured by the average of Kuncic's institutional quality variables	Kuncic (2014)
HUMCA	Gross primary school enrolment ratio	Soumaré & Tchana (2015)

Having stated the variables used in this study, we deemed it necessary to elaborate further on the selected variables, prior to discussing the econometric models. We had two main dependent variables in this study, namely foreign direct investment (FDI), and foreign portfolio investment (FPI).

4.2.1 Foreign direct investment and foreign portfolio investment variables

In this study, similar to several earlier empirical studies by Alfaro *et al.* (2004), Asiedu (2006), Kholdy and Sohrabian (2008), and Otchere *et al.* (2015); FDI and FPI inflows were measured as net FDI and FPI inflows, expressed as a share of GDP, for the selected African countries covering the period from 1980 to 2014. Net FDI inflows measure the net inflows of investment from outside the country, made with the intention to acquire a lasting management interest of 10% or more of the voting share in a firm operating in an economy other than the home country of the investor.

The data on FDI for this study was drawn from two World Bank databases: African Development Indicators and Global Development Finance. According to Huang (2003), the absolute size of FDI does not give a full picture of the impact of international capital flow on a country. Hence, he recommended that the size of FDI flows be gauged against the host country economy, that is, FDI is normalised by the economic size of the host country (i.e. GDP).

The presence of FPI in the domestic stock market is an indication of financial liberalisation, and in some instances, international investors may use it to “test the market” before investing in more permanently, non-easily reversible FDI. FPI is considered to be an alternative means of raising additional capital on the domestic market, for those foreign-owned firms (MNCs) that are already established in the country, but wish to expand their operations further. It was against this background that Pal (1998) found that FPI enters an economy through the secondary markets rather than primary markets. The level of FPI invested in a country can further assist to assess whether FDI and FPI are complements or substitutes, and to also establish if FPI precedes FDI and FMD (Granger causality), or vice-versa. FPI was measured as a percentage of GDP in this study.

4.2.2 Financial market development variables

The objective of financial market development is to enhance the capability of a financial market to perform its intermediary role efficiently (Bank of Thailand, n.d.). An efficient, developed financial market is one that, on the supply side offers investors a

wide array of financial assets to meet their different risk appetites, while on the demand side, has a sizeable investment demand from different investors.

The term “financial market development” (FMD) has been frequently used in the literature, but to date there is no consensus on its precise definition. Loosely applied, Soumaré and Tchana (2015) concur that FMD is simply a well-functioning financial sector or market liberalisation. However, Dorrucci *et al.* (2009) provided a key empirical definition of financial market development. According to these authors, domestic financial market development is the ability of a country to allocate savings to investment projects efficiently and effectively within its borders due to (i) the quality of its institutional and regulatory framework, (ii) the size of its financial markets, diversity of its financial instruments, as well as (iii) the performance of the financial markets in terms of efficiency and liquidity.

From the ongoing discussions, the working definition throughout this thesis for “financial market development” (FMD) therefore encapsulated the extant components of domestic financial markets, which were regarded as the conduits for channelling surplus international funds, as well as to raise additional credit and/ or equity capital in the banking sector and/ or the stock market platforms by foreign investors. Due to the lack of depth in financial market development in Africa, and therefore data, with the exception of South Africa which is active in all forms of the named financial markets, this study was restricted only to the banking (credit) sector and stock (equity) markets.

The main contribution of this study was that we investigated the role of domestic financial market development in the attraction of FDI and FPI to the host African country. According to Hearn, Piesse and Strange (2010), stock market development facilitates both FDI and FPI. This is achieved through the acquisition of shares in local firms, thereby supplementing low levels of domestic savings. Agbloyor (2011) added that for African studies, it is imperative to also examine the role of credit markets. Since the banking sector in Africa is much more developed than the equity markets, a significant amount of inward foreign investment is intermediated by banks rather than the stock markets. Hence, while stock markets provide equity finance for investment, the banking sector provides debt finance mobilised at low cost, thereby implying a complementary relationship between the two (Agbloyor, 2011). It was on this basis

therefore, that the study encompassed both stock market development, as well as banking sector development variables.

There is no consensus on the superiority of an overall indicator that measures financial market development. For example, M2 to GDP as a standalone indicator to measure the banking system can sometimes give a biased result, hence other variables of financial market development should be applied to give a holistic picture of the financial system. Liquidity and efficiency of financial markets locally are expected to boost the level of FDI inflows. The more developed the domestic financial market, the easier it becomes for multinational corporations (MNCs), which are the transmission agents of foreign capital flows, to grow and further expand their local operations by borrowing/ raising additional capital from the local financial system. Similarly, the more developed the domestic financial markets, the higher the likelihood of attracting FPI inflows. Earlier empirical studies by Law and Demetriades (2006) confirmed the notion that FMD is enhanced when a country's economy is simultaneously open to both trade and capital flows, as Rajan and Zingales (2003) hypothesised.

Applying a similar approach to Soumaré and Yourougou (2015), Otchere *et al.* (2015), Agbloyor *et al.* (2014), Abor *et al.* (2010) and Beck, Demirgüç-Kunt and Levine (2000), we selected a number of variables which are used to measure financial market development, namely, stock market capitalisation (SMCAP), stock market value traded (SMTVT), domestic credit to the private sector by deposit banks as a share of GDP (PCRED), liquid liabilities of the financial system (M3) scaled by GDP (LIQLI), and the ratio of commercial bank assets to commercial bank and central bank assets (CCBA). Each of these variables were entered into the regressions individually since one of the primary difficulties in analysing the financial development is how to measure it, as there is not one single indicator that enables researchers to measure the level of financial development (Eryiğit, Eryiğit & Dülgeroğlu, 2015).

Both FDI and FPI inflows will be higher in countries with developed financial markets. Furthermore, a positive relationship exists between FDI, FPI and FMD, respectively.

Stock market development variables

In the econometric models and variables, following on from earlier empirical studies by Beck *et al.* (2000a), Alfaro *et al.* (2004), Adjasi, Abor, Osei and Nyavor-Foli (2012), Agbloyor *et al.* (2014), Otchere *et al.* (2015), and Soumaré and Tchana (2015); financial market development comprises of both stock market development and banking sector development. Stock market capitalisation as a share of GDP (SMCAP) measures two aspects: the size of the domestic equity market, as well as financial market depth. SMCAP evaluates the size of the stock market, relative to the country's economy.

According to Mahonye and Ojah (2014), stock market value traded (SMTVT) measures the stock market trading relative to economic activity, thereby giving an indication of the stock market's liquidity. Total value of stocks traded scaled by GDP (SMTVT) measures stock market liquidity on the basis that active stock markets have a higher turnover ratio than less liquid stock markets (Hieroms, 2012). Stock market liquidity does not specifically measure the ease of buying and selling securities, but rather the degree of trade on the stock market.

Prominent studies conducted earlier that applied the same stock market variables include Levine and Zervos (1996), Beck *et al.* (2000a), Hieroms (2012), Mahonye (2014), Mahonye and Ojah (2014), Otchere *et al.* (2015), and Soumaré and Tchana (2015).

Banking sector development variables

With regard to banking sector development, Levine, Loayza and Beck (2000), Mahonye and Ojah (2014), and Soumaré and Yourougou (2015) in their various studies applied some key variables to measure financial intermediation and other services offered by the banking sector, i.e. the level of banking sector development. This was achieved by examining the level of access and usage of financial services provided by the banking sector of a country using three variables: PCRED, LIQLI, and CCBA.

Domestic credit to the private sector by banks (PCRED) refers to financial resources provided to the private sector by the financial sector including deposit money banks and other depository corporations (deposit-taking corporations except central banks), such as through loans, purchases of non-equity securities, and trade credits and other accounts receivable, that establish a claim for repayment (World Bank, n.d.). Credit provided by banks to the private sector as a share of GDP (PCRED) measures financial intermediary activity and the efficiency of channelling savings to investors. It is considered to be a common investment vehicle in countries where the stock market is under-developed (Ghartey, 2015). PCRED is a banking sector activity indicator that examines the value of credits provided by depository institutions to the private sector, gauged against the economy of the country. A high level of credit to the private sector also indicates an abundance of domestic capital, in which case, foreign capital (FDI and FPI) would not be necessary (Anyanwu, 2012).

The second banking sector development measurement variable was LIQLI. Liquid liabilities of the financial system (M3) as a ratio of GDP (LIQLI) is an indicator that shows the general size of the banking sector by measuring the sector's realisable obligations, relative to the economy of the country, (Levine, 2002; Lakštutienė, 2008; Ahmad & Malik, 2009). Liquid liabilities of the financial system (M3) as defined by the World Bank (n.d.) is "the sum of currency (demand, time, savings and foreign currency deposits), and other interest-bearing liabilities of banks and non-bank financial intermediaries". Ghartey (2015) further added that these are essentially financial resources set aside for investment to boost production for future consumption, and consequently promote economic growth.

The last banking sector development measurement variable was CCBA, which is the ratio of commercial bank assets as a share of the sum of commercial bank and central bank assets (CCBA). This indicator measures the degree to which commercial banks allocate savings in the financial system, thereby giving an indication of the overall importance of the various financial institutions (Levine *et al.*, 2002).

4.2.3 Explanatory and control variables

In a number of econometric models, the specified model may be incomplete without the inclusion of control variables, especially in estimations that focus on financial market dynamics. Wooldridge (2012) explained that control variables are used to augment the explanatory power of the main descriptive factors in the econometric model. These variables were carefully selected to ensure the imperviousness of the model to autocorrelation. In econometric estimations, these sets of variables are introduced into the series to validate the behaviour of the dependent variable. The control variables applicable in this study were auxiliary variables that include various economic and institutional quality variables, but do not correlate with the main variables used in this regard.

The real gross domestic product growth rate (GDPG) is presumed to be the most efficient proxy for economic growth (Ekeocha, 2008). According to Anyanwu and Yameogo (2015), the real GDP growth rate is a measure of a country's track record. It serves as an indicator to potential investors of the existence of profitable investment opportunities, as well as the attractiveness of the host country's market (Asiedu, 2013). The real exchange rate (REXCR) is a valuable gauge for macroeconomic stability (Adam & Tweneboah, 2009), which not only serves to entice potential foreign investors on the returns they could make, especially those bringing in flows of FPI, but also domestic importers and exporters. Buckley, Clegg and Wang (2007) suggested that an imperfect capital market is characterised by currency depreciation, which may trigger a false increase in the volume of international capital inflows, and exaggerate the real value of inflows.

Further evidence by Anyanwu (2012) suggested that inflation (INFL), measured as the percentage change in the deflator, could also be used as an indicator of macroeconomic stability. Macroeconomic stability acts as a buffer against currency and interest rate fluctuations in the global market (Reut Institute, n.d.), hence the need in this study to apply both variables of REXCR and INFL since the focus is on FDI, FPI and FMD, which are determined and affected differently by the measures of macroeconomic stability.

Therefore it follows that a high level of domestic inflation, *ceteris paribus*, indicates a Government's inability to stabilise the real economy in a manner that could attract FPI, and better still FDI. Therefore, persistently high inflation rates would be expected to translate to a contraction of domestic savings and private foreign investment (Allen & Ndikumana, 2000; Orji & Mba, 2010). A stable macroeconomic environment promotes FDI and FPI by showing less investment risk.

The lending interest rate adjusted for inflation by the GDP deflator (INTR) is a measure of financial market efficiency as it suggests fiscal stability. While the interest rate reflects a risk-free return of foreign capital, it is also an indicator of the cost of capital in the domestic financial markets. Access to capital at too high a rate could result in a mismatch of banking sector assets and liabilities, which would affect market liquidity, and give rise to inflation, and a depressed economy. A high rate of return and macroeconomic stability would attract increased levels of FDI and FPI to the surveyed African countries.

Trade openness (TRDOPN), measured as the sum of the host country's imports and exports divided by GDP, aided to ascertain whether the host country was adequately receptive to foreign investors to engage in international trade. It was also used to assess the ease of sourcing raw materials required from outside the country, and to export their products to bigger markets outside the FDI-host country, especially when the investor was in export-oriented FDI (Asiedu, 2006).

The extent of financial openness was measured using the capital account openness index (KAOPEN), developed by Chinn and Ito (2002; 2006; 2008). Financial openness (KAOPEN) is calculated as the first standardised principal component of the four variables that indicate the presence of multiple exchange rates (k_1), as well as restrictions on current account transactions (k_2), capital account transactions (k_3), and the requirement to surrender of export earnings (k_4). According to Aizenman, Chinn and Ito (2010), the Chinn-Ito KAOPEN index is normalised between zero and one. A high value of this index indicated that a country was more open to cross-border capital transactions.

Infrastructural quality (INFRAS) was used to assess the level of development of a host country. Generally, it was expected that the higher the quality of infrastructure, the more attractive the host country's potential to foreign investors, particularly those keen on FDI. This variable was initially measured using the log of telephone lines per 1 000 people of the population in the host country (Soumaré & Tchana, 2015; Asiedu, 2006). Campos and Kinoshita (2003) argued that good infrastructure in the form of telephone lines ensures communication between the home and host country investors. Despite this positive observation, telephone lines only account for one aspect of the possible and available infrastructure within an economy.

Later in the study however, a composite index of infrastructural development (INFRAS_INDEX) was generated to reflect the transportation, telecommunication and electricity requirements of foreign investors. Similar to the work of Sahoo, Dash and Nataraj (2010), five variables were identified accounting for air and railway transport, energy and electricity, as well as telephones. Specifically, these were:

- Air freight (air_freight), which is the volume of freight, express, and diplomatic bags carried on each flight stage (operation of an aircraft from take-off to its next landing, measured in metric tonnes times kilometres travelled);
- Electricity consumption (electric_consumption), measured as the production of power plants and combined heat and power plants less transmission, distribution, and transformation losses and own use by heat and power plants, measured in kwh per capita;
- Energy use (energy_use) which is the use of primary energy before transformation to other end-use fuels, which is equal to indigenous production plus imports and stock changes, minus exports and fuels supplied to ships and aircraft engaged in international transport;
- Railways (railways_transport) a proxy of the volume of goods transported by railway, measured in metric tonnes times kilometres travelled; and
- Telephones (telephones_per_1000), which is the number of fixed and mobile telephone subscribers per 1,000 people of the population.

It was expected that there would be a positive and significant relationship between the infrastructural development index and foreign direct investment. Although foreign portfolio investment too, to some extent, also requires basic infrastructure to be in place – telecommunications in the form of telephone lines would suffice for this purpose.

Natural resource endowment (NATRES) was measured using natural resources rent scaled by GDP, as was applied by Agbloyor, Gyeke-Dako, Kuipo and Abor (2016) and Yilmaz, Tag, Ozkan and Degirmen (2014). Traditional measures of NATRES previously used by Asiedu (2002; 2006) were considered to be somewhat out-dated. This was due to the recent discovery in 2007 of new oil and gas deposits in 15 African countries, including Angola, Ghana, Uganda, Tanzania, Zambia, Namibia, Nigeria, and Guinea (Asiedu, 2013). As such, it was important to acknowledge and account for this diversification of natural resources, beyond just oil and minerals. NATRES, as derived from the World Bank's indicators, is the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents and forest rents (Agbloyor *et al.*, 2016; Yilmaz *et al.*, 2014). Natural resources are one of the main reasons why FDI comes to Africa. According to the UNCTAD (1999), about 60% of Africa's FDI is allocated to oil and natural resource. There is expectation of a positive relationship between FDI and infrastructural quality, and FDI and natural resource endowment, respectively.

The level of education in a country determines the costs involved in accessing human capital. This is more so for FDI because some investments are labour-intensive and require an abundance of low-cost labour, whereas some FDI involving R&D may require a higher level of skills. The quality of human capital was measured using education (HUMCA), by applying the primary schooling gross enrolment ratio. This was because after these initial schooling years, with the assumption that basic literacy would be in place, adequate for one to be gainfully employed, with the ability to grasp and carry out instructions given (Mitchell, 2005). The data for the gross primary school enrolment ratio was sourced from the World Bank database.

Lastly, institutional quality (INSTQ) was a complex explanatory variable. We applied Kuncic's (2014) institutional quality data which considered legal, political and economic institutional quality. These three forms of institutions have a bearing on the

decisions made by international investors in that they give an indication of the political stability of the country, and other such factors as expropriation risk, enforcement of contracts, respect for property rights, among others. Each of these INSTQ indicators exerts different influences on FDI, FPI and FMD, as will be shown in this research. The higher the institutional quality, the more attractive the country will be to foreign direct and foreign portfolio investors.

4.3 Econometric model specification

We set out to identify and examine the relationships that exist between FDI, FPI and FMD. We performed empirical assessments of the relationships between FDI and FPI, FDI and FMD, and FPI and FMD, respectively, using various dynamic panel data technique, cointegration modelling and causal analyses for our selected African economies. These techniques have been extensively used in previous studies of similar orientation, albeit using data drawn on different markets and countries (see Enisan & Olufisayo, 2009; Abor *et al.*, 2010; Adjasi *et al.*, 2012; Agbloyor *et al.*, 2013; Agbloyor *et al.*, 2014; Soumaré and Tchana, 2015). Although African financial markets are by far the least developed in the world, their mere existence in all the countries being examined enables one to assess FMD using generally accepted stock market and banking sector variables found in the literature.

According to Iyer, Rambaldi and Tang (2004), evidence exists to support two notions in the research of FPI and financial market development: that FPI inflows further increase the sophistication of domestic financial markets, and that the share of FPI inflows as a fraction of total capital flows increases with financial market development, thereby implying bi-direction causality between FPI and FMD.

An extant literature exists for studies on the FDI-FMD nexus (see Soumaré & Tchana, 2015; Abzari, Zarei & Esfahani, 2011; Azman-Saini *et al.*, 2010; Alfaro, Kalemli-Ozcan & Sayek, 2009; Ang, 2009; Alfaro *et al.*, 2004; Hermes & Lensink, 2003; Omran & Bolbol, 2003). In recent years, literature on the FPI-FMD nexus has also emerged (see Hattari & Rajan, 2011; Durham, 2004; Iyer, Rambaldi & Tang, 2004; Bekaert, Harvey & Lundblad, 2003; Errunza, 2001; Stulz, 1999; Demirgüç-Kunt & Levine, 1996; Claessens, 1995). As such, we strongly believed that if FMD was a commonality in both the FDI-FMD and FPI-FMD nexus studies, then there had to be an alternative

relationship; that of a possible FDI-FPI nexus. The intuition here was that in countries where the financial markets were under-developed, firms could invest directly using FDI as there were limited capital sources within the host country. Also, banks would play the crucial debt intermediary role in the absence of active stock markets. However, if equity markets were adequately developed, then in addition to the capital flows injected by foreign investors, projects could equally be part-financed through debt and/ or equity raised in the host countries' financial markets (Borensztein, De Gregorio & Lee, 1998). Once established, it makes better financial sense for MNCs to raise equity capital from the domestic financial markets.

The relationships between these FDI, FPI and FMD variables have proven to be complex. Factors such as the measures used to proxy financial market development for example, can lead to different conclusions. Generally, researchers have opted to examine the effect of FMD in its decomposed form – that is, the effect of stock market development (SMD) and the effect of banking sector development (BSD) on FDI and FPI, respectively. This was primarily because there was no consensus on a composite index of financial market development. Well-known researchers such as Alfaro *et al.* (2004), Zakaria (2007), Mahmoud (2010), Al Nasser and Soydemir (2011), and Soumaré and Tchana (2015) are some of those scholars who, although examining the impact of FMD, applied SMD and BSD separately in their studies. This approach was intuitive because SMD and BSD affect each international capital flows differently; hence a composite FMD index may not necessarily have captured nor reflected this accurately.

Granger causality tests were conducted between FDI and financial market development variables on 14 Latin-American countries by Al Nasser and Soydemir (2011). They found a unidirectional relationship from the banking sector to FDI, but not the reverse, and also a bidirectional relationship between FDI and stock market development. Azman-Saini *et al.* (2010) used a regression model to study cross-country data on 91 countries between 1975 and 2005. Their objective was to determine the role of financial market development in mediating FDI effects on economic growth. They found strong evidence that the impact of FDI is only felt when domestic FMD attains a certain threshold; otherwise until then, there are no benefits derived from FDI.

Lee and Chang (2009) explored the direction of causality among FDI, FMD and economic growth by applying panel cointegration and panel error correction models for 37 countries using annual data that span 1970 to 2002. Their panel causality tests confirmed a weak short-run relationship among the variables, while a long-run relationship among the same variables was unequivocal. This suggested that there was bi-directional causality between FDI and FMD in the long run, an indication that a complementary relationship existed among the variables (Lee & Chang, 2009).

In another study, Kholdy and Sohrabian (2008) investigated whether FDI can stimulate FMD in corruption-ridden economies. Applying a multivariate Error Correction Model (ECM) to their sample of 22 developing countries, over the period 1976 to 2003, they found strong evidence of bidirectional causality between FDI and FMD, and that FMD tends to attract even more FDI inflows. Zakaria (2007) also studied Granger causality relationships between FMD variables and FDI, using 37 developing countries in a multivariate VECM framework. The author found strong support for FDI having an effect on stock market development (SMD) in developing countries, and vice-versa. On the contrary, he found that FDI has no effect on banking sector development (BSD), as well as that BSD equally has no influence on FDI.

Kholdy and Sohrabian (2005) investigated the interaction between FMD, FDI and economic growth using Granger causality tests on a panel of 25 countries between 1975 and 2002. Their results confirmed bidirectional causality between FDI and FMD, but no evidence was found to support the hypothesis that countries with higher FMD gain significantly more from FDI than countries with under-developed domestic financial markets. The findings of Kholdy and Sohrabian (2005) contradict those of Alfaro *et al.* (2004) who using FDI as a share of GDP, and a financial development measure developed by Beck *et al.* (2000a,b), conducted a cross-country study over the period 1975 to 1995, reached the conclusion that countries with well-developed financial markets benefit significantly from FDI.

In the African context, Adam and Tweneboah (2009) in their study on the impact of FDI inflows and stock market development in Ghana followed Garcia and Liu's (1999) in using market capitalisation as a percentage of GDP as a proxy for stock market development. Using multivariate cointegration tests, Adam and Tweneboah (2009)

established a long-run relationship between FDI, the domestic and US dollar exchange rate, as well as market capitalisation as a percentage of GDP, while the Vector Error Correction Model (VECM) indicated a positive short-run relationship between FDI and stock market development. Otchere *et al.* (2015) studied the causal relationship between FDI and FMD in Africa using data from 1996 to 2009. Using Granger causality tests and multivariate analysis, they found a positive, bidirectional relationship between FDI and FMD, despite the infancy of most African countries' financial market development.

Soumaré and Tchana (2015) examined the relationship between FDI and FMD in 29 emerging market economies from 1994 – 2006. They found that FDI and stock market FMD variables of SMCAP and SMTVT have a simultaneous and positive impact on each other (bi-directional causality), while the results from banking sector variables of PCRED, CCBA and LIQLI were ambiguous and inconclusive. Hanif and Shariff (2016) in their assessment of the relationship between FDI and FMD in five ASEAN countries also concluded the existence of unidirectional causality from FDI to domestic credit to the private sector by banks.

As noted earlier, Soumaré and Tchana (2015) cautioned that when analysing the relationship between FDI and FMD, results would depend on whether the selected FMD variables applied in the study measure development of the stock market or development of the banking sector. They therefore advised that when assessing bi-directional causality, simultaneous equations should be used to account for potential problems of endogeneity. Further, to overcome the problem of endogeneity, we made use of instrumental variables in our GMM model.

Similar to the studies by Soumaré and Tchana (2015) and Otchere *et al.* (2015), we also adopted the methodology of Levine, Loayza and Beck (2000) who used cross-sectional analyses, panel data, and simultaneous equations for the determinants of FDI and FMD in order to assess causality between the two variables. To measure FDI and FPI, we applied the ratios of net FDI (and FPI) inflows as a percentage of GDP. FMD was slightly more complex, hence, five measures were applied. These were stock market capitalisation as a percentage of GDP, stock market value traded as a percentage of GDP, domestic credit to the private sector by deposit banks as a

percentage of GDP, liquid liabilities of the financial system (M3) divided by GDP, and the ratio of commercial bank assets to the sum of commercial bank and central bank assets.

Nyasha and Odhiambo (2015) in their study on the complementarity or substitutability of banks and stock markets, used the above variables to construct their bank-based and market-based financial development indices. Otchere *et al.* (2015) also included other economic, institutional and policy variables considered to be key determinants of FDI, FPI and FMD in their regressions, such as trade openness, infrastructure and exchange rates.

As a preliminary to our detailed empirical analysis, we conducted a descriptive statistical analysis of the variables.

4.3.1 Econometric Estimation

In order to answer the research questions posed, it was necessary to apply relevant econometric techniques to draw inferences from. A pooled cross-sectional time series analysis is often referred to as panel data analysis. According to Baltagi (2008), panel data is the pooling of observations on a cross-section of countries over several time periods. Focusing on macro panels, Baltagi (2008) added that with long time series for macro panels, researchers needed to deal with cross-country dependence, as well as non-stationarity in the times series such as unit roots, structural breaks and cointegration.

Panel data relates to subjects such as individuals, firms or countries (N), over a period of time (T), which necessitates the consideration for the possibility of heterogeneity in the series. The main criticism of panel data is that studies which use lengthy time series on countries but do not consider the effect of cross-country dependence often result in false inferences being drawn. In macro panels for example, not accounting for country-specific variables can cause misspecifications if heterogeneity is ignored (Baltagi, 2008).

However, panel data analyses have proven to offer various estimation benefits. For instance, panel data assumes that subjects under study are heterogeneous. As such,

times-series and cross-sectional studies that do not control for heterogeneity face the risk of reporting biased results (Hsiao, 2003). Estimations in the panel environment, especially with the introduction of orthogonal deviation technique, accommodate these biases. Further advantages of panel data are that they are more informative than snapshot research, give more variability, present less collinearity, allow more degrees of freedom and are generally considered more efficient than time series studies (Hurlin, 2004; Hurlin & Venet, 2004).

Multicollinearity arises in multiple regression analysis when predictor variables are themselves highly correlated. Multicollinearity is not necessarily a problem, if the objective is to simply predict the dependent Y variable from a set of independent X variables. However, the concern of multicollinearity is an issue when we need to understand how the various independent X variables impact Y . Hence, it does not affect the properties of the OLS estimators per se. The sources of multicollinearity can be due to the data collection method adopted, constraints on the model or the population, model specifications and an over-defined model (Gujarati & Porter, 2009).

In various econometric studies, it is common knowledge that the presence of multicollinearity has negative consequences. These estimation biases could manifest in various ways. For instance, it could lead to large variances and covariances, especially in Ordinary Least Squares (OLS) estimations (Gujarati & Porter, 2009). Further observation from these authors suggested that such an estimation bias could render precise estimation difficult, while it could widen the confidence levels of estimation decision criteria, thereby resulting in the erroneous acceptance of the null hypothesis. This occurs when the t ratio of one or more coefficients is likely to be statistically insignificant, and yet we could still obtain a relatively high overall measure of goodness of fit (R^2 value of the model). Gujarati and Porter (2009) further observed that the OLS estimators and their standard errors can be sensitive to small changes in the data, thereby triggering the possibility of multicollinearity.

Gujarati and Porter (2009) proposed various solutions for dealing with multicollinearity, if detected. One could combine cross-sectional and times series data. Pooled data increases the number of observations, thereby improving the accuracy of results obtained from running the econometric estimations. One could also consider dropping a variable, although this may result in specification bias or specification error. Other

alternative solutions for multicollinearity are the transformation of variables by taking the first difference, or adding new data to increase the sample size, and lastly, by employing techniques such as factor analysis or principal component analysis. The reason for differencing is that it is considered necessary in order to smoothen the skewness in the series, thereby avoiding the spurious correlation problems, which can arise when estimating relationships between trended variables.

This section presents the econometric methodology in sequential order to address our research objectives as stated earlier in the chapter. There were two key dependent variables in this study; namely, FDI and FPI. The equations below assisted us in addressing the research objectives.

Our dynamic Generalised Method of Moments (GMM) model had the following general form:

$$y_{it} = \alpha y_{it-1} + \beta x_{it} + \varepsilon_{it} \quad (4.1)$$

where, y_{it} is the dependent variable into country i for time t ; y_{it-1} is the lag of the dependent variable into country i for time $t-1$. α_0 denotes a constant term. ε_{it} is a random error term, which breaks down into $\mu_i + v_{it}$. μ_i represents the time invariant country-specific effect, while v_{it} represents the remainder of the disturbance in the estimated regressions. *Vector* x_{it} denotes all other variables that explain the dependent variable.

For the purposes of our study, we needed to determine whether to use a Fixed Effects Model (FEM) or a Random Effects (also known as error component) Model (REM). The Hausman test is often applied when selecting the appropriate approach between fixed and random effects estimators in panel data. Mundlak (1978) argued that the REM assumes exogeneity of *all* the regressors and the random individual effects. Wooldridge (2010) later added weight to this argument, stating that the RE (or error component) model is based on the assumption that there is no correlation between the regressors (explanatory variables) and the unobserved, individual-specific effects. An FE model, on the other hand, would allow the individual-specific intercept to be correlated with one or more of the regressors (Gujarati & Porter, 2009).

4.3.2 Determinants of FDI and FPI

In addressing the first objective of this study, we considered *Equations 4.2 and 4.3*, respectively in order to confirm the key drivers of FDI and FPI inflows to the selected African countries. The specified models accounted for individual and time effects, like Soumaré and Tchana (2015). The following equations were estimated:

$$FDI_{it} = \alpha_0 FDI_{it-1} + \alpha_1 FMD_{it} + \alpha_2 FPI_{it} + \sum_{n=1}^i \beta X_{it} + \varepsilon_{it} \quad (4.2)$$

$$FPI_{it} = b_0 FPI_{it-1} + b_1 FMD_{it} + b_2 FDI_{it} + \sum_{n=1}^i \beta X_{it} + \varepsilon_{it} \quad (4.3)$$

Where, FDI_{it} and FPI_{it} are the dependent variables measuring the inflows of foreign direct investment and foreign portfolio investment (US\$) as a percentage of GDP into country i for time t , respectively. FDI_{it-1} and FPI_{it-1} represent the lag of FDI and FPI, respectively. FMD_{it} is proxied by different measures of financial market development. α_0 and b_0 denote a constant term, while ε_{it} is a random error term. The error term ε_{it} breaks down into $\mu_i + v_{it}$. μ_i represents the time invariant country-specific effect, while v_{it} represents the remainder of the disturbance in the estimated regressions. *Vector* X_{it} denotes all other variables that explain the inflows of FDI and FPI to African countries, such as infrastructure, trade openness, human capital, institutional quality, natural resources, inflation, exchange rates.

Although Ordinary Least Squares (OLS) has been the estimation of choice for both time series and panel data, the technique has been found to be flawed as it reveals bias behaviour and endogeneity problems (Raheem & Oyinlola, 2013). As such, we chose to utilise dynamic Generalised Method of Moments (GMM) panel estimators for this study with the objective of avoiding spurious results, as well as to enhance robustness checks to our results by assuming that the past value of the explanatory variables is uncorrelated with the error term. The GMM estimation using panel data

has many advantages over other estimations such as the pure time series or cross-sectional estimations. The dynamic GMM panel data estimation method overcomes some of the shortcomings of cross-sectional estimation biases, such as the omitted variable errors, country-specific effects misspecification, endogeneity problems and the use of lagged dependent variables in the regression, which are generally encountered in panel data regressions.

Specifically, we employed the autoregressive distributed lag (ARDL) approach of Pesaran and Pesaran (1997) and Pesaran *et al.* (2001) to test for the existence of relationships between FDI, FPI and FMD, respectively. As already stated, this approach can be applied to series irrespective of whether they are $I(0)$, $I(1)$, or mutually cointegrated. The ARDL approach has several advantages over other approaches such as those developed by Engle and Granger (1987) that require variables to be $I(1)$, as well the methods of Johansen (1988; 1991) and Johansen and Juselius (1990) which are inefficient in multivariate analyses.

According to Pesaran and Pesaran (1997), in ARDL, the series used do not have to be $I(1)$. Further, even with small samples, more efficient cointegration relationships can be determined (Ghatak & Siddiki, 2001). Laurenceson and Chai (2003) also affirmed that the ARDL approach also overcomes the challenges resulting from non-stationary time series data. For instance, non-stationary time series data leads to spurious regression coefficients that are biased towards zero (Stock & Watson, 2003).

This process does not only enhance estimation validity, but also augments the explanatory powers of the estimates. Our selected estimation technique further facilitated the dealing with of heteroscedasticity. In the dynamic GMM model therefore, the instruments for the regressions in differences were the lagged levels of the explanatory variables, while instruments for the regression in levels were the lagged differences of the explanatory variables; the assumption being that even though there may have been correlation between the levels of the explanatory variables and the country-specific effect, there was no serial correlation between those variables in differences and the country-specific effect (Sghaier & Abida, 2013).

It is important to check for dynamics because in order to determine if the lagged endogenous value has an effect on the current value, e.g. does FDI in the past year affect the current level of FDI? This helps in testing for agglomeration effects in that foreign investors may be attracted to countries with more existing foreign investment. Indeed, being less knowledgeable of a country's environment, foreign investors may view the investment decisions of others as a good signal of favourable conditions and invest there too, so as to reduce uncertainty (Anyanwu, 2012; Campos & Kinoshita, 2003).

4.3.3 Principal components analysis

Principal components analysis (PCA) is a method used to model the structure of the variance of a set of variables. We applied this method in order to generate a single composite index of financial market development, as well as infrastructural development for the selected nine African countries. This was necessary as there has been no consensus in the literature on a single most appropriate variable to measure FMD or infrastructural development. The objective of applying principal component analysis (PCA) in this study was to develop uni-dimensional measures of financial market development, based on the identified stock market and banking sector variables, as well as for infrastructural development. This was because using the individual variables independently may not have captured and reflected the status of FMD or infrastructural development accurately and adequately for our African countries (see Sahoo, Dash & Nataraj, 2010; Love & Zicchino, 2006; Demirguc-Kunt & Levine, 1996). The PCA indices for financial market development (FMD_INDEX) and infrastructural development (INFRAS_INDEX) were applied in the regressions for FDI and FPI from establishing determinants, right through to Granger-causality tests.

PCA is achieved by computing the Eigen values of the variance matrix. According to Adnan (2011), PCA transforms data into new variables which are not correlated; while the maximum variation of the original variables is contained in the first few principal components (Jolliffe, 2002). Variables of interest are summarised by a number of mutually independent principal components, of which each principal is the weighted average of the underlying variables (Adnan, 2011). The advantage of applying PCA to construct the composite indices was that the index weights were based on the

correlation of the individual measures of financial market development (stock market capitalisation, stock market total value traded, commercial bank to commercial and central bank assets, liquid liabilities of the financial system, domestic credit to the private sector by banks), as well as infrastructural development (electricity consumption, energy use, railways, air freight and telecommunications). As such, the first principal component for a set of variables is the unit length linear combination of those variables and always contains the maximum variance for any combination. If more than one principal component is generated for the variables, then they are uncorrelated.

According to Johnson and Wichtern (1992) and Huang (2005), after the first principal component, all subsequent principal components maximise the variance between the unit length linear combination and are orthogonal to the prior components, and capture different aspects of the data under consideration. Therefore, in line with the literature and for the purposes of this study, the first principal components are adopted as an aggregate measure of financial market development.

This study used PCA to determine appropriate composite indices for financial market development and infrastructural development in selected African economies using the following equation:

$$f_j = w_{j1}x_1 + w_{j2}x_2 + w_{j3}x_3 + \dots + w_{j\rho}x_\rho \quad 4.4$$

Where,

f_j = estimate of the jth factor

w_j = weight on factor score coefficient

x_j = variable of interest

ρ = number of variables.

The specific equations and index values for financial market development and infrastructural development are captured and discussed in Chapter 5.

4.4 Estimation techniques: testing the relationships between FDI, FPI and FMD in Africa

4.4.1 Unit root and serial correlation tests

Before conducting the eventual pairwise Granger causality tests in this study, it was necessary to first inspect the FDI, FPI and FMD variables for stationarity properties. Stationarity tests are conducted to determine the order of integration of the variables, for the purposes of cointegration tests and regression analyses. Although the selected cointegration testing approach did not require the pre-testing of variables (Ghartey, 2015), we strongly believed that the unit root tests would provide guidance as to whether ARDL was appropriate or not, since ARDL is only applicable for the analysis of variables that are integrated of order zero $I(0)$ or order one $I(1)$ (Nyasha & Odhiambo, 2015). Therefore, unit root tests and ARDL were complementary to each other.

Granger and Porter (2009) identified the unit root test as being the most common test of stationarity (or non-stationarity). Although it is common knowledge that most economic time series are non-stationary, we still needed to test this assumption. There are many various unit root tests available, and the choice of which one to use depends solely on the size and power of the unit root tests (Granger & Porter, 2009). Size refers to the level of significance, while power implies the probability of rejecting the null hypothesis when it is false. Power is more sensitive to the time span of the data, more than the sample size.

Baltagi (2008) argued that unit root testing in time series studies has become popular among applied econometrics researchers, mainly attributable to Maddala and Wu (1999), Choi (2001), Levin, Lin and Chu (2002), and Im, Pesaran and Shin (2003). Maddala and Wu (1999) criticised the common unit root tests such as Dickey-Fuller (DF), the augmented Dickey-Fuller (ADF) and the Phillips-Peron (PP) tests, arguing that they lacked the power to distinguish the unit root null from stationary alternatives. Maddala and Wu (1999) however added that using panel data unit root tests was one way of increasing the power of unit root tests based on a single time series.

The ADF is an improved version of the DF test as it takes cognisance of autocorrelations in residuals, if they exist, by including additional lags of the first differenced variable (Baltagi, 2008). In the ADF test, the number of lagged difference terms is determined empirically using either the Akaike information criteria (AIC) or the Schwarz information criteria (SIC) (Gujarati & Porter, 2009). This is done in order to ensure sufficient terms so that the error term is serially uncorrelated, thereby enabling us to get an unbiased estimate of δ , the coefficient of lagged y_{t-1} . The number of lagged terms was important as the direction of causality depends on it. The outcomes of Granger causality tests are sensitive to the number of lags (Brooks, 2014). The ADF tests the null hypothesis that $\alpha_i = 0$ against the alternative $\alpha_i < 0$. Hence, if the process has a unit root, then $\alpha_i = 0$; otherwise the process is stationary, in which case $\alpha_i < 0$ (Awe, 2012).

The Phillips-Perron ((PP) test on the other hand uses non-parametric statistical methods to overcome serial correlation in the error terms, without the need to add lagged difference terms. As such, the PP test is ranked higher than the ADF because its test statistics have been modified to capture serial correlation and heteroskedasticity (Elliot, Rothenberg & Stock, 1996; Keller, 2012). The Phillips-Perron (PP) test statistics can therefore be viewed as Dickey-Fuller statistics that have been made robust to serial correlation by using the Newey-West (1987) heteroskedasticity- and autocorrelation-consistent covariance matrix estimator. In the PP test, the null hypothesis is that the variable contains a unit root, the alternative is that the variable was generated by a stationary process. According to Gujarati and Porter (2009), the asymptotic distribution of the PP test is the same as the ADF test statistic.

In dealing with panel data, the Levin, Lin and Chu (LLC) test is considered to be more powerful than running individual unit root tests for each cross-section (Baltagi, 2008). The null hypothesis is that each individual time series contains a unit root, against the alternative that each time series is stationary. Two shortcomings of this LLC test, however, are that it relies on the *independence* assumption across all cross-sections, and is therefore not applicable if cross-sectional correlation exists. Also, the assumption that *all* cross-sections have or do not have a unit root is restrictive (Baltagi, 2008). On the upside, the LLC allows for fixed effects, individual trends and

heterogeneous serially correlated errors, particularly when working with N between 10 and 250, and T between 25 and 250 (Baltagi, 2008:277).

The IPS test can be viewed as a combination of the test statistics evidence of many independent unit root tests (Maddala & Wu, 1999). Im, Pesaran and Shin (2003) allow for a heterogeneous coefficient of y_{it-1} and propose an alternative testing procedure based on averaging individual unit root test statistics. The null hypothesis is that each series in the panel contains a unit root $H_0: \rho_i = 0 \text{ for all } i$; against the alternative hypothesis that allows for some (but not all) of the individual series to have unit roots, i.e.:

$$H_0: \rho_i = 0 \text{ for all } i$$

$$H_1: \begin{cases} \rho_i < 0 \text{ for } i = 1, 2, \dots, N_1 \\ \rho_i = 0 \text{ for } i = N_1 + 1, \dots, N \end{cases}$$

To ensure consistency of the panel unit root test, IPS requires the fraction of the individual time series that are stationary to be non-zero, i.e. $\lim_{N \rightarrow \infty} (N_1/N) = \delta$ where $0 < \delta \leq 1$. Baltagi (2008) further adds that the IPS t-bar statistic is the average of the individual ADF statistics. In the event that the lag order is always zero ($\rho_i = 0 \text{ for all } i$), IPS provides simulated critical values for $\bar{t}$ for a different number of cross-sections N , series length T and Dickey-Fuller regressions containing intercepts only or intercepts and linear trends.

As such, we judged the most appropriate unit root tests to apply in the study would be the popular augmented Dickey-Fuller (ADF), the Phillips-Peron (PP), the Levin, Lin and Chu (LLC) and Im, Pesaran and Shin (IPS) unit root tests.

4.4.2 Cointegration tests

Two variables are considered to be cointegrated if they have a long-term or equilibrium relationship between them (Awe, 2012). Cointegration therefore implies that despite being individually non-stationary, a linear combination of two or more time series can be stationary. According to Granger (1986), a cointegration test is a pre-test to detect and avoid spurious regression situations.

In order to check for cointegration, various tests such as the residual-based Dickey-Fuller and augmented Dickey-Fuller tests (Kao tests) [also known as the Engle-Granger (EG) and augmented Engle-Granger (AEG) tests], residual-based LM test, Pedroni tests and Likelihood-based (LR) panel test of cointegrating rank in heterogeneous panel models can be used (Baltagi, 2008). However, according to Pesaran, Shin and Smith (2001), all these methods are applied in cases where the underlying variables are integrated of order one [$I(1)$]; thereby involving pre-testing, and hence introduces a further degree of uncertainty into the analysis of levels relationships.

For the purposes of this study, we decided to apply the autoregressive distributed lag (ARDL) bounds testing approach to cointegration, a method developed by Pesaran, Shin and Smith (2001). This was because the sample size was only approximately 35 years, and therefore not long enough to apply other techniques such as Engle-Granger (1987) residual-based cointegration test and the maximum likelihood test based on Johansen and Juselius (1990) methods (Alhassan & Biekpe, 2016; Frimpong & Oteng-Abayie, 2006; Mah, 2000).

The nominated ARDL methodology, which is based on the estimation of an unrestricted error correction model (UECM), has several advantages over other cointegration tests. The UECM is simple and straightforward in its application compared to the more complex vector error correction model (VECM). The UECM uses both lagged (to estimate the long run model) and differenced (used to estimate the short run model) variables. On the other hand, the VECM assumes that all variables in the model are endogenous, uses vector auto regression (VAR), and is applicable in situations where there is more than one cointegrating relationship in the model.

In a VECM, any type of cointegration relationship is accommodated and the nature of cointegration relationship determines the restrictions that one needs to place in the model. According to Odhiambo (2014), the UECM Bounds Test using autoregressive distributed lags (ARDL), assumes only one cointegration relationship in the model, and is only applied when regressors are either integrated in the $I(0)$ or $I(1)$. However, an important condition is that none of the variables is integrated $I(2)$.

Pattichis (1999) argued that the ARDL model has better statistical properties since it does not push short-run dynamics into the residual term as in the Engle-Granger (1987) technique. According to Persan and Shin (1999), the ARDL method employs a single reduced-form equation set-up, making it easy to implement and interpret. Finally, the ARDL Bounds Testing method has the added advantage of an estimation being possible even when the explanatory variables are endogenous (through simultaneity bias or bi-directional causality), and is sufficient to simultaneously correct for residual serial correlation (Ziramba, 2008).

In order to investigate the relationships between FDI, FPI and FMD, the models below were specified and estimated using the ARDL Bounds testing approach, consisting of estimating an unrestricted error correction model (UECM) as follows:

$$\begin{aligned}\Delta FDI_{it} = & \delta_0 + \delta_1 FDI_{it-1} + \delta_2 FPI_{it-1} + \delta_3 FMD_{it-1} + \sum_{i=0}^m \delta_{1i} \Delta FDI_{it-1} \\ & + \sum_{i=0}^m \delta_{2i} \Delta FPI_{it-1} + \sum_{i=0}^m \delta_{3i} \Delta FMD_{it-1} + \varepsilon_{it}\end{aligned}\tag{4.5}$$

$$\begin{aligned}\Delta FPI_{it} = & \delta_0 + \delta_1 FPI_{it-1} + \delta_2 FDI_{it-1} + \delta_3 FMD_{it-1} + \sum_{i=0}^m \delta_{1i} \Delta FPI_{it-1} \\ & + \sum_{i=0}^m \delta_{2i} \Delta FDI_{it-1} + \sum_{i=0}^m \delta_{3i} \Delta FMD_{it-1} + \varepsilon_{it}\end{aligned}\tag{4.6}$$

$$\begin{aligned}\Delta FMD_{it} = & \delta_0 + \delta_1 FMD_{it-1} + \delta_2 FDI_{it-1} + \delta_3 FPI_{it-1} + \sum_{i=0}^m \delta_{1i} \Delta FMD_{it-1} \\ & + \sum_{i=0}^m \delta_{2i} \Delta FDI_{it-1} + \sum_{i=0}^m \delta_{3i} \Delta FPI_{it-1} + \varepsilon_{it}\end{aligned}\tag{4.7}$$

Where, Δ represents the first difference operator, and the other variables remain as described earlier above. Although it has already been noted that it was not important to test for stationarity in the ARDL framework, we used the Augmented Dickey-Fuller

(ADF), the Phillips-Perron (PP) and Im, Pesaran and Shin (IPS) unit root tests to check for stationarity and whether the variables were not integrated of order two [I(2)].

4.4.3 Vector error correction model (VECM) and Granger causality

Similar to Hajilee and Al Nasser's (2015) study, we advanced the argument that both the banking sector and the stock market have long-run and short-run effects on FDI and FPI in the selected African countries. Both the long-run and short-run effects must be empirically ascertained, as testing only the long-run relationship would lead to incorrect conclusions about the relationships between FDI, FPI and FMD.

As such, the short-run dynamics were analysed by estimating vector error correction models specified as:

$$\begin{aligned}\Delta FDI_{it} = & \delta_0 + \sum_{i=0}^m \delta_{1i} \Delta FDI_{it-1} + \sum_{i=0}^l \delta_{2i} \Delta FPI_{it-1} + \sum_{i=0}^l \delta_{3i} \Delta FMD_{it-1} + \delta_4 ECT_{it-1} \\ & + \varepsilon_{it}\end{aligned}\tag{4.8}$$

$$\begin{aligned}\Delta FPI_{it} = & \phi_0 + \sum_{i=0}^m \phi_{1i} \Delta FPI_{it-1} + \sum_{i=0}^l \phi_{2i} \Delta FDI_{it-1} + \sum_{i=0}^l \phi_{3i} \Delta FMD_{it-1} \\ & + \phi_4 ECT_{it-1} + \varepsilon_{it}\end{aligned}\tag{4.9}$$

$$\begin{aligned}\Delta FMD_{it} = & \lambda_0 + \sum_{i=0}^m \lambda_{1i} \Delta FMD_{it-1} + \sum_{i=0}^l \lambda_{2i} \Delta FDI_{it-1} + \sum_{i=0}^l \lambda_{3i} \Delta FPI_{it-1} + \lambda_4 ECT_{it-1} \\ & + \varepsilon_{it}\end{aligned}\tag{4.10}$$

In the above models, ECT is the error correction term obtained from the cointegration relationships, while its coefficients (δ , ϕ , and λ) represent the speed of adjustment to long-run equilibrium. ε_{it} is the white noise error term and all the other variables are as previously defined.

It was anticipated that after all the models had been run, the results would clarify the relationships between FDI and FPI, and the role of financial market development in the selected African countries of Botswana, Cote d'Ivoire, Egypt, Kenya, Mauritius, Morocco, Nigeria, South Africa, and Tunisia.

4.5 Testing for Granger causality between FDI, FPI and FMD

In order to empirically test for causality, most studies apply the Granger causality test. The Granger causality test is attributed to its initiator, Granger (1969). According to Kar, Nazlıoğlu & Ağır (2011), a simplistic way to explain Granger causality is to apply the presumption that knowledge of past values of one variable (X) help to improve the forecasts of another variable (Y). Hence, if variable X (Granger) causes variable Y, then changes in X should precede changes in Y. Past events (X) cannot be influenced by future events (Y). Granger and Porter (2009) added that in a regression of Y on other variables (including its own past values), if we include past or lagged values of X and that action significantly improves the prediction of Y, then one can conclude that X (Granger) causes Y. The same definition and explanation would apply if Y (Granger) causes X.

4.5.1 Caution on using Granger causality tests

Despite the seemingly numerous advantages of applying Granger causality tests in economic studies, the methodology is by no means perfect. Granger and Porter (2009) cautioned that the existence of a relationship between variables does not prove causality nor the direction of influence. Hence, regression analysis results merely confirm dependence of one variable on other variables, but this does not imply causation.

Some crucial aspects of the standard Granger causality tests were mentioned in several studies for researchers to be aware of. Firstly, Kar *et al.* (2011) warned that there was a need to control for possible cross-sectional country dependence in the panel, as there was a high likelihood that one economic shock in a country may affect the other countries in the study as a result of a high degree of globalisation,

international trade and financial market integration. To address this pitfall, we established the absence of endogeneity in the basic panel estimation (Arellano & Bond, 1991).

A second consideration was made with regard to heterogeneity in the estimated parameters for each country in the panel study. For example, in relationships between foreign direct investment and measurable indicators of financial market development, it was possible to find that a significant relationship exists in some countries, while the opposite may hold true for other countries. Kar *et al.* (2011) conceded that analysing the causality between international capital flows (FDI and FPI) and FMD in the selected African countries may therefore result in spurious results, due to the homogeneity assumption for the countries in our study.

Additional reservations were raised by Zakaria (2007), when he criticised the standard Granger causality tests for assuming stationarity of the time series under study, thereby effectively ignoring time series properties of the variables included in the panel. The problem with this is that if the variables are indeed non-stationary, the test results would be invalid and unreliable. To remedy this, Zakaria (2007) explained that earlier empirical studies have differenced the variables in order to convert the series to stationary. According to Granger (1986), should variables be cointegrated, the model with differenced variables will be mis-specified.

There are some supplementary key aspects to note regarding the Granger causality tests. It is assumed that the variables are stationary. If this is not practically so, then taking the first difference of the variables makes them stationary, if not already stationary in the level form. We also assumed that the error terms entering the causality tests were uncorrelated. However, if this was not the case – then appropriate transformation must occur. Granger causality is sensitive to the selected lag length. The number of lagged terms to be introduced in the causality tests is crucial, as the direction of causality is dependent on the number of lags included. Hence, Granger and Porter (2009) advised that similar to the case of the distributed-lag models, we may use the Akaike information criterion (AIC) or the Schwarz information criterion (SIC) to decide on the number of lags to include.

Finally, it is possible to find spurious causality due to the failure to account for an underlying variable affecting the two main variables. As an example, Granger and Porter (2009) used the GDP-money supply relationship scenario, by bringing in the aspect of short term interest rates. They argued that there was a probability that money supply Granger-causes interest rates, and that interest rates in turn Granger-cause GDP. By not factoring in interest rates, if they supposedly found that it is actually money that causes GDP, the resultant causality between GDP and money may be spurious.

It is common knowledge in economics that if data is non-stationary, the results may portray spurious regressions (Granger & Newbold, 1974). McCallum (2010) described spurious regression findings as those results which suggest the existence of significant relationships among time series variables, when in actual fact no such relationship is present in the data-generating process under study. To overcome this problem, Granger and Porter (2009) recommended the application of multiple-equation systems such as vector autoregression (VAR). VAR models are similar to simultaneous equations in that several endogenous variables are considered together. However, each endogenous variable is explained by its lagged or past values, and the lagged values of all other endogenous variables in the model (Granger & Porter, 2009).

Determining causal relationships between variables using panel data can be challenging and daunting because one has to account for dynamics, as emphasised by Soumaré and Tchana (2015). Having obtained results of the unit root and cointegration tests, we formally proceeded to run the actual pairwise Granger causality tests between FDI, FPI and FMD variables. Four types of causality relationships were examinable: homogenous non-causality (HNC), homogenous causality (HC), heterogeneous non-causality and heterogeneous causality (Kholdy & Sohrabian, 2005; Otchere *et al.*, 2015). These concepts are explained in detail in the next sections.

We considered the following standard specification for testing Granger causality between our variables, observed on T years and N individual subjects (Granger & Porter, 2009; Hurlin, 2004).

$$y_{it} = \alpha_i + \sum_{k=1}^p \gamma^k y_{it-k} + \sum_{k=1}^p \beta_i^k x_{it} + \varepsilon_{it} \quad (4.11)$$

Where, x and y are two stationary variables, i is the country, k is the time lag, parameter ε_{it} are i.i.d $(0, \sigma_\varepsilon^2)$, p is the number of lags and $t \in [I, T]$. The basic assumption here was that the relationship between x and y holds for at least one subset of variables in our sample. Consistent with Hurlin and Venet (2001), we assumed that γ^k are identical for all individuals, and that the regression coefficients β_i^k may have an individual dimension.

The use of panel data improves the efficiency of Granger causality tests by increasing the degrees of freedom, but it can also result in false inferences in the causality tests being drawn, if the existence of heterogeneity between individuals is not accounted for. According to Kholdy and Sohrabian (2005), heterogeneity between individual in cross-sectional data requires permitting different intercept γ^k and slope β_i^k estimates. By not taking cognisance of these differences when one estimates a pooled regression, a biased estimation of individual intercepts and slopes could result, thereby creating incorrect causality conclusions.

Kholdy and Sohrabian (2005) concurred that to take care of heterogeneity, researchers can introduce fixed effects into the model in *Equation 4.11*. Heterogeneity in slopes β_i^k is considered to be the bigger problem. There is a possibility that causality exists only for one subset of heterogeneous individuals rather than the entire sample. In this case, we have two subsets of heterogeneous individuals based on causality relationships. In the event of heterogeneity being overlooked, the causality test results will be misleading and may probably only represent the subset with the larger size. For this reason, we should consider the different sources of heterogeneity in the data-generating process when testing for causality with panel data.

We replicated the econometric framework of Hurlin and Venet (2001) and Kholdy and Sohrabian (2005), where applicable. We tested for the following definitions of causality.

4.5.2 Homogenous non-causality (HNC) hypothesis

This hypothesis assumes no causality relationship exists between the variables, hence we test the null hypothesis of all regression slope coefficients β_i^k being simultaneously equal to zero (for all i and k).

$$H_0: \beta_i^k = 0 \text{ for all individuals } i, \text{ and all lagged values of } x$$

$$H_1: \beta_i^k \neq 0$$

Generally, the test statistics can be estimated using the Wald statistic proposed by Hurlin and Venet (2001) as follows:

$$F_{hnc} = \frac{(RSS_2 - RSS_1) / (NP)}{RSS_1 / [NT - N(1+p) - p]}$$

where NT denotes the total number of observations, RSS_1 being the residual or restricted sum of squares of the model in *Equation 4.11* estimated using the fixed effects method, while RSS_2 represents the corresponding restricted sum of squared residuals obtained under H_0 . If we cannot reject the null hypothesis H_0 , no further testing is required, and we can therefore conclude no causality as x is not causing y in all the N individuals of the sample.

4.5.3 Homogenous causality (HC) hypothesis

After rejecting the null hypothesis in the homogenous non-causality test, we proceed with the homogenous causality test to determine if the regression slope coefficients associated with $x_{i,t-k}$ are identical for all lags. The null and alternate hypotheses are:

$$H_0: \beta_i^k = \beta^k \quad i \in [1, N], k \in [1, p]$$

$$H_1: \beta_i^k \neq \beta_j^k$$

Again, to test the null hypothesis, we estimated the F-statistic using:

$$F_{hc} = \frac{(RSS_3 - RSS_1) / [p(N-1)]}{RSS_1 / [NT - N(1+p) - p]}$$

The models presented above are derived causality propositions, as remodelled forms of *Equation 4.11*. From the remodelled equation, NT denotes the total number of

observations, RSS_1 depicts the residual or restricted sum of squares of the model, while RSS_3 represents the corresponding restricted sum of squared residuals obtained under H_0 . In other words, the assumption that β_i^k are equal for all the individuals for each k and all i holds in every case of the null hypothesis. If one cannot reject the null hypothesis (H_0), one can conclude that the causality is homogenous; otherwise, causality is heterogeneous. According to Otchere *et al.* (2015), heterogeneous causality implies that in some countries there is causality between x and y , but not in other countries; alternatively, it implies that the causality structure is different across countries.

4.5.4 Heterogeneous causality hypothesis

When the HC hypothesis is rejected, it does not mean that there is no causality between variables. It merely implies that the process is non-homogenous; that is, variable x Granger-causes variable y in at least one country, and at most for a subset of the cross-section countries. Heterogeneous causality is influenced by the size of this subset. Therefore, to establish heterogeneous causality, one should perform N causality tests. The null and alternative hypotheses for these tests are:

$$\begin{aligned} H_0: \beta_i^k &= 0 \quad \text{only for individual } i, \text{ and for all lagged values of } x \\ H_1: \beta_i^k &\neq 0 \end{aligned}$$

Again, the Wald test statistic is used to test the null hypothesis as follows:

$$F_{henc}^i = \frac{(RSS_{2,i} - RSS_1)/p}{RSS_1/[NT - N(1+3p) - p]}$$

where NT denotes the total number of observations, $RSS_{2,i}$ being the residual or restricted sum of squares of the model in *Equation 4.11* when the restriction that k coefficients associated with variable $x_{i,t-k}$ are zero only for the individual i . The N individual tests allow us to calculate the corresponding size of the subset for which causality relationships exist. If one cannot reject the null hypothesis H_0 for a subset of individuals, then the data-generating process is indeed heterogeneous and that causality relationships do not exist for the subset. However, if on the other hand the

null hypothesis for all the individuals is rejected, one can conclude that although the data-generating process is heterogeneous, the causality relationships between x and y exist for all the individuals in the panel.

4.6 Chapter summary and conclusion

The main objective of this chapter was to present the methods that were applied to address the research objectives of this study. The chapter began with a detailed discussion pertaining to the sample, data variables, and sources. In addition, the proposed empirical models were specified, and the applicable econometric estimation techniques and diagnostic tests were also addressed.

In summary, we proposed to employ various panel estimations and analyses to establish the direction and strength of the causal links between the variables under study. Specifically, the chapter examined various individual indicators of financial market development with the objective to draw conclusions about their impact on inward foreign direct and foreign portfolio investment flows to selected African countries. We also applied principal component analysis (PCA) to generate composite indices of financial market development and infrastructural development in order to determine the holistic impact of the combined variables vis-à-vis the individual effect of individual proxies.

The first econometric investigation was to conduct simple deterministic tests to establish determinant relationships of the key variables. Thereafter, we assessed the variables for stationarity using the unit root and serial correlation tests. Cointegration testing via the ARDL bounds testing model was suggested and justified. If integration was not of order zero or order one, there was need to apply the VECM to test for both short-run and long-run relationships among the key variables. Afterwards, we conducted Granger causality tests to establish the interrelationships among the variables (Awe, 2012). Conclusions were then drawn as to whether no causality, unidirectional or bi-directional Granger causality exists between the key variables of FDI, FPI and FMD, respectively. All the estimations were carried out using the E-Views statistical software. The next chapter presents the data analysis and discussion of the results from our empirical investigation.

Chapter Five: Data Analysis and Discussion

5.1 Introduction

This chapter presents the study's empirical results, data analysis and discussion thereof, in chronological order as per the stated research objectives and questions.

The specific research objectives of this study were to:

1. Identify key determinants of FDI and FPI inflows in selected African countries.
2. Assess the long-run relationships between FDI, FPI and FMD to selected African countries.
3. Establish the direction of causality between FDI, FPI and FMD, respectively.

The following were the research questions that this study sought to address:

1. What are the key determinants of FDI and FPI inflows in selected African countries?
2. To what extent, and in what way, are FDI and FPI inflows to selected African countries related to FMD in the long run?
3. What is the direction of causality between FDI, FPI and FMD in selected African countries, and how robust are those relationships?

5.2 Empirical results and data analysis

5.2.1 Data

The original data from the World Bank time series indicators consisted of a sample of 13 countries, observed from 1980 to 2014. The Kuncic institutional quality database consisted of information covering the period 1990 – 2010 for all countries. The stock market data, and by default, the FPI data was observed from 1989 to 2014, due to the late establishment of some stock markets under review. Despite using comprehensive databases to source the time series for the initial sample of countries, we still encountered missing information on some of the key dependent and explanatory variables. This effectively reduced the study sample used in the estimations to covering only nine countries, on an annual basis, from 1980 – 2014. The surveyed

African countries were Botswana, Cote d'Ivoire, Egypt, Kenya, Mauritius, Morocco, Nigeria, South Africa, and Tunisia.

In the few instances where random missing values in the raw data for the explanatory variables were encountered, we applied simple moving averages to fill in the gaps, provided that the missing values did not exceed three-year cycles. This was done by taking the moving average of five years (backwards and/ or forwards, depending where in the time series the missing data was) to fill in the missing values on the explanatory variables. Each previously missing data point therefore became the average of all available data points within the moving average window, including the new point itself (Ruedin, 2013). Similar to Addison and Heshmati (2003), we considered the upside of the reliability of results generated by the greater number of observations, to far outweigh the risk of bias from running estimations with missing data.

5.2.2 Descriptive statistics for the annual panel data

This section presents the summary statistics of the variables used in the estimations for the entire sample of African countries in this study. We commenced with examining the determinants of foreign direct investment (FDI) and determinants of foreign portfolio investment (FPI) in the selected African economies using variables identified and discussed in Chapter 4.

The data variables that were applicable in this study were FDIGDP being foreign direct investment measured as a ratio of gross domestic product (GDP), while FDIGDP(-1) represented the first lag of FDI and FPIGDP was the ratio of foreign portfolio investment (FPI) to GDP. HUMCA was the level of education measured by the gross enrolment ratio for primary education. TRDOPN was the sum of imports and exports scaled by GDP, while KAOPEN was a measure of Chinn and Ito's index of capital account openness. INSTQ measured legal, political and economic institutional quality. NATRES were the total natural resources (the sum of oil, gas, coal, forest and mineral resources) scaled by GDP. INFL was the percentage change in the GDP deflator. INFRAS was the log of fixed telephone lines per 1,000 people. For the INTR, we used

the lending interest rate, adjusted for inflation by the GDP deflator, while RGDPG was the real GDP growth rate, and REXCR measured the real exchange rate.

Banking sector development variables included LIQLI being the liquid liabilities of the financial system (M3) divided by GDP, CCBA was the ratio of commercial bank assets divided by commercial bank plus central bank assets and PCRED which was the domestic credit by banks to the private sector, as a percentage of GDP. Stock market capitalisation as a percentage of GDP (SMCAP) and the stock market value traded as a percentage of GDP (SMTVT) represented stock market development. Using pooled estimations, the results are presented in Table 5.2.

Table 5.2: Summary statistics for variables used in the pooled estimation (1980 – 2014)

Variable	Obs	Mean	Std. dev.	Min.	Max.
FDIGDP	315	2.5384	12.4781	-6.8976	220.0027
CCBA	315	84.9239	16.4528	30.6772	99.9982
FPIGDP	290	0.8532	5.6983	-2.4517	80.4750
HUMCA	315	97.7552	14.0608	63.1297	119.8757
INFL	315	9.5592	11.9203	-5.6657	113.0764
INFRAS	315	57.7868	67.5143	1.0267	315.0345
INTR	315	14.4184	4.8941	4.815	36.24
PCRED	315	42.5110	32.1195	6.6405	160.1249
SMCAP	290	36.9983	48.9544	1.8105	278.3918
SMTVT	290	8.1314	21.6165	0.0165	142.1928
TRDOPN	315	73.57416	25.9787	23.6089	137.1121
INSTQ	189	0.4992	0.1215	0.2543	0.7157
NATRES	315	9.2426	12.3902	0.0034	73.4978
RGDPG	315	3.9623	4.2602	-13.1279	33.7358
LIQLI	315	49.8062	22.4802	12.8592	112.8303
REXCR	315	68.6415	147.9861	0.4050	733.0385
KAOPEN	306	-0.5102	1.2994	-1.8889	2.3897

As can be derived from the summary of descriptive statistics in Table 5.2, the pooled results for all the African economies in this study cover the period 1980 – 2014. The descriptive statistics, based on the raw data before any transformations, reflect that

the FDI inflows to Africa as a percentage of GDP were significantly low. The mean of net FDI inflows for the period under review was 2.54% of GDP, with a standard deviation of 12.5. The minimum FDI as a percentage of GDP was -6.90%, while the maximum was 220%. Negative values of FDI indicate that outflows exceeded inflows and can therefore be considered as disinvestment or reverse investment from the relevant country's economy.

With regard to FPI inflows, the average was 0.85% of GDP, with a standard deviation of 5.7. The minimum FPI as a percentage of GDP was -2.45%, while the maximum was 80.48%. Disinvestment is deemed to have occurred in economies where the FPI value is negative, thereby implying that outflows occurred during that period. The low FPI inflows could be attributed to the lowly developed financial markets in Africa, with most businesses depending on the banking sector rather than the stock markets as conduits for raising capital locally.

The descriptive statistics indicate that between 1980 and 2014, domestic credit to the private sector by banks was 42.51% of GDP. As measured by the ratio of commercial bank assets as a share of the sum of commercial bank and central bank assets (CCBA), the sampled countries in our study recorded an average of 84.92%. This reflected the degree to which commercial banks allocated savings in the financial system, and served as a proxy of the overall importance of the banking sector (Levine *et al.*, 2002).

The liquid liabilities of the financial system (M3) divided by GDP (PIQLI) indicated that on average, the general size of the banking sector which reflected the banking sector's realisable obligations, relative to the economy of the country, (Levine, 2002; Ahmad & Malik, 2009; Lakštutienė, 2008) was 50% for all nine countries in the study (Botswana, Cote d'Ivoire, Egypt, Kenya, Mauritius, Morocco, Nigeria, South Africa, and Tunisia) for the period 1980 – 2014.

The average stock market capitalisation and total value traded over the same period were 37% and 8.13%, respectively. Stock market capitalisation as a share of GDP (SMCAP) measured two aspects: the size of the domestic equity market, as well as financial market depth. SMCAP evaluates the size of the stock market, relative to the

country's economy. According to Mahonye and Ojah (2014), stock market total value traded (SMTVT) scaled by GDP, measures the stock market trading relative to economic activity, thereby giving an indication of the stock market's liquidity. Cumulatively and comparatively, this indicates that the banking sector in the selected African countries was more developed vis-à-vis the stock market.

Theoretically, according to Schumpeter (1912), domestic financial markets can have an immense bearing on the allocation of savings. Based on this, scholars such as Alfaro *et al.* (2004) found that developed financial markets not only improve economic growth, but also assist countries to attract international capital flows such as FDI. The findings regarding financial market development (FMD) in African countries concurred with earlier empirical studies by Agbloyor *et al.* (2014) who found that African countries' banking sectors were more developed than the stock markets.

Considering the variables of inflation and interest rates from 1980 to 2014, our descriptive statistics reflected that the average inflation rate for the sample was 9.56% per annum, while interest rates averaged 14.42% per annum. Although the continental inflation rate appeared to be fairly low and stable, both the maximum value of 113.08% and the minimum of -5.67% were recorded by Nigeria in 1995, and in 1998, respectively. The inflation rate was measured by the annual growth rate of the GDP implicit deflator, and showed the rate of price change in an economy as a whole, while the real interest rate was measured by the lending interest rate, adjusted for inflation by the GDP deflator (WDI, 2016).

As both the rate of domestic inflation and interest rates impact on the real effective exchange rate (REXCR), we noted from the assessment that the pooled economies of Botswana, Cote d'Ivoire, Egypt, Kenya, Mauritius, Morocco, Nigeria, South Africa, and Tunisia had widely fluctuating real effective exchange rates. According to the Word Development Indicators (WDI, 2016), the real effective exchange rate is the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs, and expressed as an index number relative to a base year. The average REXCR was 68.84 (base year index 2010 = 100). Furthermore, the real GDP growth rates for

the sampled African countries averaged 3.96% for the period under review, suggesting a low improvement in the GDPs of the sample.

The institutional quality in Botswana, Cote d'Ivoire, Egypt, Kenya, Mauritius, Morocco, Nigeria, South Africa, and Tunisia was measured using Kuncic's (2014) database. This database, which runs from 1990 to 2010, groups over thirty institutional indicators derived from different sources such as the Heritage Foundation, Freedom House, Fraser Institute, International Country Risk Guide (ICRG), World Bank Worldwide Governance Indicators (WDI), Polity and Transparency International into legal, political and economic institutions, with the objective of computing an index of institutional quality to capture the institutional environment (Kuncic, 2014).

Kuncic's database gives different options of institutional quality measurements. The relative institutional quality values which range between -2 and 2, with a mean of zero (0); are calculated using factor analysis to identify latent factor scores for every country every year, within each institutional group. The World Institutional Quality Rankings (WIQR) shows the relative competitiveness of every country in the world, and every year, in terms of the quality of the underlying institutional environment. The cluster membership allocates values for the level of institutional quality to countries, with 1 being really bad, 2 being corrupt, 3 being bad but not corrupt, 4 good and 5 great.

The absolute institutional quality measures are simple averages of legal, political and economic institutional indicators within each group for within country analysis, which are transformed to the interval from zero to one. This permits the tracking of country dynamics, relative to other countries in the world, and also in absolute terms. Kuncic (2014) concluded that a country digressing in terms of institutional quality relative to other countries, may merely be progressing slower than others in absolute terms, or it may be digressing in absolute terms which can then be checked and confirmed against relative and absolute institutional qualities.

For the purposes of this study, due to the comprehensive sources used to compute Kuncic's database, it was the most appropriate for our sampled African countries. We chose to adopt the absolute measures of institutional quality which allowed her to track the country dynamics. Hence, with a pooled mean absolute score of 0.5 for institutional

quality, a minimum of 0.25 (Nigeria in 1994) and a maximum of 0.72 (Mauritius in 2007), the sample of African countries had a medium-high score on the quality of institutions, which may serve to enhance the continent's attractiveness to foreign investors in the future.

The economies of Botswana, Cote d'Ivoire, Egypt, Kenya, Mauritius, Morocco, Nigeria, South Africa, and Tunisia were very open to international trade. This was indicated by the mean level of trade openness for these countries over the period 1980 to 2014, which measured 73.57%. Trade openness was measured as the sum of the host country's imports and exports scaled by GDP, and was used to ascertain whether the host country was adequately receptive to foreign investors to engage in international trade.

We measured the extent of financial openness using the capital account openness index (KAOPEN), developed by Chinn and Ito (2002; 2006; 2008). Financial openness (KAOPEN) is calculated as the first standardised principal component of the four variables that indicate the presence of multiple exchange rates (k_1), as well as restrictions on current account transactions (k_2), capital account transactions (k_3), and the requirement to surrender of export earnings (k_4). According to Aizenman, Chinn and Ito (2010), the Chinn-Ito KAOPEN index is normalised between zero and one. A high value of this index indicated that a country was more open to cross-border capital transactions.

The capital account openness index (KAOPEN) for the economies of Botswana, Cote d'Ivoire, Egypt, Kenya, Mauritius, Morocco, Nigeria, South Africa, and Tunisia indicated an average of -0.5%, a minimum of -1.89% and a maximum of 2.39%, which further justified the low levels of inward FPI into the sampled African economies. According to Quinn, Schindler and Toyoda (2011), a negative value of KAOPEN implies that the economy is closed. Chinn and Ito (2002; 2006) suggested that economies which already have closed capital accounts may attempt to increase the stringency of those controls by imposing k_1 , k_2 , and k_4 types of restrictions, to discourage players in the private sector from circumventing the capital account restrictions. Chinn and Ito (2006) gave credit to the KAOPEN index for its prominence

in measuring the intensity of capital controls, insofar as the intensity is correlated with the existence of other restrictions on international transactions.

In assessing the level of infrastructural development in the sample of African countries between 1980 and 2014, there were only 57 fixed telephone lines per 1,000 people of the population. This confirmed that the level of infrastructural development in Africa remains largely under-developed, despite its importance in facilitating FDI (Asiedu, 2006). However, there was also the likelihood that other measures of infrastructural development would yield different results. For example, infrastructure for efficiency-seeking FDI targeting the manufacturing sectors of countries could probably be better measured using electricity production per 1,000 people of the population, communication expenditure as a percentage of GDP and transport expenditure scaled by GDP (Wheeler & Mody, 1992; Root & Ahmed, 1979). As a result, for the panel data regression, we went further and constructed and applied a composite index of infrastructural development to encompass transport, electricity and telecommunications.

Natural resource endowment, measured as total natural resources (the sum of oil, gas, coal, forest and mineral resources) scaled by GDP, recorded a low mean of 9.24%, despite the fact that most of Africa is attractive to foreign investors due to its abundant deposits of natural resources. Mauritius recorded the lowest total natural resources to GDP of 0.003% in 2013, while Nigeria had the highest level of 73.5% in 1993. This was expected to be the case since the Mauritian economy is primarily driven by its financial services, information and communications technology, manufacturing and tourism sectors, while Nigeria depends mainly on the agriculture and oil sectors. The result was consistent with the study by Asiedu (2006) who concluded that countries which lack natural resources can attract FDI by strengthening their institutions and policy environment. Mauritius, which fared the lowest in natural resource endowment, had the highest institutional quality score, and attracted the most FDI and FPI inflows of all the countries in this study.

The level of education of human capital measured as the gross enrolment ratio for primary level education, on the other hand, emerged as having a mean of 97.76. This result highlighted the importance of labour in having a basic education at the very least

in order to be gainfully employed. Primary school education is presumed to have introduced the elementary skills of reading, writing, counting and listening, which are necessary for the labour force to be able to comprehend basic instructions in their employment activities.

Table 5.3 captures the descriptive statistics applicable to the individual countries in the study, and a brief discussion on a country-level follows thereafter.

Table 5.3: Descriptive statistics for individual country time series (1980 – 2014)

BOTSWANA (BWA)					
Variable	Obs	Mean	Std. dev.	Min.	Max.
FDIGDP	35	3.1883	3.8396	-6.8976	13.4551
CCBA	35	99.0704	0.9601	93.7420	99.6950
FPIGDP	26	0.0899	0.1940	-0.3355	0.5926
HUMCA	35	102.2185	4.7962	87.5678	108.1665
INFL	35	9.3963	5.7323	-0.0883	22.8937
INFRAS	35	46.6348	29.6697	7.1456	86.1715
INTR	35	13.1560	3.3883	7.6667	24.2083
PCRED	35	16.6574	7.5631	6.6405	31.8763
SMCAP	26	22.2986	13.1286	6.2738	53.8182
SMTVT	26	0.82759	0.3155	0.2029	1.4612
TRDOPN	35	101.0849	12.9964	85.8340	124.6491
INSTQ	21	0.6804	0.0402	0.5789	0.7148
NATRES	35	2.8669	2.4001	0.3219	9.3352
RGDPG	35	6.7767	4.7122	-7.6522	19.4500
REXCR	35	4.0185	2.4149	0.7772	8.9761
LIQLI	35	30.1242	9.3761	18.2775	54.0343
COTE D'IVOIRE (CIV)					
Variable	Obs	Mean	Std. dev.	Min.	Max.
FDIGDP	35	1.26736	1.0223	-2.0697	3.5429
CCBA	35	80.2173	4.6582	71.0356	90.4858
FPIGDP	27	0.0695	0.1311	-0.0296	0.6856
HUMCA	35	76.3881	6.8354	67.6739	96.3959
INFL	35	5.1363	9.1612	-4.5233	46.3861
INFRAS	35	10.5314	4.7552	4.5327	19.5236

INTR	35	15.5343	0.8353	13.5	16.75
PCRED	35	24.2670	10.7386	12.2278	42.2638
SMCAP	27	15.2141	10.3311	3.7480	41.0590
SMTVT	27	0.3465	0.3029	0.0359	1.3004
TRDOPN	35	76.6326	11.3752	55.3485	95.0697
INSTQ	21	0.3799	0.0561	0.3158	0.4964
NATRES	35	6.2764	2.6004	2.9073	13.0167
RGDPG	35	1.5917	4.2019	-10.9577	10.7065
REXCR	35	456.2081	137.2494	211.2796	733.0385
LIQLI	35	27.6131	4.2663	21.2104	41.2352
EGYPT (EGY)					
Variable	Obs	Mean	Std. dev.	Min.	Max.
FDIGDP	35	2.3994	2.1736	-0.2045	9.3435
CCBA	35	67.5718	10.7503	50.4914	82.1382
FPIGDP	35	0.0250	0.5193	-2.4517	0.8133
HUMCA	35	95.9870	13.6751	67.3298	114.8487
INFL	35	10.5221	5.9376	0.8700	31.1381
INFRAS	35	68.8725	49.3127	9.3589	157.0041
INTR	35	14.4542	2.3408	11.0083	20.3283
PCRED	35	353.4759	11.5542	13.1806	54.9311
SMCAP	35	25.9771	25.8760	4.0806	106.7521
SMTVT	35	9.0863	12.9428	0.1712	44.1564
TRDOPN	35	52.5582	11.4370	35.3250	82.1767
INSTQ	21	0.4352	0.0233	0.3808	0.4617
NATRES	35	16.0242	8.1246	4.8779	35.4223
RGDPG	35	4.7092	2.1249	1.0788	10.0113
REXCR	35	3.5013	2.1648	0.7000	7.0776
LIQLI	35	79.1421	6.6734	58.3759	92.0352
KENYA (KEN)					
Variable	Obs	Mean	Std. dev.	Min.	Max.
FDIGDP	35	0.53555	0.5667	0.0047	2.5324
CCBA	35	82.3089	10.8084	60.2957	96.1291
FPIGDP	35	0.0600	0.2761	-0.1367	1.5661
HUMCA	35	104.4028	8.5784	90.5523	119.8757
INFL	35	10.6668	7.6956	0.9332	41.9888

INFRAS	35	8.1574	2.8794	3.9518	16.6755
INTR	35	18.6558	6.6135	10.5833	36.2400
PCRED	35	28.9713	3.1443	22.7224	34.8406
SMCAP	35	17.8262	12.7620	5.2844	44.0573
SMTVT	35	1.1370	1.3122	0.1167	5.0319
TRDOPN	35	56.6949	6.3494	47.7028	72.8585
INSTQ	21	0.4666	0.0368	0.4058	0.5248
NATRES	35	4.2816	1.0581	2.9588	7.3136
RGDPG	35	3.7286	2.3384	-0.7995	8.4023
REXCR	35	51.8264	28.6061	7.4202	88.8108
LIQLI	35	41.7679	3.5796	36.3670	49.8057
MAURITIUS (MAUR)					
Variable	Obs	Mean	Std. dev.	Min.	Max.
FDIGDP	35	7.7071	36.9749	-0.6101	220.0027
CCBA	35	91.0773	13.8493	58.0923	99.9982
FPIGDP	27	5.8986	17.9833	-0.3570	80.4750
HUMCA	35	106.2967	4.1388	92.6510	114.6592
INFL	35	7.2296	4.5179	-0.1153	26.5696
INFRAS	35	171.4869	113.91	24.4577	315.0345
INTR	35	16.2128	4.5436	8.5000	21.8742
PCRED	35	54.4394	25.9952	21.4298	108.1031
SMCAP	27	39.5933	18.9896	10.1000	76.5729
SMTVT	27	2.2461	1.3380	0.1750	4.7356
TRDOPN	35	119.7571	11.1191	93.2539	137.1121
INSTQ	21	0.6722	0.0358	0.5651	0.7157
NATRES	35	0.0248	0.0238	0.0034	0.1053
RGDPG	35	4.4453	3.2681	-10.0613	9.7420
REXCR	35	21.5791	7.8913	7.6843	31.9598
LIQLI	35	72.6440	20.8952	40.1675	112.8303
MOROCCO (MORO)					
Variable	Obs	Mean	Std. dev.	Min.	Max.
FDIGDP	35	1.2842	1.3079	0.0029	4.6418
CCBA	35	82.8873	15.6724	51.4604	99.1025
FPIGDP	35	0.1723	0.2426	-0.4537	1.0480
HUMCA	35	88.5803	17.6789	63.1297	117.5122

INFL	35	3.8512	5.2879	-0.6044	29.0474
INFRAS	35	44.3571	33.4891	8.4349	118.4919
INTR	35	10.5821	2.1757	7.0000	13.5000
PCRED	35	38.1687	19.9632	15.0020	73.4027
SMCAP	35	29.7711	28.5663	1.8105	100.3602
SMTVT	35	5.9597	9.2108	0.0633	34.9311
TRDOPN	35	62.0488	12.1045	48.0496	88.3473
INSTQ	21	0.4539	0.0404	0.3457	0.4872
NATRES	35	2.0804	1.7473	0.5348	8.8964
RGDPG	35	4.1476	4.4312	-6.3287	13.4598
REXCR	35	8.5845	1.4275	3.9366	11.3030
LIQLI	35	71.7721	20.9279	42.4743	109.1282
NIGERIA (NGA)					
Variable	Obs	Mean	Std. dev.	Min.	Max.
FDIGDP	35	2.9995	2.3157	-1.1509	10.8326
CCBA	35	64.9175	20.9875	30.6772	96.5213
FPIGDP	35	0.9322	0.4869	-0.5731	2.4287
HUMCA	35	93.2503	8.6516	78.4574	112.8100
INFL	35	22.7186	27.5732	-5.6657	113.0764
INFRAS	35	7.1400	16.1550	1.0267	98.6881
INTR	35	17.5646	5.2808	8.4317	31.6500
PCRED	35	15.0229	6.1877	8.7097	38.3866
SMCAP	35	11.1237	9.0222	4.1251	51.8752
SMTVT	35	1.2163	2.3204	0.0165	10.0775
TRDOPN	35	51.8804	15.8001	23.6089	81.8129
INSTQ	21	0.3565	0.0638	0.2543	0.4474
NATRES	35	38.3581	11.9279	15.5983	73.4978
RGDPG	35	3.7155	7.6701	-13.1279	33.7358
REXCR	35	65.9261	63.7681	0.5468	158.5526
LIQLI	35	25.3327	7.4330	12.8592	37.6967
SOUTH AFRICA (RSA)					
Variable	Obs	Mean	Std. dev.	Min.	Max.
FDIGDP	35	0.9321	1.3100	-0.6749	5.9830
CCBA	35	97.2454	2.1463	91.8431	99.5215
FPIGDP	35	1.0176	2.1083	-1.6414	6.5878

HUMCA	35	100.7492	11.8697	78.0904	117.3399
INFL	35	10.8177	4.7524	5.4491	24.9146
INFRAS	35	90.3709	16.5747	56.1266	124.2839
INTR	35	15.1935	4.2373	8.5000	22.3333
PCRED	35	107.7584	32.6541	55.6000	160.1249
SMCAP	35	151.6133	46.1084	79.6851	278.3918
SMTVT	35	46.0326	44.2853	4.3156	142.1928
TRDOPN	35	52.5494	8.1862	38.6454	72.8654
INSTQ	21	0.5889	0.0626	0.4569	0.64465
NATRES	35	6.1754	4.6321	1.3213	18.6747
RGDPG	35	2.4115	2.3407	-2.1370	6.6206
REXCR	35	5.0370	2.9898	0.7788	10.8527
LIQLI	35	47.2169	4.1857	39.7627	54.4064
TUNISIA (TUN)					
Variable	Obs	Mean	Std. dev.	Min.	Max.
FDIGDP	35	2.5317	1.7178	0.6004	9.4244
CCBA	35	99.0195	0.7188	97.0108	99.8325
FPIGDP	35	0.1915	0.3145	-0.2040	1.2476
HUMCA	35	111.9240	3.5206	104.3589	116.8840
INFL	35	5.6941	3.6026	1.8884	16.0077
INFRAS	35	72.5302	39.7596	17.7550	125.1055
INTR	35	8.4127	0.8856	4.8150	11.0833
PCRED	35	61.8379	7.2072	46.4495	76.2614
SMCAP	35	11.4014	6.2697	4.3367	24.0438
SMTVT	35	1.3277	1.2028	0.1288	3.8260
TRDOPN	35	88.9613	11.1517	67.4851	115.3961
INSTQ	21	0.4593	0.0347	0.3799	0.4917
NATRES	35	7.0959	4.5218	2.1936	18.9336
RGDPG	35	4.1342	2.3930	-1.4470	7.9498
REXCR	35	1.0927	0.3211	0.4050	1.6977
LIQLI	35	52.6428	5.7240	46.0211	67.1735

Note: These are raw data derivations before transformation.

Source: Author's computation

A cross-country analysis of Table 5.3 revealed that despite having the lowest natural resources endowment (0% in 2012, compared to Nigeria's 73.49%) of all the countries

in the study, Mauritius received the highest level of FDI to GDP in 2014 (220%), compared to Botswana's 1993 level of FDI inflows of -6.89%. This was mainly on the back of increased external investments in its ICT and financial services sectors (AfDB, 2015), thereby dispelling the myth that FDI is attracted to African countries mainly by the available natural resources. Further, Mauritius attracted the greatest amount of FPI to GDP in 2010 (80.48%), while Egypt contributed to the sample with FPI outflows of -2.45%.

The finding that FDI to African economies is not necessarily resource-seeking was supported by Musonera, Nyamulinda and Karuranga (2010) who evaluated the institutional FDI fitness model in the East African Community (EAC) bloc, using Kenya, Tanzania and Uganda as their sample, and data drawn from 1995 to 2007. Their research refuted the perception that FDI inflows to Africa were attracted by natural resources, as was evidenced by their study's results for Tanzania and Uganda, which are resource-poor countries. Both these countries were able to attract FDI on the strength and basis of their governments ably establishing macroeconomic and political stability, the introduction of an efficient regulatory framework, the elimination of corruption as well as the development of non-extractive industrial sectors. According to the United Nations Investment Development Organisation (UNIDO, 2014), approximately 79% of FDI into Tanzania was the result of market-seeking motives, while efficiency-seeking and resource-seeking account for 15% and four percent, respectively. Market-seeking MNCs are largely involved in the manufacturing (59%) and the services sectors of the Tanzanian economy. Similarly, over the 1992 to 2002 period, Uganda's secondary sector of beverages, sugar, textiles, plastic, cement, footwear and packaging contributed over 54% of the country's inward FDI stock (Weigratz, 2009).

In terms of financial market development, Mauritius emerged as the front-runner in terms of size and importance of the banking sector (maximum CCBA of 99.99% in 1989), as well as liquid liabilities in the financial system as measured by M3 divided by GDP (LIQLI of 112.83% in 2006). According to Levine *et al.* (2002), the ratio of commercial bank assets as a share of the sum of commercial bank and central bank assets (CCBA), indicates the degree to which commercial banks allocate savings in

the financial system. Based on the evidence at hand, Mauritian banks have proven to be resourceful in this capital resource allocation role.

South Africa, on the other hand, led the pack with the most developed stock market variables [SMCAP (278%); SMTVT (142%)] in 2007, while Morocco and Nigeria lagged behind with 1.8% SMCAP, and 0.02% SMTVT, respectively. Also, South Africa recorded the highest level of domestic credit to the private sector by banks (160% in 2007), compared to Botswana which was at 6.64%. Theories by Schumpeter (1912), Goldsmith (1969), McKinnon (1973) and Shaw (1973) advocated that well-functioning financial markets, by reducing transaction costs, facilitated capital allocation to projects that yield the highest returns and therefore enhanced growth rates. Their theories may well explain the evidence of the Mauritian case in our study.

Interestingly, South Africa recorded its best stock market performance values 15 years after experiencing its worst capital controls under the apartheid regime, which ended when the country gained its independence in 1994. The case of South Africa could be expounded by the earlier studies by Chinn and Ito (2002) who found a significantly strong relationship between capital controls and financial development, and also Huang and Temple (2005) who were of the view that increases in market openness are followed by sustained increases in financial depth. In the years following its Apartheid regime – South Africa experienced accelerated growth in its financial sector.

Further possible explanations for the attractiveness of Mauritius over other countries in our study was that it had the highest level of infrastructural development (315 fixed telephone lines per 1,000 people in 2010, compared to Nigeria's paltry 1 telephone line per 1,000 people), often a key necessity for most FDI (Asiedu, 2006). In addition, Mauritius was the most open economy in terms of both trade and capital accounts, and it scored the highest (0.72 out of 2) for institutional quality as was assessed from Kuncic's (2014) database. Levine (2001) observed that liberalising restrictions in international capital flows enhanced stock market liquidity, and allowing foreign bank presence improved efficiency of the domestic banking system. As such, it was not surprising that the country accounted for the largest portions of both FDI and FPI inflows in the sampled countries.

Nigeria emerged as one of the worst performers insofar as most of our variables were concerned. The country, despite its extensively rich oil deposits as confirmed by its high natural resource endowment level of 73.5%, had the worst infrastructural development (1 telephone per 1,000 people). Also, typical of countries in which oil is present, Nigeria had the worst institutional quality score of 0.25 (out of 2) in 1994. The country was in 1984 the least open to trade (imports and exports). Furthermore, Nigeria was the worst performer in the financial market variables (CCBA, SMTVT, LIQLI). This could be explained by the country's relatively elongated period of poor capital account policies as reflected by Chinn and Ito's financial openness (KAOPEN) variable for Nigeria of -1.8889 between 1989 and 1996, when the country's economy was closed.

In terms of macroeconomic stability, Nigeria recorded the highest and lowest levels of inflation of 113% in 1995, and -5.67% in 1998, respectively. Lastly, of all the sampled countries in the study, Nigeria had both the highest and lowest real GDP growth rates (33.7% in 2004; -13.13% in 1981). According to Anyanwu and Yameogo (2015), the real GDP growth rate is measure of a country's track record. It serves as an indicator to potential investors of the existence of profitable investment opportunities, as well as the attractiveness of the host country's market (Asiedu, 2013). Hence, with an array of other key determinants of FDI to an oil-rich country such as Nigeria, the real GDP growth rate becomes irrelevant in FDI decisions of international investors (Addison & Heshmati, 2003).

Therefore, Nigeria suffered from the "resource curse". According to the resource curse theory, natural resource wealth and exports dependence exposes a country to economic stagnation. Moreover, institutional quality can be assessed against the natural resource curse theory. According to Demissie (2014), poor quality institutions and natural resources rent are a breeding ground for political dysfunction, which in turn gives rise to depressed economic growth and other macroeconomic challenges. This appears to be the situation in Nigeria. The country should make amends to ensure that it derives full benefits from its natural resources endowment, while at the same time stemming out corruption, as the initial steps to revitalise its economy.

5.2.3 Regression model specifications and results from our sampled African countries

As was already discussed in detail in Chapter 4, the dynamic Generalised Method of Moments (GMM) model took the following general form:

$$y_{it} = \alpha y_{it-1} + \beta x_{it} + \varepsilon_{it} \quad (5.12)$$

where, y_{it} is the dependent variable into country i for time t ; y_{it-1} is the lag of the dependent variable into country i for time $t-1$. α_0 denotes a constant term. ε_{it} is a random error term, which breaks down into $\mu_i + v_{it}$. μ_i represents the time invariant country-specific effect, while v_{it} represents the remainder of the disturbance in the estimated regressions. *Vector* x_{it} denotes all other variables that explain the dependent variable.

Econometric model specification for FDI

More specifically, in order to estimate the foreign direct investment (FDI) equation, the following dynamic panel data specification was stated:

$$FDI_{it} = \alpha_0 FDI_{it-1} + \alpha_1 FMD_{it} + \alpha_2 FPI_{it} + \sum_{n=1}^i \beta X_{it} + \varepsilon_{it} \quad (5.13)$$

where, FDI_{it} is the dependent variable measuring the inflow of foreign direct investment and foreign portfolio investment (US\$) as a percentage of GDP into country i for time t ; FDI_{it-1} is the first lag of FDI into country i for time $t-1$. FPI_{it} measures the inflow of foreign portfolio investment (US\$) as a percentage of GDP into country i for time t . FMD_{it} is proxied by different measures of financial market development. α_0 denotes a constant term. ε_{it} is a random error term, which breaks down into $\mu_i + v_{it}$. μ_i represents the time invariant country-specific effect, while v_{it} represents the remainder of the disturbance in the estimated regressions. *Vector* X_{it} denotes all other variables that explain the inflow of FDI to our selected African countries, such as infrastructure, trade openness, human capital, institutional quality, natural resources and inflation.

The Hausman test was used to determine whether to use a Fixed Effects Model (FEM) or a Random Effects Model (REM). The p-value of one for the Hausman test indicates that there is no evidence that the random effects estimates are invalid, thereby making REM more efficient than FEM for this study. Applying random effects would further allow generalisation of inferences beyond just the sample in the study. Due to the failure to reject the null hypothesis, we applied the random effects estimator.

Based on the theoretical framework presented earlier in the literature review chapter, the structure of the selected African economies as discussed in Chapter 3, and the characteristics of FDI inflows to these countries, we estimated an FDI model most suitable for identifying the determinants of FDI inflows attracted towards the selected African countries. The FDI model was specified using the random effects dynamic GMM model as:

$$\begin{aligned}
 FDI_{it} = & \alpha_0 FDI_{it-1} + \alpha_1 FPI_{it} + \alpha_2 HUMCA_{it} + \alpha_3 RGDPG_{it} + \alpha_4 INTR_{it} + \\
 & \alpha_5 INFL_{it} + \alpha_6 INFRAS_{it} + \alpha_7 TRDOPN_{it} + \alpha_8 INSTQ_{it} + \alpha_9 NATRES_{it} + \\
 & \alpha_{10} SMCAP_{it} + \alpha_{11} SMTVT_{it} + \alpha_{12} CCBA_{it} + \alpha_{13} PCRED_{it} + \varepsilon_{it}
 \end{aligned}
 \tag{5.14}$$

where, i denotes country, t denotes time, α_0 is a constant term, ε_{it} is a random error term and the other variables are defined as:

FDI_{it} = the inflow of FDI as a percentage of GDP into country i for time t

FDI_{it-1} = effect of the previous period's FDI measured as the first lag of the FDI inflows scaled by GDP into country i for time $t-1$

FPI_{it} = the inflow FPI inflows as a percentage of GDP into country i for time t

$HUMCA_{it}$ = the gross enrolment ratio for primary education

$RGDPG_{it}$ = the real GDP growth rate

$INTR_{it}$ = the lending interest rate, adjusted for inflation by the GDP deflator

$INFL_{it}$ = the annual rate of inflation

$INFRAS_{it}$ = log of fixed telephone lines per 1000 people of the population

$TRDOPN_{it}$ = the openness index proxied by total trade as a % of GDP

$INSTQ_{it}$ = the measure of legal, political and economic institutional quality

$NATRES_{it}$ = total natural resources scaled by GDP

$SMCAP_{it}$ = stock market capitalisation as a % of GDP

$SMTVT_{it}$ = stock market total value traded as a % of GDP

$CCBA_{it}$ = the ratio of commercial bank to commercial and central bank assets

$PCRED_{it}$ = domestic credit by banks to the private sector as a % of GDP.

The random effects dynamic GMM model regression results are shown in Table 5.4.

Table 5.4: Regression results on the determinants of FDI in selected African economies using random effects model

Variable	t-stat (std error)	Coefficient
Constant	-5.4667*** (8.0660)	-44.0943
CCBA	4.5008*** (0.9308)	4.1894
FDIGDP(-1)	3.1177*** (0.1179)	0.3677
FPIGDP	8.3238*** (0.2389)	1.9889
HUMCA	2.2808** (1.0947)	2.4968
INFL	4.3801*** (0.0900)	0.3941
INFRAS	3.8039*** (0.2284)	0.8688
INTR	2.1791** (0.3712)	0.8088
PCRED	-3.8083*** (0.3545)	-1.3499
SMCAP	3.1703*** (0.2437)	0.7727
SMTVT	-4.7308*** (0.1506)	-0.7123
TRDOPN	4.1955*** (0.5681)	2.3834
INSTQ	-5.7488*** (0.9714)	-5.5842
NATRES	4.8390*** (0.1378)	0.6668
RGDPG	-1.9278* (0.0953)	-0.1837

Note: FDIGDP the ratio of foreign direct investment (FDI) to gross domestic product (GDP). FDIGDP(-1) is the first lag of FDI. CCBA is the ratio of commercial bank assets divided by commercial bank plus central bank assets. FPIGDP is the ratio of foreign portfolio investment (FPI) to GDP. HUMCA is the level of education measured by the gross enrolment ratio for primary education. INFL is the percentage

change in the GDP deflator. INFRAS is the log of fixed telephone lines per 1000 people. INTR is the lending interest rate, adjusted for inflation by the GDP deflator. PCRED is domestic credit by banks to the private sector, as a percentage of GDP. SMCAP is the stock market capitalisation as a percentage of GDP. SMTVT is the stock market value traded as a percentage of GDP. TRDOPN is the sum of imports and exports scaled by GDP. INSTQ is a measure of legal, political and economic institutional quality. NATRES is total natural resources (the sum of oil, gas, coal, forest and mineral resources) scaled by GDP. RGDPG is the real GDP growth rate.

Standard error is in the parentheses.

Instrument rank: 16. J-statistic: 4.3369; Prob(J-statistic): 0.3730

* significant at 10%; ** significant at 5%; *** significant at 1%.

With reference to Table 5.4, having adopted the dynamic GMM, we tested for agglomeration effects by regressing the current FDI inflows to past FDI inflows and other explanatory variables. According to Anyanwu (2012), it is possible that agglomeration economies exist since foreign investors may be attracted to countries where foreign investments already exist. Past levels of FDI are considered to have a signalling effect, and therefore indicate whether a country is a worthwhile investment destination or not. In this study, the agglomeration effects were proxied by the first lag of the dependent variable. The results, which are in line with the findings of Anyanwu (2012), confirm that there is a positive and high significance between FDI and agglomeration effects in our selected African economies.

Foreign portfolio investment (FPI) was found to have a positive and highly significant effect on FDI inflows in Africa. Evidence from Pfeffer (2008) who theoretically assessed the relationship between FDI and FPI supports the findings of this study. She found that firms often pursue international diversification through combined investment strategies (FDI and FPI together, as opposed to FDI only or FPI only), hence making FDI and FPI complementary in nature.

An empirical study by Noman, Rahman and Naka (2015) also confirmed the complementarity between FPI and FDI flows. Using a panel of 45 countries from 2001 – 2009, and the two-stage least squares (TSLS) methodology approach, they examined the relationship between FPI and FDI. Noman *et al.* (2015) found statistically significant relationships between the two flows, and concluded that the impact of FPI on FDI is greater than the impact of FDI on FPI at an aggregate level across national borders. Similarly, Xue-jun Kang (2006) also examined the relationship between inward FDI, FPI and economic growth in America using a VAR model. They found that

a complementary relationship exists between FDI and FPI, noting that the influence of FPI on FDI was stronger than that of FDI on FPI.

Human capital had a positive and significant effect on FDI. The positive impact of human capital on FDI was reflective of the fact that foreign investors were not only interested in low-cost labour but also quality human capital. As such, although it was expected that the presence of low-cost labour would be attractive for FDI, the evidence highlighted that human capital was in fact not as significant as other determinants in attracting FDI inflows to the sampled African countries. This may also have been due to the perceived role played by natural resources in attracting FDI to most African countries (Anyanwu, 2012; Asiedu, 2006). By nature, most natural resource extraction is more equipment-based (industrialised) rather than labour-capital intensive. According to Campos and Kinoshita (2003), factor-endowments trade theory postulates that FDI is attracted to countries with lower wages and abundant natural resources.

Financially, FDI was considered to be forward-looking in terms of expectations on return on investment. As such, macroeconomic stability was deemed to be of paramount importance in attracting FDI inflows. The inflation rate was considered an appropriate gauge for economic stability due to the relationship between high inflation and economic instability, as deduced from the correlation matrix (see Table A5.3 in Appendix 1 below). An increase in the inflation rate, results in a corresponding decrease in the real GDP growth rate of a country. According to Sayek (2009), high inflation rates are accompanied by low FDI inflows, and vice-versa. A high level of inflation would be indicative of weak economies. High rates of inflation would quickly erode the value of any capital that arrives in the host economy as foreign investment.

The result for inflation in the study portrays that inflation in our sample of African countries had a positive and highly significant impact on FDI inflows. A revisit to the descriptive statistics earlier in Table 5.2 revealed that the mean inflation rate in the sample of African economies was 9.56%, with a minimum of -5.66%; hence it was likely that these low rates of inflation in fact enhanced the economies' attraction to foreign investors. The results were supported by the findings of an empirical study by

Asiedu (2006) who in examining determinants of FDI to Africa, found that low inflation attracts FDI to Africa.

Pull factor theories highlight the importance of the domestic economic environment. Various scholars identified pull factors for foreign capital flows as high domestic interest rates, low domestic inflation, increased integration of domestic capital markets with global ones, high growth potential and trade openness, as well as the adoption of sound domestic macro (fiscal) and micro (monetary) economic policies (Sarno *et al.*, 2015; Agenor & Montiel, 1999; Ul-Haque, Mathieson & Sharma, 1997; Calvo *et al.*, 1996).

Interest rate (INTR) was a proxy for the real rate of return on capital, measured as the lending interest rate, adjusted for inflation by the GDP deflator. While the interest rate reflects a risk-free return of foreign capital, it is also an indicator of the cost of capital in the domestic financial markets. Hence, the interest rate is of significance to foreign investors now, and in the future for when the need to raise additional capital locally from the banks, money and bond markets in the host nation arises. This finding can be justified using capital market theory which postulates that home country MNCs based in strong currency areas can borrow at a lower interest rate than host country firms because portfolio investors overlook the foreign aspect of home country MNCs. This gives home country firms the borrowing advantage because they can access cheaper sources of capital for their overseas affiliates and subsidiaries than what local firms would access the same funds for (Aliber, 1970; 1971). The interest rate was found to have a positive and highly significant effect on FDI inflows.

The presence of good quality infrastructure, which was measured as the number of fixed telephone lines per 1,000 people of the population, reflected a positive and highly significant impact on FDI inflows towards African countries. The results reaffirmed the significance of the presence of basic infrastructure attracts foreign investors. Telephones ensure reliable and constant communication between the home and host country investors. However, infrastructural development, especially the presence of fixed telephone line services, is not important for natural-resource based foreign investment. Asiedu (2002) asserts that this type of FDI tends to be directed towards

extractive industries, most of which are based in remote areas which lack basic amenities such as water, electricity and roads.

Location-based theories of FDI suggest that FDI location is influenced by firm (microeconomic) behaviour insofar as the motives of its location, that is, whether it is resource, market, efficiency or strategic asset-seeking. However, the overarching decision is actually based on economic geography, which is a macroeconomic decision as it takes cognisance of country-level characteristics (Popovici & Calin, 2014). The theories therefore explain the success of FDI among countries based on the national wealth of a country, such as its natural resources endowment, availability of labour, local market size, infrastructure and government policy regarding these national resources.

Trade openness (TRDOPN), which was measured using the value of imports and exports as a share of GDP, emerged as bearing a positive and highly significant impact on FDI. Kojima and Ozawa (1984) developed a theoretical model in Japan, extending the neo-classical theory of factor endowments to explain trade in intermediate products. Kojima and Ozawa (1984) argued that FDI occurs if a country has comparative disadvantage in producing one product, while international trade depends on comparative advantage. Under these circumstances, FDI and international trade are complementary, and result in a dynamic reorganisation with associated gains for all countries involved. As such, a country which is open to trade will equally be attractive to potential foreign investors.

In line with Addison and Heshmati (2003), the result of the study suggested that in countries where international trade was important, FDI inflows were equally important. This is often reflected in the policies pursued with the agenda of attracting more foreign investors. Morisset (2000) also concluded that countries with capital controls and restrictive trade policies shun FDI inflows, while open economies attract more inward FDI; hence the finding by most empirical studies of a positive relationship between openness and FDI inflows.

Institutional quality (INSTQ) measures reflect the effectiveness of the rule of law, the level of corruption, enforceability of legal contracts and stability of the government, as

per Kuncic's (2014) institutional quality measures encompassing legal, political and economic institutional indicators. Poor institutional quality has a negative impact on the ability to attract FDI inflows. The relationship between FDI and institutional quality has been extensively studied. On the one hand, Ibrahim, Elhiraika, Hamdok and Kedir (2005) found that political and institutional risk factors were insignificant in explaining FDI inflows to Africa. On the contrary, Asiedu (2006) examined the role of natural resources, market size, government policy, institutions and political stability in African countries. She found that good quality institutions attract more FDI, although corruption and political instability hinder FDI inflows to Sub-Saharan countries. Subsequently, Asiedu and Lien (2011) again examined the effect of institutions between resource and non-resource exporting countries. They found that foreign investors preferred democratic governments when operating in non-resource exporting countries, but preferred less democratic governments when based in resource-exporting countries. This preference by foreign investors is informed by the work of Li and Resnick (2003), who found that countries that cannot guarantee property rights protection to foreign investors are expected to remedy that shortcoming with incentives such as tax holidays or exclusive rights to natural resources, which ultimately still works in favour of the FDI firm.

Other scholars such as Levine and Zervos (1996), Rowland (1999), and De Santis and Luhrmann (2009) also found that poor quality institutions, high taxes and transaction costs inhibit on the freedom of foreign investors to bring in the much sought-after capital from abroad. Hence, in order for African countries to attract higher levels of FDI inflows, they need to improve the quality of their institutions. Our INSTQ result was negative and highly significant, thereby confirming the postulation that foreign investors are wary of the adverse impact of host country's institutional quality, particularly in resource-rich countries such as Nigeria.

Natural resource endowment (NATRES), which was measured as total natural resources rent scaled by GDP, as was applied by Yilmaz *et al.* (2014) and Bokpin, Mensah and Asamoah (2015), was found to have a positive and highly significant influence on FDI inflows to the African economies. The measure of NATRES accounted for the diversification of natural resources in Africa, beyond just oil and minerals. Natural resources are one of the main reasons why FDI comes to Africa.

According to the UNCTAD (1999), about 60% of Africa's FDI is allocated to oil and natural resource. There is an expected positive relationship between FDI and infrastructural quality and natural resource endowment, respectively. Despite the growing importance of natural resources in influencing FDI decisions, foreign investors have also increasingly become cautious of investing in natural resource FDI due to the long-term commitment, heavy capital investments and growing political instability in Africa (Addison & Heshmati, 2003). In addition, Asiedu and Lien (2011) found that natural resources (both oil and minerals) undermined the positive impact of democracy on FDI inflows. Again, the results conform with the factor-endowments trade theory which advanced the argument that FDI is attracted to countries with abundant natural resources (Campos & Kinoshita, 2003).

Real GDP growth rate (RGDPR) was negative and weakly significant, in terms of attracting FDI inflows to Africa. The finding was in line with the research of Anyanwu and Yameogo (2015). The real GDP growth rate measures a country's track record, and serves as an indicator to potential investors of the existence of profitable investment opportunities (Anyanwu & Yameogo, 2015), as well as the attractiveness of the host country's market (Asiedu, 2013). With an array of drivers of FDI to African countries such as natural resource endowment, adequate infrastructure and skilled human capital, the real GDP growth rate of such countries becomes irrelevant in FDI decisions of international investors as these and other variables such as the rate of inflation, a favourable exchange rate and interest rate regime can make up for the depressed economic growth rate (Addison & Heshmati, 2003).

In order to explain the FMD findings, the theory of institutional FDI fitness which focuses on a country's ability to attract, absorb and retain FDI, suggested that a country's ability to adapt, or to fit to the internal and external expectations of its investors, gives it the upper hand in harnessing FDI inflows (Wilhems & Witter (1998). In this instance, it was the presence of developed banking and stock markets which determined the "fitness" of our sampled African countries to harness FDI inflows. Agbloyor *et al.* (2014) also theoretically expounded the role of financial markets as being to facilitate the liquidity and tradability of assets, provide alternative avenues for risk diversification, reduce information asymmetry, enhance savings mobilisation and the attraction of foreign capital, as well as improve corporate governance of firms.

With regard to the financial market development variables, stock market capitalisation (SMCAP) and commercial bank assets to commercial bank plus central bank assets (CCBA) were both positive and highly significant. SMCAP measures the size of the domestic equity market, as well as overall financial market depth. CCBA measures the degree to which commercial banks allocate savings in the financial system, thereby giving an indication of the overall importance of the various financial institutions (Levine *et al.*, 2002). The results confirmed that the stock market and domestic banking sector were important drivers of FDI inflows, as it was these financial markets that foreign investors could turn to in order to raise additional capital in the future. This importance of financial market development holds true in developed countries whose stock markets are more advanced and sophisticated than those in developing countries (Soumaré & Tchana, 2015).

Domestic credit to the private sector by banks (PCRED) and stock market total value traded (SMTVT) had a negative and highly significant effect on FDI inflows into the selected African economies. This confirms the proposition that a high level of credit to the private sector indicates an abundance of domestic capital; hence there would be no need for FDI inflows into these economies (Anyanwu, 2012). In addition, according to Mahonye and Ojah (2014), stock market value traded (SMTVT) measures the stock market trading relative to economic activity, thereby giving an indication of the stock market's liquidity. Although PCRED measures banking sector intermediation, and by default liquidity, while SMTVT measures stock market liquidity, the result confirmed that where there was adequate access to capital in the domestic market, FDI ceased to be necessary; hence FDI could be considered a substitute for low levels of domestic credit to the private sector by banks.

Econometric model specification for FPI

Similar to the approach in identifying the determinants of FDI inflows to the selected African economies in this study, we estimated a dynamic GMM panel data model for FPI. The following dynamic generalised method of moments (GMM) model to estimate the foreign portfolio investment (FPI) equation was made:

$$FPI_{it} = b_0 FPI_{it-1} + b_1 FMD_{it} + b_2 FDI_{it} + \sum_{n=1}^i \beta X_{it} + \varepsilon_{it} \quad (5.15)$$

where, FPI_{it} is the dependent variable measuring the inflow of foreign portfolio investment as a percentage of GDP into country i for time t , FPI_{it-1} is the first lag of the dependent variable into country i for time $t-1$. FDI_{it} measures the inflow of foreign direct investment (US\$) as a percentage of GDP into country i for time t . FMD_{it} is proxied by different measures of financial market development. b_0 denotes a constant term, ε_{it} is a random error term, while $Vector X_{it}$ denotes all other variables that explain the inflow of FPI to our selected African countries, such as financial openness, real exchange rates, and other such factors.

Based on the theoretical framework presented earlier in the literature review chapter, the structure of the selected African economies as discussed in Chapter 3, and the characteristics of FPI inflows to these countries, in the presence of dynamics for the data set, the following random effects GMM model for FPI was found to be the most appropriate estimation technique:

$$FPI_{it} = b_0 FPI_{it-1} + b_1 FDI_{it} + b_2 SMCAP_{it} + b_3 REXCR_{it} + b_4 KAOPEN_{it} + b_5 LIQLI_{it} + b_6 RGDPG_{it} + \varepsilon_{it} \quad (5.16)$$

where, i denotes country, t denotes time, b_0 is a constant term, ε_{it} is a random error term and the other variables are defined as:

FPI_{it} = the inflow of FPI as a percentage of GDP into country i for time t

FPI_{it-1} = the first lag of the FPI inflows scaled by GDP into country i for time $t-1$

FDI_{it} = the FDI inflows as a percentage of GDP into country i for time t

$SMCAP_{it}$ = stock market capitalisation as a % of GDP

$REXCR_{it}$ = real exchange rate

$KAOPEN_{it}$ = Chinn and Ito's capital account openness index

$LIQLI_{it}$ = liquid liabilities of the financial system (M3) as a % of GDP

$RGDPG_{it}$ = real GDP growth rate.

The random effects GMM model for FPI regression results are shown in Table 5.5.

Table 5.5: Regression results on the determinants of FPI in selected African economies using random effects model

Variable	t-stat (std error)	Coefficient
Constant	-3.2615*** (4.4985)	-14.6718
FPIGDP(-1)	0.2614 (0.2833)	0.0740
FDIGDP	3.5791*** (0.9514)	3.4050
SMCAP	-2.1561** (1.8059)	-3.8937
REXCR	2.6609*** (0.6558)	1.7451
RGDPG	0.7165 (0.6384)	0.4574
KAOPEN	-0.5281 (0.6098)	-0.3220
LIQLI	3.5414*** (1.4119)	5.0003

Note: FPIGDP is the ratio of foreign portfolio investment (FPI) to GDP. FDIGDP(-1) is the first lag of FPIGDP measuring agglomeration effects. FDIGDP is the ratio of foreign direct investment (FDI) to gross domestic product (GDP). SMCAP is stock market capitalisation as a percentage of GDP. REXCR is the real exchange rate. RGDPG is the real GDP growth rate. KAOPEN is Chinn and Ito's index of capital account openness. LIQLI is liquid liabilities of the financial system (M3) divided by GDP. Standard error is in the parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1%.

The theory of FPI has traditionally been drawn on macroeconomic variables, primarily interest rate differentials and exchange rate fluctuations (Dunning & Dilyard, 1999). This study found that FPI to the selected African economies was determined by the previous periods' FPI inflows, FDI, stock market capitalisation, the real exchange rate, real GDP growth rates, liquid liabilities and capital account openness. Similarly, in examining determinants of FPI in six developing Asian countries, Agarwal (1997)

found that inflation, real exchange rates, index of economic activity and stock market capitalisation are the most statistically significant factors. Likewise, Garg and Dua (2014) conducted a study on macroeconomic determinants of FPI in India between 1995 and 2011. They found that broadly, an appreciating host country currency and strong domestic output growth gave rise to FPI inflows.

Similar to the regression for the FDI model, the agglomeration effect was positive, but not significant in the case of FPI. This could be partially explained by the correlation that exists between FDI and many of the variables which would ordinarily give rise to FPI as a standalone flow. However, since this study was examining the FDI and FPI inflows as a combined strategy, we were more interested in the present evidence. Indeed, while previous levels of FPI may give positive signals to prospective investors, there are clearly possibly other more pertinent determinants which foreign investors are interested in examining prior to investing in a new country. The herd effect does not necessarily seem to apply in the case of FPI, as it did with FDI. The agglomeration effects were proxied by the first lag of the dependent variable, i.e. $FPI_{GDP}(-1)$.

Foreign direct investment (FDI) was found to have a positive and highly significant effect on FPI inflows. Pfeffer (2008) theoretically assessed the relationship between FDI and FPI, and found that firms often pursue international diversification through combined investment strategies (FDI and FPI together, as opposed to FDI only or FPI only), hence making FDI and FPI key strategic complements. Empirical studies that give credence to our findings were conducted by Noman *et al.* (2015), as well as Xuejun Kang (2006). Both studies confirmed this complementarity between FPI and FDI flows when they concluded that a positive and complementary relationship exists between FPI and FDI, and that the impact of FPI on FDI is greater than the impact of FDI on FPI.

Alfaro *et al.* (2004), in examining the role of financial market development (FMD), noted that countries with more sophisticated financial markets are more likely to gain from FPI inflows. That is because as the level of inbound FDI increases, local financial markets develop even further, giving rise to FPI opportunities, hence they gain twice – sophistication of their local markets and also an inflow of additional foreign capital in

the form of FPI. Alfaro *et al.* (2004) draw attention to the fact that despite the seemingly obvious role of financial markets, the literature ignores its importance.

Due to the presence of lowly developed financial markets in Africa, particularly stock markets, our study found a significantly weak and negative relationship between FPI and stock market capitalisation (SMCAP). This was the assumption made since South Africa and Nigeria account for the higher levels of stock market development on the continent. Foreign investors to our selected African economies were not attracted to the domestic stock markets as much as they were to the local banking sector, not only as a result of the undeveloped equity markets but also the stringent policies regarding dividend repatriation and foreign ownership caps imposed in most of the African stock markets.

On the other hand, liquidity (LIQLI) in the form of liquid liabilities (M3) had a highly significant influence on FPI inflows. This was perhaps due to the fact that FPI is a short-term capital flow and investors want the peace of mind of knowing that they will be able to liquidate their investments at short notice, and exit the host country financial markets, without experiencing time bottlenecks, which could potentially harm their capital outlays and returns.

Capital account openness (KAOPEN) in Africa was also found to have a negative but insignificant impact on inward FPI flows. Okada (2013) argued that capital account openness alone might actually be inadequate to attract FPI, as international capital inflows are also dependent on a country's institutional quality. Hence, to fully benefit from FPI, countries need to be both financially open, as well as have good institutional quality. This is evident in the case of Mauritius which had the best institutional quality, had the most open capital account and received the largest inflows of both FDI and FPI among the nine countries in this study. Despite the relaxation of capital controls in most countries selected for this study, there may be other factors which foreign investors take into account when deciding whether to use FPI as an investment route into Africa.

The relationship between FPI and real GDP growth rate (RGDPR) was positive but insignificant. Real gross domestic product growth gives potential investors an

indication of the host country's macroeconomic and institutional stability, both of which are critical factors for any economy with prospects to entice international capital flows. High GDP growth rates imply rapid economic activity, which equates to higher profitability from investments, particularly in the productive corporate sector (Garg & Dua, 2014).

In addition to this, the exchange rate (REXCR) plays the role of demonstrating the expected returns that can potentially be earned on capital. An appreciation of the domestic or host country's currency means foreign investors earn even more on their initial capital outlays. Over time, the sampled countries' currencies have strengthened, hence the strong significant, positive impact of the exchange rate on FPI inflows in this study. This result conforms to Dunning and Dilyard's (1999) suggestion that the theory of FPI is located within international economics, and drawn on macroeconomic financial variables, notably interest rates and exchange fluctuations.

5.2.4 Principal components analysis

Principal components analysis (PCA) is a method used to model the structure of the variance of a set of variables. We applied it in order to generate a single composite index of financial market development, as well as infrastructural development for our sample of nine African countries. This was necessary as there has been no consensus in the literature on a single most appropriate variable to measure FMD or infrastructural development. The objective of applying principal component analysis (PCA) in this study was to develop uni-dimensional measures of financial market development, based on the identified stock market and banking sector variables, as well as for infrastructural development. This was because using the individual variables independently may not have captured and reflected the status of FMD or infrastructural development accurately and adequately for the African countries.

The principal component analysis (PCA) method enabled us to develop indices summarising information on the quality of different measures of infrastructural development based on transportation, telecommunication and energy production and use, thereby also addressing the problem of high collinearity amongst them as individual variables. Earlier studies which examined the role and influence of

infrastructure on FDI such as those by Asiedu (2002; 2006), Hsiao and Shen (2003), Anyanwu and Yaméogo (2015) used telephone lines per 1,000 people of the population to proxy infrastructural development.

PCA is achieved by computing the Eigen values of the variance matrix. According to Adnan (2011), PCA transforms data into new variables which are not correlated, while the maximum variation of the original variables is contained in the first few principal components (Jolliffe, 2002). Variables of interest are summarised by a number of mutually independent principal components, of which each principal is the weighted average of the underlying variables (Adnan, 2011). The advantage of applying PCA to construct the composite indices was that the index weights were based on the correlation of the individual measures of financial market development (stock market capitalisation, stock market total value traded, commercial bank to commercial and central bank assets, liquid liabilities of the financial system, domestic credit to the private sector by banks), as well as infrastructural development (electricity consumption, energy use, railways, air freight and telecommunications). As such, the first principal component for a set of variables is the unit length linear combination of those variables and always contains the maximum variance for any combination. If more than one principal component is generated for the variables, then they are uncorrelated.

According to Johnson and Wichtern (1992) and Huang (2005), after the first principal component, all subsequent principal components maximise the variance between the unit length linear combination and are orthogonal to the prior components, and capture different aspects of the data under consideration. Therefore, in line with the literature and for the purposes of this study, the first principal components are adopted as an aggregate measure of financial market development.

This study used PCA to determine appropriate composite indices for financial market development and infrastructural development in selected African economies using the following equation:

$$f_j = wj_1x_1 + wj_2x_2 + wj_3x_3 + \dots + wj_\rho x_\rho$$

5.17

Where,

f_j = estimate of the j th factor

w_j = weight on factor score coefficient

x_j = variable of interest

ρ = number of variables.

5.2.4.1 Financial market development index

Table 5.6 gives the eigenvalues of the correlation matrix of the five individual indicators that compose financial market development (FMD). The sum of the eigenvalues is equal to the number of individual indicators.

Table 5.6: Principal components analysis: Eigen values

Principal component	Eigenvalue	% of variance	Cumulative %
1	3.200988	64.02	64.02
2	0.860899	17.22	81.24
3	0.579228	11.58	92.82
4	0.256523	5.13	97.95
5	0.102362	2.05	100

The first principal component explains the maximum variance (64%) in all the individual indicators (eigenvalue of 3.2). The second principal component explains the maximum amount of the remaining variance (17.2%), with a variance of 0.86. The third principal component explains 11.6% of the variance, while the fourth and fifth principal components account for the remaining 7.2% of the variance. Therefore, the first two principal components are more relevant measures of FMD as they explain over 81% of the variance.

Table 5.7: Principal component analysis: Eigen vectors (loadings)

Variable	PC 1	PC 2	PC 3	PC 4	PC 5
CCBA	0.391613	-0.346200	0.825012	0.212170	0.033524
SMCAP	0.485997	-0.333202	-0.412415	0.053488	0.692702
SMTVT	0.503532	-0.213982	-0.371034	0.274535	-0.698306
PCRED	0.488210	0.258690	0.092349	-0.822363	-0.099610
LIQLI	0.344316	0.810194	0.055440	0.447742	0.146581

As noted in Table 5.7, the positive coefficients for the first principal component (PC1) imply that it represents the overall measure for financial market development. The maximum weights in PC2 and PC4 is for liquid liabilities of the financial system (LIQLI) suggesting that there is a strong influence of this variable in these components. Commercial bank to commercial bank and central bank assets has the strongest influence in PC3, while stock market capitalisation shows the largest positive weight in PC5. According to Saki (2008), if a country reflected positive values for the banking sector variables and negative ones for the stock markets under the first principal component (PC1), then we could conclude that the financial market development in that country was due to the banking sector development. In this case however, it appears that both the banking sector and stock markets were responsible for financial market development in the countries under survey, as deduced from the positive coefficients under the first principal component (PC1).

This study used PCA to determine an appropriate composite index for financial market development in selected African economies using the following specific PCA equation:

$$FMD_INDEX = 0.488210 * PCRED + 0.391613 * CCBA + 0.485997 * SMCAP + 0.503532 * SMTVT + 0.344316 * LIQLI$$

5.18

Where,

FMD_INDEX = the first principal component for financial market development

PCRED = domestic credit by banks to the private sector divided by GDP.

CCBA	= ratio of commercial bank assets divided by commercial bank plus central bank assets.
SMCAP	= stock market capitalisation as a percentage of GDP.
SMTVT	= stock market value traded as a percentage of GDP.
LIQLI	= liquid liabilities of the financial system (M3) divided by GDP.

The dynamic GMM model regression results for FDI using PCA are shown in Table 5.8.

Table 5.8: Regression Results on the Determinants of FDI in selected African economies using random effects model and Principal Components Analysis index

Variable	t-stat (std error)	Coefficient
Constant	-4.2917*** (5.4959)	-23.4220
FDIGDP(-1)	2.5141** (0.1153)	0.2898
FPIGDP	7.8320*** (0.2447)	1.9169
HUMCA	2.7297*** (1.1340)	3.0956
INFL	4.2166*** (0.0902)	0.3805
INTR	1.9605* (0.4012)	0.7865
TRDOPN	3.5725*** (0.5356)	1.9133
INSTQ	-4.5817*** (0.7596)	-3.4804
NATRES	3.5364*** (0.1243)	0.4395
RGDPG	-0.6359 (0.0851)	-0.0541
FMD_INDEX	1.7902*** (0.1119)	0.2003
AIR_FREIGHT	-4.7316*** (0.0010)	-0.0049
ELECTRIC_CONSUMPTION	2.6546*** (0.0006)	0.0017

ENERGY_USE	0.4900 (0.0014)	0.0007
RAILWAYS_TRANSPORT	1.5690* (0.0026)	0.0412
TELEPHONES_PER_1000	3.9981*** (0.0005)	0.0002

Note: FDIGDP is the ratio of foreign direct investment (FDI) to gross domestic product (GDP). FDIGDP(-1) is the first lag of FDI. FPIGDP is the ratio of foreign portfolio investment (FPI) to GDP. HUMCA is the level of education measured by the gross enrolment ratio for primary education. INFL is the percentage change in the GDP deflator. FMD_INDEX is the principal component for five variables of financial market development. INTR is the lending interest rate, adjusted for inflation by the GDP deflator. TRDOPN is the sum of imports and exports scaled by GDP. INSTQ is a measure of legal, political and economic institutional quality. NATRES is total natural resources (the sum of oil, gas, coal, forest and mineral resources) scaled by GDP. RGDPG is the real GDP growth rate. AIR_FREIGHT (the volume of freight, express, and diplomatic bags carried on each flight stage [operation of an aircraft from take-off to its next landing], measured in metric tonnes times kilometres travelled). ELECTRIC_CONSUMPTION (production of power plants and combined heat and power plants less transmission, distribution, and transformation losses and own use by heat and power plants). ENERGY_USE (use of primary energy before transformation to other end-use fuels, which is equal to indigenous production plus imports and stock changes, minus exports and fuels supplied to ships and aircraft engaged in international transport). RAILWAYS_TRANSPORT (the volume of goods transported by railway, measured in metric tonnes times kilometres travelled). TELEPHONES_PER_1000 (fixed and mobile telephone subscribers per 1000 people of the population). Standard error is in the parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1%.

With reference to Table 5.8, we re-examined all the earlier identified variables which serve as determinants of inward FDI into the sampled African countries. Initially, in Table 5.4, we regressed FDI against five individual measures of financial market development. Having found a high correlation between stock market capitalisation and stock market total value traded (see Table A5.3 below), we decided to construct a composite index to capture the five banking sector and capital market development variables and examine their effect on FDI and other explanatory variables in this study. Furthermore, we had originally applied fixed telephone lines per 1,000 people of the population as proxy for infrastructural development in Africa, in line with earlier empirical studies (see Asiedu, 2002, 2006; Anyanwu, 2012). For an in-depth analysis, we added additional variables to proxy infrastructural development. These variables were electricity consumption per capita, energy use, air freight, railway transport and telephone lines (fixed and mobile) per 1,000 people of the population, as derived from the World Bank database.

Using principal components analysis, we constructed a composite index of financial market development, and together with the five individual variables to proxy

infrastructural development, it was found that the agglomeration effect of past FDI flows on the current FDI flows remained positive but its significance reduced to 5% from the previous 1% significance level (see Table 5.4). The agglomeration effects were proxied by the first lag of the dependent variable (i.e. FDI). Our results were still in line with the findings of Anyanwu (2012), confirming the existence of a positive and highly significant between FDI and agglomeration effects in our selected African economies.

Human capital had a positive and highly significant effect on FDI when applying the composite FMD index. Another variation in the FDI determinants was seen in the individual variables of infrastructural development. The original result in Table 5.4 captured a positive and very significant effect of fixed telephone lines on inward FDI. Individually, electricity consumption, energy use, railways transport and telephone lines (fixed and mobile) all had a positive effect on the attraction of FDI, while air freight was found to have a significantly negative effect. The latter may be due to the under-development, and associated costs of using this mode of transport for industrial logistical purposes. Although most of the African countries in this study are land-locked, they do have the option to use road, rail and sea as more viable and cost-effective modes of transport.

The interest rate (INTR) was proxied using the real rate of return on capital, measured as the lending interest rate, adjusted for inflation by the GDP deflator. The interest rate reflects a risk-free return of foreign capital, and is also an indicator of the cost of capital in the domestic financial markets. Hence, the interest rate is of significance to foreign investors now, and in the future for when the need to raise additional capital locally in the host nation arises. The interest rate under FMD_INDEX was found to have a positive, 10% significance effect on FDI inflows, compared to the positive, 5% level of significance when the various FMD variables were regressed individually (see Table 5.4).

As per earlier results in Table 5.4, the real GDP growth rate (RGDPR) remained negative and insignificant, in terms of attracting FDI inflows to Africa. The finding was in line with the earlier research of Anyanwu and Yameogo (2015) who considered the real GDP growth rate to be a measure of a country's track record, serving as an

indicator to potential investors of the existence of profitable investment opportunities, as well as the attractiveness of the host country's market (Asiedu, 2013). With an array of drivers of FDI to African countries such as natural resource endowment, and a large pool of human capital, amongst others, the real GDP growth rate of such countries becomes irrelevant in FDI decisions of international investors (Addison & Heshmati, 2003).

The effect and significance of the remaining variables which explained the pattern of inward flows of FDI to the sampled African countries of Botswana, Cote d'Ivoire, Egypt, Kenya, Mauritius, Morocco, Nigeria, South Africa and Tunisia remained unchanged from the results reflected in Table 5.4. Foreign portfolio investment (FPI), inflation (INFL), trade openness (TRDOPN) and natural resource endowment (NATRES) remained positive and all had a highly significant (1%) effect on FDI inflows in the selected African economies, while institutional quality (INSTQ) remained negative but highly significant.

With regards to the financial market development composite index (FMD_INDEX), in the presence of the above-discussed explanatory variables, financial market development has a positive and highly significant effect on the attraction and retention of foreign direct investment inflows to the countries of interest in this study. This is an important result as earlier findings (see Table 5.4) that domestic credit to the private sector by banks (PCRED) and stock market value traded (SMTVT), both of which are indicators of liquidity in the banking sector and the capital markets, respectively, reflected a negative impact on inward FDI, thereby rendering FDI irrelevant. In this instance however, due to the complementarity of all five measures of different aspects of financial market development, the significance of financial market development in our sample of African economies is greatly underpinned as the banking sector and stock markets both serve as conduits for the absorption of foreign investments. We thus concluded by reaffirming the work of Soumaré and Tchana (2015) who also noted that the importance of financial market development holds true in emerging markets whose stock markets are more advanced and sophisticated than those in developing countries.

Having assessed the determinants of FDI using the individual variables, we also applied the index from the PCA to foreign portfolio investment. The random effects model for our FPI regression results are shown in Table 5.9 below.

Table 5.9: Regression results on the determinants of FPI in selected African economies using random effects model and the composite FMD index

Variable	t-stat (std error)	Coefficient
Constant	-2.0299** (2.8374)	-5.7596
FPIGDP(-1)	2.5352** (0.1569)	0.3979
FDIGDP	0.7237 (0.2713)	0.1963
REXCR	0.0197 (0.4470)	0.0088
RGDPG	-0.7707 (0.3312)	-0.2552
INFL	-1.4698 (0.3232)	-0.4750
KAOPEN	-1.0892 (0.3521)	-0.3835
FMD_INDEX	2.1297** (0.3945)	0.8401

Note: FPIGDP is the ratio of foreign portfolio investment (FPI) to GDP. FPIGDP(-1) is the lag of the dependent variable measuring agglomeration effects. FDIGDP is the ratio of foreign direct investment (FDI) to gross domestic product (GDP). REXCR is the real exchange rate. RGDPG is the real GDP growth rate. KAOPEN is Chinn and Ito's index of capital account openness. FMD_INDEX is the composite financial market development index. INFL is the percentage change in the GDP deflator. Standard error is in the parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1%.

Using the composite FMD index, the agglomeration effect (first lag of FPI) was positive and significant at 5%, thereby supporting the proposition that prospective investors do examine past trends of FPI prior to making financial commitments in foreign countries. In addition, the financial market development index itself also had a positive impact at the 5% level of significance on the attraction of FPI to the African countries under study. This in contrast to the earlier results (see Table 5.5) whereby some financial market variables such as liquidity (LIQLI) had a positive and significant effect on FPI, while stock market capitalisation (SMCAP) on its own had a negative and significant effect on inward FPI.

The application to the FPI regression of the financial market development index comprising of all five individual banking sector and stock market variables yielded better results than the standalone variables of liquid liabilities of the financial system (M3) divided by GDP (LIQLI), the ratio of commercial bank assets divided by commercial bank plus central bank assets (CCBA), domestic credit by banks to the private sector, as a percentage of GDP (PCRED), stock market capitalisation as a percentage of GDP (SMCAP) and stock market value traded as a percentage of GDP (SMTVT). Financial market development in the selected African economies of Botswana, Cote d'Ivoire, Egypt, Kenya, Mauritius, Morocco, Nigeria, South Africa and Tunisia had a positive and significant effect on foreign portfolio investment flows to those countries, thereby supporting the need to develop both the banking sector and stock markets in those economies. One financial sector alone has been proven to be inadequate to serve the needs and meet the requirements of foreign portfolio investors.

Foreign direct investment (FDI) and the real exchange rate were found to have a positive but insignificant effect on FPI inflows in the presence of the comprehensive FMD index, while the real GDP growth rate, capital account openness and the rate of inflation all had an insignificant but negative effect of FPI.

5.2.4.2 Infrastructural development index

In the case of the infrastructural development index, Table 5.10 gives the eigenvalues of the correlation matrix of the five individual indicators that compose infrastructural development in the selected African countries, as per the literature (see Sahoo, Dash & Nataraj, 2010). The sum of the eigenvalues is equal to the number of individual indicators. The five individual variables included in the infrastructural development composite index were air freight, railways transport, electricity consumption, energy use, and telephones (fixed and mobile) per 1,000 people of the population.

Table 5.10: Principal components analysis: Eigen values

Principal component	Eigenvalue	% of variance	Cumulative %
1	3.570091	71.40	71.40
2	0.968463	19.37	90.77
3	0.344462	6.89	97.66
4	0.086613	1.73	99.39
5	0.030371	0.61	100

The first principal component explains the maximum variance (71%) in all the individual indicators (eigenvalue of 3.57). The second principal component explains the maximum amount of the remaining variance (19.37%), with a variance of 0.96. The third principal component explains 6.89% of the variance, while the fourth and fifth principal components account for the remaining 2.3% of the variance. Therefore, the first two principal components are more relevant measures of infrastructural development in the sampled African economies, as they explain over 90% of the variance.

Table 5.11: Principal component analysis: Eigen vectors (loadings)

Variable	PC 1	PC 2	PC 3	PC 4	PC 5
Air	0.458961	0.132024	-0.798898	-0.357455	0.076895
Electricity	0.509199	-0.078455	0.357262	-0.325870	-0.707625
Energy use	0.498271	-0.182584	0.424665	-0.226714	0.697602
Railways	0.502590	-0.184242	-0.120750	0.833629	-0.062775
Telephones	0.170878	0.953484	0.198003	0.140350	0.052583

In Table 5.11, the positive coefficients for the first principal component (PC1) imply that it represents the overall infrastructural development measure for the African countries. The maximum weight in PC2 is for fixed and mobile telephone lines suggesting that there is a strong influence of this variable in these components. In PC3, energy use makes the largest contribution, while railways has the strongest influence in PC4, and energy use shows the largest positive weight in PC5. Air

transport does not feature prominently in any of the principal components due to it being largely underdeveloped and a more expensive option of transporting goods in the sampled African countries. The infrastructural development variables were a combination of transport, communication and electricity variables, all of which play a significant role in the productivity of FDI. Based on the positive coefficients under the first principal component (PC1), electricity, railways and energy were the most influential variables insofar as the attraction and retention of FDI to Africa is concerned, based on the degree of infrastructural development.

Thus, having evaluated the determinants of FDI using the individual variables, as well as the composite index of financial market development, we further assessed the FDI determinants using the infrastructural development index from the PCA. This study used PCA to establish an appropriate composite index infrastructural development in selected African economies using the following specific equation:

$$\begin{aligned} \text{INFRAS_INDEX} = & 0.458961 * \text{AIR_FREIGHT_} + 0.509199 * \text{ELECTRIC_CONSUMPTION_} \\ & 0.498271 * \text{ENERGY_USE} + 0.502590 * \text{RAILWAYS_TRANSPORT} + 0.170878 * \\ & \text{TELEPHONES_PER_1000} \end{aligned}$$

5.19

Where,

INFRAS_INDEX = the first principal component for infrastructural development based on the five individual variables for air, railways, electricity, energy and telephones.

AIR_FREIGHT= the volume of freight, express, and diplomatic bags carried on each flight stage (operation of an aircraft from take-off to its next landing, measured in metric tonnes times kilometres travelled).

ELECTRIC_CONSUMPTION = production of power plants and combined heat and power plants less transmission, distribution, and transformation losses and own use by heat and power plants, measured in kwh per capita.

ENERGY_USE = use of primary energy before transformation to other end-use fuels, which is equal to indigenous production plus imports and stock changes, minus exports and fuels supplied to ships and aircraft engaged in international transport.

RAILWAYS_TRANSPORT = the volume of goods transported by railway, measured in metric tonnes times kilometres travelled.

TELEPHONES_PER_1000 = fixed and mobile telephone subscribers per 1000 people of the population.

The dynamic GMM model regression results for FDI determinants using the composite infrastructural development index are shown in Table 5.12.

Table 5.12: Regression results on the determinants of FDI in selected African economies using random effects model and infrastructural development index

Variable	t-stat (std error)	Coefficient
Constant	-5.7170*** (9.6178)	-54.9851
FDIGDP(-1)	3.7491*** (0.1375)	0.5156
FPIGDP	8.3382*** (0.2936)	2.4484
HUMCA	2.0920** (1.2279)	2.5687
INFL	4.1291*** (0.1005)	0.4149
INTR	1.9605*** (0.4012)	1.2188
TRDOPN	4.3158*** (0.6459)	2.7876
INSTQ	-5.4775*** (1.0787)	-5.9088
NATRES	5.1005*** (0.1716)	0.8735
RGDPG	-2.6848*** (0.1097)	-0.2945
INFRAS_INDEX	3.6861*** (0.0003)	0.0009
CCBA	4.9141*** (1.0591)	5.2047
SMCAP	3.3505*** (0.2664)	0.8927
SMTVT	-3.3958*** (0.1608)	-0.5461
PCRED	-3.2768*** (0.4673)	-1.5312
LIQLI	3.7373*** (0.5528)	2.0661

Note: FDIGDP is the ratio FDI to GDP. FDIGDP(-1) is the first lag of FDI. CCBA is the ratio of commercial bank assets divided by commercial bank plus central bank assets. FPIGDP is the ratio of FPI to GDP. HUMCA is the level of education measured by the gross enrolment ratio for primary education. INFL is the percentage change in the GDP deflator. RGDPG is the real GDP growth rate. INFRAS_INDEX is the principal component for five variables of infrastructural development. INTR is the lending interest rate, adjusted for inflation by the GDP deflator. PCRED is domestic credit by banks to the private sector, scaled by GDP. SMCAP is stock market capitalisation as a % of GDP. SMTVT is the stock market value traded as a % of GDP. LIQLI is the liquid liabilities of the financial system (M3) divided by GDP. TRDOPN is the sum of imports and exports scaled by GDP. INSTQ is a measure of legal, political and economic institutional quality. NATRES is total natural resources scaled by GDP. Standard error is in the parentheses. Instrument rank: 17; j-statistic: 12.4; prob(j-stat): 0.27. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 5.12 reflects the results of FDI determinants as regressed against the individual explanatory variables, as well as the infrastructural development composite index. The interest rate (INTR) continued to have a positive effect and also improved in terms of its significance on FDI flows to our sampled African countries from 5% to 1%. Moreover, real GDP growth rate (RGDPG), which remained as bearing a negative effect on inward FDI flows, rose from a 10% level of significance to a 1% level of significance.

The composite index of infrastructural development was also found to have a positive and highly significant effect on FDI flows to the selected African countries. The application of the composite index for infrastructure resulted in no further changes in terms of effect and significance to any of the other explanatory variables as initially captured in Table 5.4.

Thus, in the presence of a composite infrastructural development index, the determinants of foreign direct investment flows to Botswana, Cote d'Ivoire, Egypt, Kenya, Mauritius, Morocco, Nigeria, South Africa and Tunisia remained the same as when initially tested using the fixed telephone lines per 1,000 people of the population as the original proxy for infrastructural development. This implies that the proxy adopted to measure infrastructural development in African economies can be a simplistic one such as fixed telephone lines or a more comprehensive index such as the one used after principal components analysis in this study. However, the overall impact remains largely unchanged due to the presence of stronger explanatory variables.

5.2.4.3 FDI determinants based on principal components analysis composite indices of financial market development and infrastructural development

In order to complete the analysis of FDI determinants, we regressed the composite indices of financial market development and infrastructural development together with all the earlier identified explanatory variables. The results are presented in Table 5.13.

Table 5.13: Determinants of FDI in selected African economies using financial market development and infrastructural development indices

Variable	t-stat (std error)	Coefficient
Constant	-2.5699** (4.9952)	-12.8374
FDIGDP(-1)	1.1812 (0.1131)	0.1336
FPIGDP	7.2911*** (0.2092)	1.5255
HUMCA	0.7949 (1.0338)	0.8217
INFL	4.0719*** (0.0969)	0.3947
INTR	1.0438 (0.3593)	0.3751
TRDOPN	3.1983*** (0.3593)	1.7018
INSTQ	-3.7647*** (0.7902)	-2.9749
NATRES	3.6373*** (0.1108)	0.4030
RGDPG	-0.1384 (0.0935)	-0.0129
FMD_INDEX	2.0695** (0.0985)	0.2038
INFRAS_INDEX	4.7705*** (0.0002)	0.0009

Note: FDIGDP is the ratio of foreign direct investment (FDI) to gross domestic product (GDP). FDIGDP(-1) is the first lag of FDI. FPIGDP is the ratio of foreign portfolio investment (FPI) to GDP. HUMCA is the level of education measured by the gross enrolment ratio for primary education. INFL is the percentage change in the GDP deflator. FMD_INDEX is the principal component for five variables of financial market development. INFRAS_INDEX is the principal component for infrastructural development. INTR is the lending interest rate, adjusted for inflation by the GDP deflator. TRDOPN is the sum of imports and exports scaled by GDP. INSTQ is a measure of legal, political and economic institutional quality. NATRES is total natural resources (the sum of oil, gas, coal, forest and mineral resources) scaled by GDP. Standard error is in the parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1%.

A combination of the composite indices of financial market development and infrastructural development affirmed the more dominant and significant determinants of FDI to the sampled African economies. The agglomeration effects (FDIGDP[-1]), human capital (INFL) and interest rate (INTR) remained positive but became insignificant, while real GDP growth rate (RGDPG) was negative and insignificant. Therefore, the economies of Botswana, Cote d'Ivoire, Egypt, Kenya, Mauritius, Morocco, Nigeria, South Africa and Tunisia benefitted from the presence of developed financial markets and infrastructure, in their quest to attract and retain foreign direct inflows.

5.2.5 Unit root and serial correlation tests

Stationarity tests were conducted to determine the order of integration of our variables, for the purposes cointegration tests and regression analyses. Although the selected cointegration testing approach did not require the pre-testing of variables (Ghartey, 2015), the unit root tests provided guidance as to whether ARDL was appropriate or not, since the ARDL methodology is only applicable for the analysis of variables that are integrated of order zero $I(0)$ or order one $I(1)$ (Nyasha and Odhiambo, 2015). So, unit root tests and ARDL were complementary to each other.

Although there are many various unit root tests available, the choice of which test to apply was dependent solely on the size and power of the unit root tests (Granger & Porter, 2009). Size in this instance refers to the level of significance, while power implies the probability of rejecting the null hypothesis, when it is false. Power is more sensitive to the time span of the data, more than the sample size. Maddala and Wu (1999) argued that using panel data unit root tests is one way of increasing the power of unit root tests based on a single time series.

The panel data of the three key variables, namely foreign direct investment (FDI), foreign portfolio investment (FPI) and financial market development (FMD) (both individual variables and the composite FMD index) were tested for stationarity using the Augmented Dickey-Fuller (ADF), Phillips-Perron (PP), Levin, Lin and Chu (LLC) and Im, Pesaran and Shin (IPS) tests, prior to testing for cointegration using the ARDL bounds approach and the VECM. The lag structure was determined using the automatic Akaike Information Criterion (AIC). The null hypothesis under all the tests

was that each series in the panel contained a unit root. The results of the stationarity tests are presented in Table 5.14.

Table 5.14: Stationarity tests of variables using ADF, PP, LLC and IPS unit root

Variable	No trend	Intercept and Trend	Intercept	Diagnosis
Stationary tests of variables using – Augmented Dickey Fuller (ADF) test				
FDI: @level	-3.7666***	-2.2813**	-2.8607***	I(0)
FPI	-8.2696***	-6.3351***	-9.0191***	I(1)
FMD: SMCAP	-12.9008***	-7.6729***	-9.5882***	I(1)
FMD: SMTVT	-12.7151***	-7.5518***	-9.2465***	I(1)
FMD: LIQLI	-12.1619***	-8.5086***	-11.4710***	I(1)
FMD: PCRED	-9.4368***	-7.4152***	-9.6475***	I(1)
FMD: CCBA	-13.0343***	-8.3787***	-9.3854***	I(1)
FMD_INDEX	-10.5957***	-7.8784***	-9.7937***	I(1)
Stationary tests of variables using Phillips-Perron (PP) test				
FDI: @level	-5.0904***	-3.8757***	-4.0886***	I(0)
FPI	-15.2419***	-18.6265***	-15.0088***	I(1)
FMD: SMCAP	-13.7830***	-9.6784***	-11.0340***	I(1)
FMD: SMTVT	-13.7925***	-10.7012***	-12.1247***	I(1)
FMD: LIQLI	13.5171***	-10.3430***	-11.1703***	I(1)
FMD: PCRED	-14.3495***	-11.1987***	-11.8563***	I(1)
FMD: CCBA	-20.0431***	-20.3100***	-12.9169***	I(1)
FMD_INDEX	-12.2680***	-9.2246***	-10.7483***	I(1)
Stationary tests of variables using Levin, Lin and Chu (LLC) test				
FDI: @level	-4.5932***	-2.3625***	-2.9548***	I(0)
FPI	-8.3980***	169.863	105.769	I(1)
FMD: SMCAP	-14.3732***	-8.0977***	-10.6736***	I(1)
FMD: SMTVT	-14.8415***	-9.2882***	-11.0415***	I(1)
FMD: LIQLI	-14.4347***	-11.0970***	-14.7129***	I(1)
FMD: PCRED	-11.2699***	-2.0325**	-6.3600***	I(1)
FMD: CCBA	-15.4599***	-2.5553***	-6.2677***	I(1)
FMD_INDEX	-12.6802***	-8.2725***	-11.2729***	I(1)
Stationary tests of variables using Im, Pesaran and Shin (IPS) test				
FDI: @level	-	-2.3503***	-2.8657***	I(0)
FPI	-	-2.4970***	-5.9627***	I(1)
FMD: SMCAP	-	-8.6598***	-10.9272***	I(1)
FMD: SMTVT	-	-8.7445***	-10.4537***	I(1)
FMD: LIQLI	-	-10.0448***	-13.6128***	I(1)
FMD: PCRED	-	-8.4362***	-11.2227***	I(1)
FMD: CCBA	-	-10.0465***	-11.2133***	I(1)
FMD_INDEX	-	-8.6943***	-10.9327***	I(1)

All tests at first difference (except where indicated otherwise.)

All test probabilities are computed assuming asymptotic normality.

***, **, * indicates that we reject the null hypothesis of unit root tests at 1%, 5% and 10%, respectively.

Table 5.14 captures the unit root tests using the ADF, PP, LLC and IPS methods. The ADF, PP and IPS were individual root tests, while the LLC was a common root test which was deemed appropriate for panel data. All the tests were done in EViews using the AIC automatic lag length selection, the Bartlett kernel selection criteria and the Newey-West automatic bandwidth selection.

In terms of the possible deterministic components, the first column in Table 5.14 reflects the no effect (no trend) unit roots, while column 2 is for unit root tests with the individual effect (intercept) and trend, and column 3 shows the unit root test results in individual effect (intercept only). Column 4 summarises the order of integration based on the unit root test results under each method.

As can be assessed in Table 5.14, the series examined were either $I(0)$ or $I(1)$, depending on the unit root test applied. The evidence indicated that only one variable (FDIGDP) became stationary at level, and was statistically significant at 1%. The FPIGDP, financial market development index (FMD_INDEX), and the other individual FMD variables (SMCAP, SMTVT, LIQLI, PCRED and CCBA) were stationary in first difference, and statistically significant also at one percent. The FPIGDP variable under the LLC test was however found to have no unit root only under the no trend scenario. The unit root test findings for the key FDI and FMD variables in the study pertaining to the sampled African countries were in line with earlier empirical studies conducted by Otchere *et al.* (2015).

5.3 ARDL cointegration tests

Two variables are considered to be cointegrated if they have a long-term or equilibrium relationship between them (Awe, 2012). Cointegration therefore implies that despite being individually non-stationary, a linear combination of two or more time series can be stationary. According to Granger (1986), a cointegration test is a pre-test to detect and avoid spurious regression situations.

For the purposes of this study, we applied the autoregressive distributed lag (ARDL) bounds testing approach to cointegration, a method developed by Pesaran, Shin and Smith (2001), as the sample size was only approximately thirty-five years. According

to Abdul and Biekpe (2016), the short-time period justifies the use of ARDL bounds testing of Pesaran *et al.* (2001) over other cointegration procedures such as that of Johansen and Juselius (1990) and Engle and Granger (1987). According to Odhiambo (2014), the UECM Bounds Test using autoregressive distributed lags (ARDL), assumes only one cointegration relationship in the model, and is only applied when regressors are either integrated in the $I(0)$ or $I(1)$. However, an important condition is that none of the variables is integrated $I(2)$.

Although it has already been noted that it is not important to test for stationarity in the ARDL framework, we used the Augmented Dickey-Fuller (ADF), the Phillips-Perron (PP), Levin, Lin and Chu (LLC) and Im, Pesaran and Shin (IPS) unit root tests to assess for stationarity and to check whether the variables are not integrated of order two [$I(2)$] (see Table 5.14 for unit root test results). None of the variables were integrated $I(2)$.

Having assessed the stationarity properties of the variables, we then proceeded to conduct a preliminary determination of the optimal lag lengths using the various criteria of the general-to-specific sequential Likelihood Ratio test (LR), the Final Prediction Error (FPE), the Akaike Information Criterion (AIC), Schwarz Information Criterion (SC), and the Hannan-Quinn Criterion (HQ).

DeSerres and Guay (1995) examined lag length selection in the context of vector autoregression (VAR) and vector error correction models (VECM) with long-run restrictions. Their comparison of four different lag selection criteria revealed that the Schwarz information criterion (SIC) systematically underperforms relative to other tests. DeSerres and Guay (1995) emphasised that to avoid biases, sequence-based tests tended to produce more reliable results than the information-based, as the order of the VAR that best approximates the data-generating process increases.

As such, our ARDL methodology required the determination of the order of lags on the first differenced variables, hence an estimation of an equation in ordinary least squares (OLS). The results provided multiple outputs including the Durbin-Watson (DW) test statistic, which was used to check the variables for serial correlation; as well as three forms of lag length criteria (AIC, SC and HQ). The DW statistic detects autocorrelation.

DW statistics can range from 0 to 4, although only values less than 1.5 or greater than 2.5 suggest that autocorrelation may exist in the regression (Vasigh, Tacker & Fleming, 2008). The results in Table 5.15 fall within the acceptable range of the DW statistic, indicating that no first order serial correlation exists in the regressions.

Based on the optimal lag length results, it was determined using AIC, SC and HQ lag structure criteria that the appropriate optimal lag length for the variables was 3 lags for FDI, 4 lags for FPI and 1 lag for all individual FMD variables (SMCAP, SMTVT, CCBA, PCRED, LIQLI). However, when factoring in the composite FMD index, the optimal lag lengths became 1 and 2 for FDI and FPI, respectively, while the FMD composite index lag length remained at 1.

Table 5.15: Optimal lag lengths

	AIC	SC	HQ	Serial Correlation Durbin-Watson
FDI (FPI SMCAP) 3 lags	2.87	3.16	2.99	2.02
FDI (FPI SMTVT) 3 lags	2.87	3.16	2.99	1.97
FDI (FPI CCBA) 3 lags	2.91	3.19	3.02	1.95
FDI (FPI PCRED) 3 lags	2.88	3.16	2.99	1.96
FDI (FPI LIQLI) 3 lags	2.90	3.18	3.02	1.94
FDI (FPI FMD_INDEX) 1 lag	2.75	2.88	2.80	1.98
FPI (FDI SMCAP) 4 lags	3.27	3.68	3.44	1.98
FPI (FDI SMTVT) 4 lags	3.28	3.68	3.44	1.99
FPI(FDI PCRED) 4 lags	3.33	3.73	3.49	2.02
FPI(FDI CCBA) 4 lags	3.34	3.75	3.51	1.97
FPI (FDI LIQLI) 4 lags	3.33	3.74	3.50	1.98
FPI (FDI, FMD_INDEX 2 lags	3.04	3.26	3.13	1.98
SMCAP (FDI FPI) 1 lag	0.40	0.53	0.45	2.01
SMTVT (FDI FPI) 1 lag	1.84	1.97	1.89	1.99
PCRED (FDI FPI) 1 lag	5.29	5.61	5.42	1.73

CCBA (FDI FPI) 1 lag	4.39	4.71	4.52	2.06
LIQLI (FDI FPI) 1 lag	4.84	5.17	4.98	2.09
FMD_INDEX (FDI FPI)	1.19	1.31	1.24	2.02

Source: Author's computations. Maximum lags as indicated.

Thereafter, we used the Wald test to examine the significance of the lagged coefficients. The Wald test F-statistic was subjected to bounds testing using Table CI(iii) Case III Unrestricted intercept and no trend as given by Pesaran, Shin and Smith (2001:300). For all the equations, the null hypothesis was that there was no cointegrating/ long-run relationship between the key dependent variables of FDI, FPI and FMD, respectively. If one rejected the null hypothesis that the coefficients are jointly equal to zero, then one could conclude the existence of long-run relationships.

In order to investigate the relationships between FDI, FPI and FMD variables, respectively, the models below were specified and estimated using the ARDL bounds testing approach. The ARDL methodology, which is based on the estimation of an unrestricted error correction model (UECM), uses both lagged (to estimate the long run model) and differenced (used to estimate the short run model) variables. On the other hand, the VECM (modelled in the next section) assumes that all variables in the model are endogenous, uses vector auto regression (VAR), and is applicable in situations where there is more than one cointegrating relationship in the model. The VECM can be considered to be a restricted VAR model (Pesaran *et al.*, 2001).

Models using the ARDL Bounds Testing approach, consisting of an unrestricted error correction model (UECM) are specified as follows:

$$\begin{aligned}
\Delta FDI_{it} = & \delta_0 + \delta_1 FDI_{it-1} + \delta_2 FPI_{it-1} + \delta_3 FMD_{it-1} + \sum_{i=0}^m \delta_{1i} \Delta FDI_{it-1} \\
& + \sum_{i=0}^m \delta_{2i} \Delta FPI_{it-1} + \sum_{i=0}^m \delta_{3i} \Delta FMD_{it-1} + \varepsilon_{it}
\end{aligned}
\tag{5.20}$$

$$\begin{aligned}\Delta FPI_{it} = & \delta_0 + \delta_1 FPI_{it-1} + \delta_2 FDI_{it-1} + \delta_3 FMD_{it-1} + \sum_{i=0}^m \delta_{1i} \Delta FPI_{it-1} \\ & + \sum_{i=0}^m \delta_{2i} \Delta FDI_{it-1} + \sum_{i=0}^m \delta_{3i} \Delta FMD_{it-1} + \varepsilon_{it}\end{aligned}\quad (5.21)$$

$$\begin{aligned}\Delta FMD_{it} = & \delta_0 + \delta_1 FMD_{it-1} + \delta_2 FDI_{it-1} + \delta_3 FPI_{it-1} + \sum_{i=0}^m \delta_{1i} \Delta FMD_{it-1} \\ & + \sum_{i=0}^m \delta_{2i} \Delta FDI_{it-1} + \sum_{i=0}^m \delta_{3i} \Delta FPI_{it-1} + \varepsilon_{it}\end{aligned}\quad (5.22)$$

Where, Δ represents the first difference operator. FDI_{it} , FPI_{it} and FMD_{it} are the respective dependent variables (FDI = inflow of foreign direct investment as percentage of GDP; FPI = foreign portfolio investment inflows as a percentage of GDP), for country i at time t . FMD_{it} is proxied by different measures of financial market development (SMCAP, SMTVT, CCBA, LIQLI, PCRED). ε_{it} is a random error term.

When comparing the estimated F-statistics from the Wald tests to the asymptotic critical value bounds from Pesaran *et al.* (2001), if the computed f-statistic fell below the lower bound, if the variables are $I(0)$, so no cointegration exists. However, if the f-statistic exceeded the upper bound $I(1)$, then a cointegrating/ long-run relationship existed. If the F-statistic was between the lower and upper bound values, then the test of level relationship was inconclusive. The values of our F-statistics are captured in Table 5.16.

Table 5.16: Bounds test results

Dependent variable	Function	F-test statistic
FDI	FDI(FPI, SMCAP)	4.8844***
	FDI(FPI, SMTVT)	4.1795***
	FDI(FPI, CCBA)	3.4864**
	FDI(FPI, PCRED)	4.2064***
	FDI(FPI, LIQLI)	3.6125**
	FDI(FPI, FMD_INDEX)	6.6910***
FPI	FPI(FDI, SMCAP)	2.5261*
	FPI(FDI, SMTVT)	2.2836*
	FPI(FDI, CCBA)	1.3991
	FPI(FDI, PCRED)	1.5406
	FPI(FDI, LIQLI)	1.3362
	FPI(FDI, FMD_INDEX)	4.3131***
FMD: SMCAP	SMCAP(FDI, FPI)	1.8260
FMD: SMTVT	SMTVT(FDI, FPI)	0.6713
FMD: CCBA	CCBA(FDI, FPI)	2.4309*
FMD: PCRED	PCRED(FDI, FPI)	0.7992
FMD: LIQLI	LIQLI(FDI, FPI)	0.4318
FMD_INDEX	FMD_INDEX(FDI, FPI)	0.5725

Source: Author's own computations. *, **, *** denotes significance at 10%, 5%, and 1%, respectively.

There is $(k+1) = 3$ variables (FDI, FPI and individual values of FMD variables) in the model. However, when checking the bounds test tables of critical values, there is $k = 2$. Table CI (iii) of the Pesaran *et al.* (2001:300) study was the relevant table to use here as we did not constrain the intercept of our model, and there was no linear trend term included. The lower and upper bounds for our k (which is the number of variables [3] minus 1=2) for the F-test statistic at the 10%, 5%, and 1% significance levels were [3.17 4.14], [3.79 4.85] and [5.15 6.36], respectively.

The null hypothesis for all the equations was that there was no cointegrating/ long-run relationship between the key dependent variables of FDI, FPI and FMD (index and individual variables), respectively. If one rejected the null hypothesis that the

coefficients are jointly equal to zero, then one could conclude the existence of long-run relationships.

The results in Table 5.16 show that when FDI was the dependent variable, there was evidence of long-run relationships between FDI, FPI and the individual financial market variable of SMCAP at 5%; and FDI, FPI and individual financial market variables of SMTVT and PCRED at 10%, respectively. We also determined a cointegrating relationship between FDI and the composite financial market development index (FMD_INDEX) at the 1% level of significance. In the case of the existence of long-run relationships between FDI, FPI and the individual financial market variables of CCBA and LIQLI, the test evidence was inconclusive at the 10% level of significance.

Ceteris paribus, there was certainty that FDI inflows to the selected African countries were influenced by previous levels of FDI, FPI and only specific individual variables of FMD (SMCAP, SMTVT, PCRED), respectively. Further, as a collective, the five individual financial market variables when incorporated into the composite financial market development index, had a significant (1% level of significance) impact on inward FDI flows to the economies of Botswana, Cote d'Ivoire, Egypt, Kenya, Mauritius, Morocco, Nigeria, South Africa and Tunisia. In all instances of FDI, since the value of the F-statistic was above the upper bound at the 10% significance level (or higher); there was evidence of a long-run relationship between all the FDI, FPI, composite and individual FMD time-series at this level of significance or greater.

Using the same results in Table 5.16, when FPI was the dependent variable, there was no evidence of long-run relationships between FPI, FDI and individual financial market variables (SMCAP, SMTVT, PCRED, CCBA, LIQLI). The composite financial market development index test results were inconclusive as the F-statistic fell between the lower and upper bound at the 5% level of significance. In all other instances of FPI, since the value of the F-statistic was below the lower bound at the 10% significance level (or higher), it was also concluded that there was no evidence of a long-run relationship between the three time-series at this level of significance or greater. Nonetheless, FPI inflows to the selected African countries in the long run were influenced only by the composite FMD index, but not previous levels of FDI, FPI, nor

any of the individual variables of FMD (SMCAP, SMTVT, PCRED, CCBA, LIQLI), respectively.

It is possible that in the long run, other variables such as the real GDP growth rate, institutional quality and even the real exchange rate affect the volumes and trends of inward FDI and FPI to our sampled countries. However, we did not test for these possible alternative relationships as they fall outside the scope of this study.

With regards to the financial market development (FMD) index and individual variables being the dependent variable, there was no evidence of long-run relationships between FDI, FPI, the composite FMD index and any of the financial market variables (SMCAP, SMTVT, PCRED, CCBA, LIQLI). In respect of the composite index and all individual cases of FMD, since the value of the F-statistic was below the lower bound at the 10% significance level (or higher), it was concluded that there exists no evidence of a long-run relationship between the three time-series at this level of significance or greater, when FMD was the dependent variable. Thus, in the long run, none of the individual FMD variables nor the composite FMD index in the selected African countries were influenced by past FDI or FPI inflows, respectively.

5.3.1 Vector error correction model (VECM)

Similar to Hajilee and Al Nasser's (2015) study, we advanced the argument that both the banking sector and the stock market might have long-run and short-run effects on FDI and FPI in the selected African countries. Both the long-run and short-run effects had to be empirically ascertained, as testing only the long-run relationship would lead to incorrect conclusions about the relationships between FDI, FPI and FMD.

As such, the short-run dynamics were analysed by estimating vector error correction models specified as:

$$\begin{aligned} \Delta FDI_{it} = & \delta_{0i} + \sum_{i=0}^m \delta_{1i} \Delta FDI_{it-1} + \sum_{i=0}^l \delta_{2i} \Delta FPI_{it-1} + \sum_{i=0}^l \delta_{3i} \Delta FMD_{it-1} \\ & + \delta_{4i} ECT_{it-1} + \varepsilon_{it} \end{aligned} \tag{5.23}$$

$$\Delta FPI_{it} = \phi_{0i} + \sum_{i=0}^m \phi_{1i} \Delta FPI_{it-1} + \sum_{i=0}^l \phi_{2i} \Delta FDI_{it-1} + \sum_{i=0}^l \phi_{3i} \Delta FMD_{it-1} + \phi_{4i} ECT_{it-1} + \varepsilon_{it} \quad (5.24)$$

$$\Delta FMD_{it} = \lambda_{0i} + \sum_{i=0}^m \lambda_{1i} \Delta FMD_{it-1} + \sum_{i=0}^l \lambda_{2i} \Delta FDI_{it-1} + \sum_{i=0}^l \lambda_{3i} \Delta FPI_{it-1} + \lambda_{4i} ECT_{it-1} + \varepsilon_{it} \quad (5.25)$$

Where, ECT is the error correction term obtained from the cointegration relationships, while its coefficients (δ , ϕ , and λ) represent the speed of adjustment to long-run equilibrium. ε_t is the white noise error term and all the other variables are as previously defined. Results of the Vector Error Correction Models are in given Table 5.17 below.

Table 5.17: VECM results

Dependent variable	Independent variable	ECT(-1)
FDI	FPI; SMCAP	-0.2285***
FDI	FPI; SMTVT	-0.2370***
FDI	FPI; PCRED	-0.2194**
FDI	FPI; CCBA	-0.2343***
FDI	FPI; LIQLI	-0.2421***
FDI	FPI, FMD_INDEX	-0.8899***
FPI	FDI; SMCAP	-0.1426**
FPI	FDI; SMTVT	-0.1325**
FPI	FDI; PCRED	-0.1307*
FPI	FDI; CCBA	-0.1251*
FPI	FDI; LIQLI	-0.1242*
FPI	FDI, FMD_INDEX	-0.4098
SMCAP	FDI; FPI	-0.0457**
SMTVT	FDI; FPI	-0.0341
PCRED	FDI; FPI	-0.0204

CCBA	FDI; FPI	-0.0450**
LIQLI	FDI; FPI	-0.0137
FMD_INDEX	FDI, FPI	-0.1174

Source: Author's own computations. *, **, *** denotes significance at 10%, 5%, and 1%, respectively.

According to Gujarati and Porter (2009), Engle and Granger's error correction mechanism is a means of reconciling the short-run behaviour of an economic variable with its long-term trends. Theoretically, the error correction term (ECT) should fall between 0 and -1. A positive sign of the ECT indicates the presence of autocorrelation, and also that due to any structural changes in the variables under study, the time series will diverge from equilibrium (instead of converging). None of the variables in this particular study gave a positive resultant ECT.

The results of ECM indicate that there was both short- and long-run equilibrium within the system. When FDI was interacted with FPI and SMCAP, the error correction term was -0.2285, and significant at 1%. This shows that the system corrected its previous period disequilibrium at a speed of approximately 22.85% annually to reach the steady state. The same analysis applied to FDI's interaction with FPI and the FMD variables of SMTVT, CCBA and LIQLI, where the results gave evidence of statistically highly significant ECTs (significant at 1%). Only the interaction between FDI and PCRED was -0.2194, and significant at 5%. In this instance, 21.94% of the disequilibrium in the series was corrected within a year (as our data was on an annual basis). In the case of FDI's interaction with the composite FMD index, the ECT was -0.8899, and significant at 1% implying that the system corrected its previous period disequilibrium at a speed of approximately 88.99% annually to reach the steady state.

Insofar as FPI is concerned, the time series was significant at 5% only when it was interacted with FDI and individual FMD variables of SMCAP and SMTVT. The error correction terms were -0.1426 and 0.1325, respectively. This demonstrates that approximately 14.26% and 13.25% of the disequilibrium in the series were corrected within a year. The results of FPI's interaction with the banking sector variables of PCRED, CCBA and LIQLI were negative and significantly weak. FPI's interaction with the composite FMD index was insignificant and negative at -0.4098.

For the individual financial market variables, only SMCAP and CCBA were statistically significant in their interaction with FDI and FPI inflows. The 4.57% and 4.50% disequilibria between those time series could be corrected within a year, respectively. In the case where the ECT was negative but not significant, it would effectively correct the model in the long run, although the time series do converge. This also applied to the FMD index as well as the individual variables of SMTVT, PCRED and LIQLI when interacted with both FDI and FPI variables, respectively.

5.4 Granger causality testing between FDI, FPI and FMD

In order to empirically test for causality in this study, we employed the Granger causality test. Granger causality is the presumption that knowledge of past values of one variable (X) help to improve the forecasts of another variable (Y). Hence, if variable X (Granger) causes variable Y, then changes in X should precede changes in Y. Past events (X) cannot be influenced by future events (Y) (Kar, Nazlıoğlu & Ağır, 2011).

Having obtained results of the unit root and cointegration tests, we proceeded to run the actual Granger causality tests between the FDI, FPI and FMD variables using the optimal lag lengths. In Granger causality testing, there are three possible outcomes:

1. Uni-directional causality from any of the variables to the other(s);
2. Bi-directional Granger causality, which by default would imply complementarity;
and
3. The absence of causality between our variables.

We considered the following standard specification for testing Granger causality between the variables, observed on T years and N individual subjects (Granger & Porter, 2009; Hurlin, 2004).

$$y_{it} = \alpha_i + \sum_{k=1}^p \gamma^k y_{it-k} + \sum_{k=1}^p \beta_i^k x_{it} + \varepsilon_{it} \quad (5.26)$$

Where, x and y are two stationary variables, i is the country, k is the time lag, parameter ε_{it} are i.i.d $(0, \sigma_\varepsilon^2)$, p is the number of lags and $t \in [I, T]$. The basic assumption is that the relationship between x and y holds for at least one subset of variables in the sample. Consistent with Hurlin and Venet (2001), one can assume that γ^k are identical for all individuals, and that the regression coefficients β_i^k may have an individual dimension.

More specifically, we also considered the following models for testing Granger causality between the FDI, FPI and FMD variables:

$$FDI_{it} = \alpha_i + \sum_{k=1}^p \gamma^k FDI_{it-k} + \sum_{k=1}^p \beta_i^k FPI_{it} + \sum_{k=1}^p \beta_i^k FMD_{it} + \varepsilon_{it} \quad (5.27)$$

$$FPI_{it} = \alpha_i + \sum_{k=1}^p \gamma^k FPI_{it-k} + \sum_{k=1}^p \beta_i^k FDI_{it} + \sum_{k=1}^p \beta_i^k FMD_{it} + \varepsilon_{it} \quad (5.28)$$

$$FMD_{it} = \alpha_i + \sum_{k=1}^p \gamma^k FMD_{it-k} + \sum_{k=1}^p \beta_i^k FDI_{it} + \sum_{k=1}^p \beta_i^k FPI_{it} + \varepsilon_{it} \quad (5.29)$$

The results of the Granger causality tests are presented in Table 5.18 below. A rejection of the null hypothesis implied a causal relationship between the pairwise variables being examined.

Table 5.18: Granger causality Wald test results for our dynamic GMM data

Variable X	Variable Y	Chi-square test	P-value
Direction of causal flow			
			
FDI	FPI	4.3908**	0.0361
FPI	FDI	17.9789**	0.0121
FDI	SMCAP	12.2481**	0.0156
SMCAP	FDI	2.6996	0.6093
FDI	SMTVT	3.4970	0.4783
SMTVT	FDI	3.9417	0.4140
FDI	PCRED	6.8828*	0.0757
PCRED	FDI	2.9236	0.5707
FDI	CCBA	4.8415	0.3039
CCBA	FDI	0.4731	0.4916
FDI	LIQLI	1.5928	0.8155
LIQLI	FDI	1.1747	0.8822
FDI	FMD_INDEX	23.4812***	0.0000
FMD_INDEX	FDI	0.6331	0.4262
FPI	FMD_INDEX	0.7823*	0.0764
FMD INDEX	FPI	0.9595***	0.0026
No. of obs:	Max: 185	Min: 120	
D.f.:	1	4	

Source: Author's own computations. *, **, *** denotes significance at 10%, 5% and 1%, respectively.

From the results above, there were only seven causal relationships existing among the variables of interest in this study. Of these, three were found to be uni-directional. Of the possible cases, we rejected the null hypothesis of no causality from FDI to FPI under all conditions of FMD at the 5% level of significance (SMTVT, PCRED), and at the 10% level of significance in the case of SMCAP, CCBA and LIQLI. Similarly, we rejected the null hypothesis of no causality from FPI to FDI under all conditions of individual FMD indicators at the 5% level of significance. Thus, one can conclude that in the presence of individual financial market development variables, there was bi-

directional causality between FDI and FPI, thereby confirming complementarity between the two international capital flows. We also established the existence of bi-directional causality between FPI and the composite FMD index, again implying complementarity. FPI inflows are directed at the stock markets, hence this result was expected.

The findings that FDI and FPI are complementary in nature were in line with the theory of Pfeffer (2008), who modelled the relationship between FDI and FPI. She found that firms often pursue international diversification through combined investment strategies (FDI and FPI together, as opposed to FDI only or FPI only), hence making FDI and FPI complementary in nature. More recently, an empirical study by Noman *et al.* (2015) also confirmed the complementarity between FPI and FDI flows, when they reached two major conclusions: a positive and complementary relationship exists between FPI and FDI; and the impact of FPI on FDI was greater than the impact of FDI on FPI at an aggregate level across national borders. Empirically, Xue-jun Kang (2006) also examined the relationship between inward FDI, FPI and economic growth in America using a VAR model. They found that a complementary relationship exists between FDI and FPI, noting that the influence of FPI on FDI was stronger than that of FDI on FPI. The findings on the complementary relationship between FDI and FPI in the selected African economies are in line with theory and earlier empirical studies.

Although the results in Table 5.16 indicate the existence of a strong, long-run relationship between FDI, FPI and the financial market variable of SMCAP, and significant but weak long-run relationships between FDI, FPI and individual financial market variables of SMTVT and PCRED, respectively (when FDI was the dependent variable); cointegrating relationships do not necessarily imply causality. The Granger causality tests however revealed that FDI Granger-causes SMCAP and PCRED (unidirectional causality), but not SMTVT. Furthermore, FDI was found to Granger-cause overall financial market development as measured by the composite FMD index.

In the case of the existence of long-run relationships between FDI, FPI and financial market variables (CCBA, LIQLI) as per the ARDL results, the test evidence was inconclusive at 10% level of significance. The Granger causality tests also confirmed this finding as no causal relationships were identified between any of the FDI, FPI and

these individual FMD variables (CCBA, LIQLI). A significantly weak long-run relationship was earlier identified between FDI and SMTVT, but there was no evidence of Granger-causality between the two variables.

Thus, foreign direct investment (FDI) inflows to the selected African countries Granger-cause foreign portfolio investment (FPI), stock market capitalisation (SMCAP), domestic credit to the private sector by banks (PCRED) and the overall status of financial market development (measured using the composite FMD_INDEX); all of which were earlier tested for the existence of long-term relationships with the dependent variable (FDI). These results can be supported by the findings of Soumaré and Tchana (2015) who examined the relationship between FDI and FMD in 29 emerging market economies from 1994 – 2006. They found that FDI and stock market FMD variables of SMCAP and SMTVT have a simultaneous and positive impact on each other (bi-directional causality), while the results from banking sector variables of PCRED, CCBA and LIQLI were ambiguous and inconclusive. Hanif and Shariff (2016) in their assessment of the relationship between FDI and FMD in five ASEAN countries also concluded the existence of uni-directional causality from FDI to credit to the private sector by banks.

Lastly, as indicated in Table 5.18 above, we tested for causality between FPI and the FMD index and found a bi-directional causal relationship between the two time series, which was statistically stronger from the FMD_INDEX to FPI than from FPI to the FMD_INDEX.

However as per the evidence reflected in Table 5.18, when FPI and individual FMD variables were regressed as the dependent variables, there was no evidence of long-run (cointegrating) relationships between FDI, FPI and any of the individual financial market variables (SMCAP, SMTVT, PCRED, CCBA, LIQLI). As such, since there was no evidence of any cointegrating relationships between FPI and any of the individual FMD variables, there was no need to test for Granger causality of FPI inflows and the individual financial market development variables, respectively.

In summary, there was reasonable evidence of bi-directional Granger causality between FDI and FPI, as well as FPI and the composite FMD index. Also, we

established uni-directional Granger causality from FDI to SMCAP, FDI to PCRED and FDI to the composite FMD index. The study however revealed no causality from any of the individual FMD variables to both FDI and FPI flows, implying that the individual FMD variables were influenced more by the international capital flows than the other way round.

5.5 Chapter summary and conclusion

The main objective of this chapter was to empirically test the research objectives. A detailed analysis of the panel data was undertaken, commencing with simple statistical analysis such as examining the descriptive statistics of our variables of interest.

5.5.1 Determinants of FDI and FPI

Objective One, which required the empirical identification of determinants of FDI and FPI, respectively, was fulfilled. The study revealed that FDI inflows to the sampled African countries were determined by agglomeration effects (previous period's FDI inflows), FPI, human capital, real GDP growth rate, interest rates, inflation, infrastructure, trade openness, institutional quality, and natural resources. Individual financial market variables responsible for the attraction of FDI inflows were stock market capitalisation, stock market total value traded, commercial bank assets gauged against commercial and central bank assets, as well as domestic credit to the private sector by banks.

Foreign portfolio investment inflows to the selected African economies were dependent on FDI, exchange rates, stock market capitalisation, liquidity, previous period FPI inflows, capital account openness, and real GDP growth rates. The findings were supported by various theories and earlier empirical studies as outlined in the literature review chapter.

5.5.2 Principal components analysis

We developed financial market development and infrastructural development indices for the African countries of interest. We developed an index for infrastructural

development in Africa using transport, energy and telecommunications variables sourced from the World Bank Development Indicators. In addition to the infrastructural development index, we also developed a composite financial market development index comprising of the five individual FMD variables of stock market capitalisation, stock market total value traded, commercial bank assets gauged against commercial and central bank assets, as well as domestic credit to the private sector by banks. A combination of the composite indices of financial market development and infrastructural development affirmed the more dominant and significant determinants of FDI to the sampled African economies.

5.5.2.1 FDI determinants using the FMD and infrastructural development indices

The composite index of infrastructural development had a positive and highly significant effect on FDI inflows to the selected African countries. The application of the composite index for infrastructure resulted in no further changes in terms of effect and significance to any of the other explanatory variables as initially captured in Table 5.4. Thus, in the presence of a composite infrastructural development index, the determinants of foreign direct investment flows to Botswana, Cote d'Ivoire, Egypt, Kenya, Mauritius, Morocco, Nigeria, South Africa and Tunisia remained the same as when initially tested using the fixed telephone lines per 1,000 people of the population as the original proxy for infrastructural development. This inferred that the proxy adopted to measure infrastructural development in African economies can be a simplistic one such as fixed telephone lines or a more comprehensive index such as the one used after principal components analysis in this study, but the overall impact remains largely unchanged due to the presence of stronger explanatory variables.

With regards to the financial market development composite index, we found that in the presence of the above-discussed explanatory variables, financial market development has a positive and highly significant effect on the attraction and retention of foreign direct investment inflows to the countries of interest in this study. Due to the complementarity of all five measures of different aspects of financial market development, the significance of financial market development in our sample of African

economies is greatly underpinned as the banking sector and stock markets both serve as conduits for the absorption of foreign investments.

We then concluded by reaffirming the work of Soumaré and Tchana (2015) who also noted that the importance of financial market development holds true in emerging markets whose stock markets are more advanced and sophisticated than those in developing countries. Although in July 2016, the World Bank changed country classifications, and eliminated the distinction between developed and developing economies, opting rather to group countries using geographical coverage and income levels (Somvanshi, 2016), for the purposes of this study, we maintained the previous economic market definitions. According to Prosser (2012), the distinction between developed, developing and emerging markets, though important, is difficult to clarify.

Developed markets are economies characterised by high GDP per capita income, highly developed capital markets with high levels of liquidity and large market capitalisation, as well as advanced built transport and communications infrastructure such as in the United States of America, the United Kingdom, Japan, Germany, Australia and Canada (NASDAQ, 2012).

Emerging markets are defined as those economies typified as experiencing rapid growth and development but have lower per capita incomes and less mature capital markets than those of developed countries. According to NASDAQ (2012), emerging markets include BRICS (Brazil, Russia, India, China, South Africa) and PIIGS (Portugal, Ireland, Italy, Greece, Spain) clusters. A recent phenomenon is that of frontier markets, which are essentially a subset of emerging markets, regarded as having little market liquidity, slightly developed capital markets and lower per capita income than the more developed typical emerging markets. These frontier markets include CIVET (Colombia, Indonesia, Vietnam, Egypt, Turkey) as well as Nigeria, Bangladesh and Botswana. It is these frontier markets which are sometimes referred to as developing markets as their economies are the exact opposite of developed countries' ones, particularly portraying low GDP per capita levels.

5.5.2.2 FPI determinants using the FMD index

The financial market development index had a positive impact on the FPI inflows to the countries of interest in Africa at the 5% level of significance. The first lag of FPI (agglomeration effect), FDI flows, and the real exchange rate also had a positive effect on inward FPI flows, while the real GDP growth rate, the rate of inflation and capital account openness all resulted in negative influences on FPI flows.

The application to the FPI regression of the financial market development index yielded better results than the standalone variables of liquid liabilities of the financial system (M3) divided by GDP (LIQLI), the ratio of commercial bank assets divided by commercial bank plus central bank assets (CCBA), domestic credit by banks to the private sector, as a percentage of GDP (PCRED), stock market capitalisation as a percentage of GDP (SMCAP) and stock market value traded as a percentage of GDP (SMTVT).

Overall financial market development in the selected African economies of Botswana, Cote d'Ivoire, Egypt, Kenya, Mauritius, Morocco, Nigeria, South Africa and Tunisia had a positive and highly significant effect on foreign portfolio investment flows to those countries, thereby supporting the need to continue developing both the banking sector and stock markets in those economies. The financial sector alone has been proven to be inadequate to serve the needs and meet the requirements of foreign portfolio investors.

5.5.3 Unit root, serial correlation and cointegration tests

Following the confirmation of the FDI and FPI inflow determinants, we conducted various unit root and serial correlation tests on the key dependent variables and their financial market development determinants, specifically. It emerged that all our variables under study were integrated order one $I(1)$, with the exception of FDI inflows which were found to be stationary at level $I(0)$. This was an important finding since the ARDL method required that there be no integration of order two $I(2)$ in any variables under study. Thereafter, assessments of the existence of long-run

(cointegrating) and short-run relationships between FDI, FPI and FMD variables, respectively were done.

The cointegration and error correction models were applied to satisfy Objective Two whose aim was to understand the long-run relationships between FDI, FPI and FMD (individual variables and index), respectively. There was evidence of cointegrating relationships between FDI, FPI and individual FMD variables of SMCAP, SMTVT and PCRED when FDI was the dependent variable. However, there was no such evidence in the case of CCBA and LIQLI as the test evidence was inconclusive. When examining FPI and FMD variables as the dependent variables, there was no evidence of cointegrating relationships between FDI, FPI and individual FMD variables in the study. However, it was established that cointegrating relationships existed between FDI and the financial market development index (FMD_INDEX), as well as FPI and FMD_INDEX, giving us reason to further examine these times series' for Granger-causality properties.

5.5.4 Granger causality tests

Lastly, having successfully assessed the long-run relationships, the third and final objective was to determine the direction of causality between FDI, FPI and FMD variables (individual and index), where cointegrating relationships were found to exist. Using Granger causality tests, we established only seven causal relationships. We also concluded the existence of bi-directional causality between FPI and the FMD index, as well as between FDI and FPI, in line with theory (Pfeffer, 2008), as well as earlier empirical studies by Xue-jun Kang (2006) and Noman *et al.* (2015). There was uni-directional causality from FDI to stock market capitalisation, FDI to domestic credit to the private sector by banks and FDI to the FMD index. We did not test for causality for FPI and the individual FMD variables as there were no cointegrating relationships found earlier.

The next chapter presents the concluding chapter to the study, highlighting the main findings, considering the policy implications of the study's findings, as well as making suggestions for future research studies.

Appendix 1

Correlation matrices

According to Gitman *et al.* (2010), a correlation coefficient is a number that represents the degree of association between two sets of variables. It ranges from +1 (perfect positive correlation) through 0 (no correlation at all) to -1 (perfect negative correlation). Below are the correlation matrices for the FDI and FPI models, respectively. The rule of thumb conventional cut-off criteria is that correlations between any two variables should not be above 0.8 (80%). Any correlation coefficient above 0.8 implies that the variables vary together in the sense that when one is high, the other will also be high; and when one is low, the other will also be low.

As can be assessed from Tables A5.1, A5.2, A5.3 and A5.4 below, respectively, the only problematic correlation was found to be between stock market capitalisation and stock market total value traded in the FDI regression (see Table A5.3 below). This high correlation between the two variables was addressed by the application of a financial market development index comprised of five individual FMD variables, instead of depending only on the two stock market variables as a measure of financial market development in our countries of interest (see Table A5.4 below).

Table A5.1: FPI correlation matrix

	FPIGDP	CCBA	INFL	KAOPEN	LIQLI	PCRED	REXCR	RGDPG	SMCAP	SMTVT	FPIGDP(-1)	FDIGDP
FPIGDP	1.0000											
CCBA	0.1983	1.0000										
INFL	-0.3430	-0.1568	1.0000									
KAOPEN	0.2369	-0.1040	-0.1189	1.0000								
LIQLI	0.6010	-0.2573	-0.1036	0.3844	1.0000							
PCRED	0.6475	-0.0892	-0.2042	0.5240	0.9253	1.0000						
REXCR	-0.2323	0.2899	0.0606	0.0391	-0.0688	0.0732	1.0000					
RGDPG	0.1593	0.0645	0.0380	-0.0115	0.0520	-0.0150	-0.3175	1.0000				
SMCAP	0.5374	0.0238	-0.0585	0.5843	0.6255	0.6245	-0.0708	0.3081	1.0000			
SMTVT	0.3270	-0.4906	0.0553	0.2948	0.6694	0.5025	-0.1915	0.2143	0.6659	1.0000		
FPIGDP(-1)	0.7562	0.2021	-0.3211	0.2714	0.5627	0.6541	-0.2283	0.2561	0.5004	0.2051	1.0000	
FDIGDP	0.4701	0.0528	-0.1631	0.2314	0.1225	0.1330	-0.6152	0.2946	0.4371	0.2135	0.4929	1.0000

Table A5.2: FPI correlation matrix (FMD index)

	FPIGDP	INFL	KAOPEN	REXCR	RGDPG	FPIGDP(-1)	FDIGDP	FMD_INDEX
FPIGDP	1.0000							
INFL	-0.3430	1.0000						
KAOPEN	0.2369	-0.1189	1.0000					
REXCR	-0.2323	0.0606	0.0391	1.0000				
RGDPG	0.1593	0.0380	-0.0115	-0.3175	1.0000			
FPIGDP(-1)	0.7562	-0.3211	0.2714	-0.2283	0.2561	1.0000		
FDIGDP	0.4701	-0.1631	0.2314	-0.6152	0.2946	0.4929	1.0000	
FMD_INDEX	0.5677	-0.0603	0.4860	-0.0959	0.1955	0.4914	0.2753	1.0000

Table A5.3: FDI correlation matrix

	FDIGDP	FPIGDP	CCBA	HUMCA	INFL	INFRAS	INSTQ	INTR	LIQLI	NATRES	PCRED	REXCR	RGDPG	SMCAP	SMTVT	TRDOPN	FDIGDP(-1)
FDIGDP	1.0000																
FPIGDP	0.1943	1.0000															
CCBA	-0.1896	0.0038	1.0000														
HUMCA	0.0528	0.2222	0.4241	1.0000													
INFL	0.1839	0.0986	-0.2950	0.1278	1.0000												
INFRAS	-0.0108	0.2915	0.5763	0.5648	-0.2291	1.0000											
INSTQ	-0.1553	0.2679	0.6777	0.5501	-0.0533	0.6819	1.0000										
INTR	-0.1544	-0.0153	-0.4347	-0.2285	0.3828	-0.3671	-0.0774	1.0000									
LIQLI	-0.2036	0.0276	0.2906	0.3762	-0.2508	0.7310	0.3773	-0.2238	1.0000								
NATRES	0.2264	-0.1887	-0.5073	-0.2255	0.2232	-0.5870	-0.6635	-0.0245	-0.5021	1.0000							
PCRED	-0.2349	0.3300	0.5167	0.5758	-0.1822	0.7612	0.5252	-0.3167	0.6384	-0.3771	1.0000						
REXCR	-0.0584	-0.2306	-0.1796	-0.6011	0.0664	-0.5683	-0.2693	0.4996	-0.4671	0.0392	-0.5068	1.0000					
RGDPG	0.2021	0.1631	0.2020	0.2127	-0.0261	0.2336	0.2014	-0.2258	0.1875	-0.1128	0.0554	-0.2889	1.0000				
SMCAP	-0.1728	0.3419	0.4110	0.4197	-0.0740	0.5293	0.5163	0.0155	0.3143	-0.2159	0.6535	-0.0739	0.0951	1.0000			
SMTVT	-0.1346	0.3500	0.4286	0.4889	-0.0812	0.5729	0.4559	-0.2067	0.4147	-0.0933	0.7022	-0.2763	0.1798	0.8785	1.0000		
TRDOPN	0.2523	0.0042	0.3440	0.1446	-0.0734	0.3181	0.3608	-0.0986	0.0698	-0.5883	-0.0252	0.0455	0.1494	-0.1434	-0.2654	1.0000	
FDIGDP(-1)	0.7096	0.1806	-0.2093	-0.0084	0.1716	-0.0724	-0.1686	-0.0811	-0.2202	0.2340	-0.2943	-0.0078	0.0927	-0.2455	-0.1825	0.2651	1.0000

Table A5.4: FDI correlation matrix (infrastructure and FMD indices)

	FDIGDP	FPIGDP	HUMCA	INFL	INSTQ	INTR	NATRES	REXCR	RGDPG	TRDOPN	FDIGDP(-1)	INFRAS_IND	FMD_INDEX
FDIGDP	1.0000												
FPIGDP	0.1943	1.0000											
HUMCA	0.0528	0.2222	1.0000										
INFL	0.1839	0.0986	0.1278	1.0000									
INSTQ	-0.1553	0.2679	0.5501	-0.0533	1.0000								
INTR	-0.1544	-0.0153	-0.2285	0.3828	-0.0774	1.0000							
NATRES	0.2264	-0.1887	-0.2255	0.2232	-0.6635	-0.0245	1.0000						
REXCR	-0.0584	-0.2306	-0.6011	0.0664	-0.2693	0.4996	0.0392	1.0000					
RGDPG	0.2021	0.1631	0.2127	-0.0261	0.2014	-0.2258	-0.1128	-0.2889	1.0000				
TRDOPN	0.2523	0.0042	0.1446	-0.0734	0.3608	-0.0986	-0.5883	0.0455	0.1494	1.0000			
FDIGDP(-1)	0.7096	0.1806	-0.0084	0.1716	-0.1686	-0.0811	0.2340	-0.0078	0.0927	0.2651	1.0000		
INFRAS_IND	-0.2002	0.4646	0.2726	0.0683	0.3278	-0.0396	0.0169	-0.2331	-0.0504	-0.3625	-0.2632	1.0000	
FMD_INDEX	-0.1946	0.3455	0.5430	-0.1384	0.5559	-0.2084	-0.2594	-0.3192	0.1585	-0.1578	-0.2543	0.6881	1.0000

Appendix 2

GMM dynamic first-difference panel data estimation

To overcome the challenge of endogeneity, earlier researchers made use of the instrumental variable Two Stage Least-Square estimation (2SLS) technique (Alagidede & Mensah, 2016). However, this estimator is inefficient in the presence of heteroscedasticity. We employed a GMM-based estimator, which allows for the efficient estimation in the presence of arbitrary heteroscedasticity, as it invokes the orthogonality conditions (Hansen, 2000; Hayashi, 2000). Specifically, we made use of the difference GMM estimator, also known as the Arellano-Bond linear dynamic estimator (Arellano & Bond, 1991). This approach is suitable in instances where we have lagged endogenous variables as instruments and cross-section fixed effects.

Rousseau and Wachtel (2000) used the *difference* panel estimator as developed by Arellano and Bond (1991) which (i) differences the dependent regression equation to remove any bias created by unobserved country-specific effects, and then (ii) instruments the right-hand-side variables (the differenced values of the original regressors) using lagged values of the original regressors to eliminate potential parameter inconsistency arising from simultaneity bias.

The Arellano-Bond estimation is expressed as the first difference of *Equations (5.30)* and *(5.31)* as follows:

$$\begin{aligned} FDIGDP_{it} - FDIGDP_{it-1} &= \lambda_1(FDIGDP_{it-1} - FDIGDP_{it-2}) + \lambda_2(FPIGDP_{it} - FPIGDP_{it-1}) \\ &+ \lambda_3(FMD_{INDEX_{it}} - FMD_{INDEX_{it-1}}) + \sum_{j=1}^n \lambda_j (X_{it} - X_{it-1}) \\ &+ (\varepsilon_{it} - \varepsilon_{it-1}) \end{aligned} \tag{5.30}$$

$$\begin{aligned}
FPI GDP_{it} - FPI GDP_{it-1} &= \lambda_1(FPI GDP_{it-1} - FPI GDP_{it-2}) + \lambda_2(FDIGDP_{it} - FDIGDP_{it-1}) \\
&+ \lambda_3(FMD_{INDEX_{it}} - FMD_{INDEX_{it-1}}) + \sum_{j=1}^n \lambda_j (X_{it} - X_{it-1}) \\
&+ (\varepsilon_{it} - \varepsilon_{it-1})
\end{aligned}
\tag{5.31}$$

Where:

$FDIGDP_{it}$ = the inflow of FDI as a percentage of GDP into country i for time t

FDI_{it-1} = effect of the previous period's FDI measured as the first lag of the FDI inflows scaled by GDP into country i for time $t-1$

FPI_{it} = the inflow FPI inflows as a percentage of GDP into country i for time t

FPI_{it-1} = effect of the previous period's FPI measured as the first lag of the FPI inflows scaled by GDP into country i for time $t-1$

$FMD_{INDEX_{it}}$ = the first principal component for financial market development in country i for time t

$FMD_{INDEX_{it-1}}$ = the initial level of the first principal component for financial market development in country i

X_{it} = the set of control variables country i for time t

X_{it-1} = the set of control variables country i for time $t-1$

ε_{it} = the error term country i for time t

ε_{it-1} = country i for time $t-1$

The control variables include human capital development, infrastructural development, inflation, interest rates, trade openness, institutional quality, natural resource endowment, and real GDP growth rates.

The first-difference transformation removes cross-section fixed effects, which may be correlated with the exogenous variables. The cross-section fixed effects do not vary with time, hence can be easily removed through the first difference transformation. Failure to remove them, could lead to biases in the estimations.

It is instructive to note that the error term in the first-difference equations ($\varepsilon_{it} - \varepsilon_{it-1}$) tend to be correlated with $(FDIGDP_{it-1} - FDIGDP_{it-2})$ and $(FPIGDP_{it-1} - FPIGDP_{it-2})$ in the respective equations, which may pose endogeneity problems. This problem is however resolved by including the lagged endogenous and exogenous variables as instruments as proposed by Arellano and Bond (1991). By instrumenting the first differenced lagged dependent variable in *Equations (5.30) and (5.31)* with its past levels (as done by the differenced GMM estimator), we are also able to control for any potential autocorrelation.

In line with the above discussion, this study included lagged endogenous and exogenous variables as instruments in the difference equation. However, by including lagged endogenous and exogenous variables as instruments, we are only controlling for weak forms of endogeneity. In other words, these variables may not be correlated with the error term, as is required, but could be influenced by the dependent variable. Thus, we perform the Sargan/Hansen test of over-identifying restrictions (i.e. j-statistic) to test the overall validity of the instruments in our models by analysing the sample analogue of the moment conditions used in the estimation process. An alternative test examines the hypothesis that the error term ε_{it} is not serially correlated. We test whether the differenced error term is second-order serially correlated (by construction, the differenced error term is probably first-order serially correlated even if the original error term is not). Failure to reject the null hypotheses of both tests gives support to our model.

The Sargan test of over-identifying restrictions is robust when the instrument rank is greater than the number of coefficients estimated in the model. The reported J-statistic is simply the Sargan statistic. Since the instrument rank is greater than the number of estimated coefficients in the various models, we proceed to construct the Sargan test of over-identifying restrictions, under the null hypothesis that the over-identifying restrictions are valid. The test statistic is distributed as $\chi(p - k)$, where p is the instrument rank and k is the number of estimated coefficients. The p-values (>0.05) confirm the validity of our instrumentation approach.

The dynamic panel GMM model regression results for FDI using the first difference model are shown in **Table A5.6** below.

Table A5.6: Panel GMM Regression Results on the Determinants of FDI in selected African economies using first-differences

Instrument specification: @DYN(LFDIGDP,-2)

Variable	t-stat (std error)	Coefficient
FDIGDP(-1)	6.1411*** (0.3406)	2.0916
FPIGDP	0.9569 (0.1520)	0.1455
HUMCA	2.875*** (9.4922)	27.2935
INFL	1.1665 (0.2017)	0.2353
INTR	0.4681 (2.2946)	1.0741
TRDOPN	2.5598** (0.3182)	0.8146
INSTQ	-0.2789 (5.7590)	-1.6064
NATRES	0.8834 (0.6384)	0.5639
RGDPG	-0.1742 (0.4953)	-0.0863
FMD_INDEX	4.3856*** (2.3065)	10.1153
INFRAS_INDEX	1.0792 (3.4172)	3.6878

Note: FDIGDP is the ratio of foreign direct investment (FDI) to gross domestic product (GDP). FDIGDP(-1) is the first lag of FDI. FPIGDP is the ratio of foreign portfolio investment (FPI) to GDP. HUMCA is the level of education measured by the gross enrolment ratio for primary education. INFL is the percentage change in the GDP deflator. FMD_INDEX is the principal component for five variables of financial market development. INTR is the lending interest rate, adjusted for inflation by the GDP deflator. TRDOPN is the sum of imports and exports scaled by GDP. INSTQ is a measure of legal, political and economic institutional quality. NATRES is total natural resources (the sum of oil, gas, coal, forest and mineral resources) scaled by GDP. RGDPG is the real GDP growth rate. INFRAS_INDEX is the first principal component for infrastructural development based on the five individual variables for air, railways, electricity, energy and telephones * significant at 10%; ** significant at 5%; *** significant at 1%. Instrument rank: 12; j-statistic: 9

With reference to Table A5.6, we re-examined all the earlier identified variables which serve as determinants of inward FDI into the sampled African countries. Initially, in Chapter 5 (see Table 5.8), we regressed FDI against five individual measures of financial market development. Having found a high correlation between stock market capitalisation and stock market total value traded, we constructed a composite index to capture the five banking sector and capital market development variables and examine their effect on FDI and other explanatory variables in this study. Furthermore, we applied an infrastructural development index comprised of electricity consumption per capita, energy use, air freight, railway transport and telephone lines (fixed and mobile) per 1,000 people of the population, as derived from the World Bank database.

It was found that the effect of past FDI flows on the current FDI flows, human capital development and the composite financial market development index remained positive and highly significant at 1% in respect of FDI attraction. Trade openness (TRDOPN) remained positive and had a 5% significant effect on FDI inflows in the selected African economies. All other variables of FPI, inflation, interest rates, natural resources and the infrastructural development index positively but not significantly affected FDI inflows. Only institutional quality and real GDP growth rates remained bearing a negative effect on FDI inflows to our African countries under survey.

As per earlier results in this chapter, the real GDP growth rate (RGDPR) remained negative and insignificant, in terms of attracting FDI inflows to Africa. The finding was in line with the earlier research of Anyanwu and Yameogo (2015) who considered the real GDP growth rate to be a measure of a country's track record, serving as an indicator to potential investors of the existence of profitable investment opportunities, as well as the attractiveness of the host country's market (Asiedu, 2013). With an array of drivers of FDI to African countries such as natural resource endowment, and a large pool of human capital, amongst others, the real GDP growth rate of such countries becomes irrelevant in FDI decisions of international investors (Addison & Heshmati, 2003).

To control for endogeneity, we performed the Sargan/Hansen test of over-identifying restrictions (i.e. j-statistic) to test the overall validity of the instruments in our model by analysing the sample analogue of the moment conditions used in the estimation

process. The reported J-statistic is simply the Sargan statistic. Since the instrument rank is greater than the number of estimated coefficients in the above model, we examined properties under the null hypothesis that the over-identifying restrictions are valid. The test statistic is distributed as $\chi(p - k)$, where p is the instrument rank and k is the number of estimated coefficients. The p-values (>0.05) confirm the validity of our instrumentation approach.

Having assessed the determinants of FDI using the difference panel GMM model, we also applied the same to foreign portfolio investment. The results of the dynamic panel data GMM model for our FPI regression are shown in Table A5.7 below.

Table A5.7: Panel GMM Regression results on the determinants of FPI in selected African economies using first-differences

Instrument specification: @DYN(LFPIGDP,-2)

Variable	t-stat (std error)	Coefficient
FPIGDP(-1)	1.2083 (3.3850)	4.0899
FDIGDP	0.4635 (1.3075)	0.6060
REXCR	1.9722* (5.2602)	10.3742
RGDPG	1.2830 (1.9940)	0.2558
INFL	-1.1708 (1.9718)	-2.3087
KAOPEN	-0.4882 (0.5446)	-0.2659
FMD_INDEX	0.8069 (2.0136)	16.2480

Note: FPIGDP is the ratio of foreign portfolio investment (FPI) to GDP. FPIGDP(-1) is the lag of the dependent variable measuring agglomeration effects. FDIGDP is the ratio of foreign direct investment (FDI) to gross domestic product (GDP). REXCR is the real exchange rate. RGDPG is the real GDP growth rate. KAOPEN is Chinn and Ito's index of capital account openness. FMD_INDEX is the composite financial market development index. INFL is the percentage change in the GDP deflator. Standard error is in the parentheses. Instrument rank: 12; j-statistic: 6.

* significant at 10%; ** significant at 5%; *** significant at 1%.

Using the composite FMD index, the first lag of FPI was positive, thereby supporting the proposition that prospective investors do examine past trends of FPI prior to making financial commitments in foreign countries. In addition, the financial market development index itself also had a positive impact on the attraction of FPI to the African countries under study. Foreign direct investment (FDI), real GDP growth rate and the real exchange rate were found to still have a positive but insignificant effect on FPI inflows in the presence of the comprehensive FMD index, capital account openness and the rate of inflation all had an insignificant but negative effect of FPI.

Chapter Six: Conclusion

6.1 Introduction

This chapter presents the conclusion to the study. It provides a summary of what the study set out to achieve, briefly discusses the key findings, and emphasises the contributions made to knowledge. In addition, the chapter examines policy implications of the empirical evidence and proposes some recommendations, ending with suggestions for possible future research.

6.2 Motivation and aim of the study

The broad aim of this thesis was to examine the role played by domestic financial market development (FMD) in influencing a country's ability to attract foreign capital (FDI and FPI) flows in selected African economies, and to determine the direction of causality thereof. The study sought to achieve this by identifying and tracing the long-term and causal relationships between foreign direct investment, foreign portfolio investment and domestic financial markets in selected African countries over the period 1980 – 2014, respectively.

This study was motivated by the apparent negative perception of FPI flows, not only in African countries, but world over, due to their seemingly short tenure. Despite this short-term characteristic of FPI, such inflows play a notable role in filling temporary shortfalls and gaps of funding in the Balance of Payments (BOP) accounts of countries. The continued reduction in the availability of foreign aid to developing countries thus requires a policy shift towards opening up economies and improving national images in order to attract long term FDI flows to African countries. Having advocated for a strategy involving the use of FPI to cover short-term financing gaps of firms, and FDI for long term investments, it also emerged that the level of financial market development played a key role in attracting and retaining international capital flows.

6.3 Summary of findings

6.3.1 Key determinants of FDI and FPI in Africa

In solving the first research question of this study, we examined the key drivers of FDI and FPI inflows, respectively, to the sample of African countries. The study revealed that agglomeration effects (previous period's FDI inflows), FPI, human capital, real GDP growth rate, interest rates, inflation, infrastructure, trade openness, institutional quality, natural resources were the main economic drivers of FDI inflows to the sampled African countries. Individual financial market variables responsible for the attraction of FDI inflows were stock market capitalisation, stock market total value traded, commercial bank assets gauged against commercial and central bank assets as well as domestic credit to the private sector by banks.

The infrastructural development index, which was regressed against FDI in place of the earlier infrastructure proxy of fixed telephone lines per 1,000 people of the population, as well as the financial market development index which was regressed in place of the individual FMD variables, both had positive and highly significant effects on inward FDI flows. The application of the composite indices also further magnified the effect of the other earlier identified determinants of FDI, implying that both infrastructural development and financial market development play a crucial role in the African economic landscape, insofar as foreign investment activities are concerned.

FPI inflows to the selected African countries were positively influenced by previous FPI inflows (agglomeration effects), FDI, exchange rates, and liquidity; while financial openness, the real GDP growth rate, rate of inflation and stock market capitalisation had a negative impact of FPI inflows to these countries. The negative interaction of financial openness and stock market capitalisation with FPI inflows serves to confirm the need to relax restrictions imposed on foreign investor funds, as well as an urgency to develop domestic stock markets to provide international investors with the relevant financial assets to purchase, and active markets in which to participate. The composite financial market development index exerted a positive and highly significant influence on inward FPI inflows. The application to the FPI regression of the financial market

development index yielded better results than the standalone variables of liquid liabilities of the financial system (LIQLI), the ratio of commercial bank assets divided by commercial bank plus central bank assets (CCBA), domestic credit by banks to the private sector, as a percentage of GDP (PCRED), stock market capitalisation as a percentage of GDP (SMCAP) and stock market value traded as a percentage of GDP (SMTVT).

Therefore, we concluded that overall financial market development in the selected African economies of Botswana, Cote d'Ivoire, Egypt, Kenya, Mauritius, Morocco, Nigeria, South Africa and Tunisia had a positive and highly significant effect on both foreign portfolio investment and foreign direct investment flows to those countries, thereby confirming the pivotal role of financial market development as sought to be established by this study.

Table 6. provides a summary of the key determinants of both inward FDI and FPI flows to our surveyed African economies.

Table 6.19: Summary of determinants and their effects

Dependent variable	Independent variable	Coefficient	Effect and significance
FDI	Effects of previous period's FDI (FDI_{t-1})	0.3677	Positive***
	Foreign portfolio investment (FPI)	1.9889	Positive***
	Human capital (HUMCA)	2.4968	Positive**
	Real GDP growth rate (RGDPG)	-0.8137	Negative *
	Real interest rate (INTR)	0.8088	Positive**
	Inflation (INFL)	0.3941	Positive***
	Infrastructure (INFRAS)	0.8688	Positive***
	Trade openness (TRDOPN)	2.3834	Positive***
	Institutional quality (INSTQ)	-5.5842	Negative***
	Natural resources (NATRES)	0.6668	Positive***
	Stock market capitalisation (SMCAP)	0.7727	Positive***
	Stock market total value traded (SMTVT)	-0.7123	Negative***
	Commercial bank to commercial and central bank assets (CCBA)	4.1894	Positive***
	Domestic credit to the private sector by banks (PCRED)	-1.3499	Negative***
	Composite financial market development index (FMD_INDEX)	0.2003	Positive***
	Infrastructural development index (INFRAS_INDEX)	0.0009	Positive***
FPI	Effects of previous period's FPI (FPI_{t-1})	0.0740	Positive
	Foreign direct investment (FDI)	3.4050	Positive***
	Stock market capitalisation (SMCAP)	-3.8937	Negative**
	Real exchange rate (REXCR)	1.7451	Positive***
	Financial openness (KAOPEN)	-0.3220	Negative
	Liquid liabilities (LIQLI)	5.0003	Positive***
	Real GDP growth rate (RGDPG)	0.4574	Positive
	Composite financial market development index (FMD_INDEX)	0.8401	Positive**

* significant at 10%; ** significant at 5%; *** significant at 1%.

6.3.2 Cointegrating relationships between FDI, FPI and FMD in Africa

Having identified the determinants of FDI and FPI to the African sample, we were also keen to observe the nature of relationships between foreign direct investment, foreign portfolio investment and financial market development using the panel data.

Using the autoregressive distributed lag (ARDL) bounds testing approach to cointegration, we assessed the variables for the existence of long run (cointegrating) relationships between FDI, FPI and FMD variables, respectively. There was evidence of cointegrating relationships between foreign direct investment, foreign portfolio investment and the individual FMD variables of stock market capitalisation (5% level of significance), stock market total value traded (10% level of significance) and domestic credit to the private sector by banks (10% level of significance), when FDI was the dependent variable. However, there was no such evidence in the case of the ratio of commercial bank to commercial and central bank assets (CCBA), or for liquid liabilities of the financial system (LIQLI), as the test evidence was inconclusive at the 10% level of significance.

Also, there was no evidence of cointegrating relationships between FDI, FPI and FMD variables in the study when FPI and FMD variables were regressed as the dependent variables.

The short-run relationships in the study were assessed using the vector error correction model (VECM). The error correction mechanism is a means of reconciling the short-run behaviour of an economic variable with its long-term trends (Gujarati & Porter, 2009). The results of the ECM indicated that there were both short and long run equilibrium within the system.

When FDI was interacted with FPI and SMCAP, the error correction term was found to be -0.2285, significant at 1%. This illustrated that the system corrected its previous period disequilibrium at a speed of approximately 22.85% annually to reach the steady state. The same analysis applied to FDI's interaction with FPI and the FMD variables of SMTVT, CCBA and LIQLI, where our evidence revealed highly significant ECTs (significant at 1%). Only the interaction between FDI and PCRED was -0.2194, and

significant at 5%. In this instance, 21.94% of the disequilibrium in the series was corrected within a year (as our data is on an annual basis). In the case of FDI's interaction with the composite FMD index, the ECT was -0.8899, and significant at 1% implying that the system corrected its previous period disequilibrium at a speed of approximately 88.99% annually to reach the steady state.

For FPI, the time series was significant at 5% only when interacted with FDI and FMD variables of SMCAP and SMTVT. The error correction terms were -0.1426 and 0.1325, respectively. This demonstrated that approximately 14.26% and 13.25% of the disequilibrium in the series were corrected within a year. The results of the interaction of FPI with the banking sector variables of PCRED, CCBA and LIQLI were negative but significantly weak. The interaction of FPI with the composite FMD index was insignificant and negative at -0.4098.

For the individual financial market variables, only SMCAP and CCBA were statistically significant in their interaction with FDI and FPI inflows. The 4.57% and 4.50% disequilibria between those time series could be corrected within a year, respectively. In the case where our ECT was negative but insignificant, we could not assume that it would effectively correct the model in the long run, although one could confirm that the time series do converge. Therefore, this applied to both the FMD index and the individual FMD variables of SMTVT, PCRED and LIQLI when interacted with FDI and FPI variables, respectively.

6.3.3 Causality between FDI, FPI and FMD in Africa

It would be misleading to assume that because cointegrating relationships were found, there must be causality among the three key variables. It was necessary to further inspect the long-term relationships in order to establish whether there is any causality between them.

We employed Granger causality testing to check for causality, and the direction thereof, between the FDI, FPI and FMD variables, where cointegrating relationships were found to exist. The three outcomes possible in the Granger causality testing were: uni-directional causality from any of the variables to the other(s), bi-directional

Granger causality, which by default would imply complementarity, and the absence of causality between our variables.

Table 6.20: Summary of Granger-causality test results

Dependent variable (X)	Independent variable (Y)	Direction of causality
FDI	FPI	
FPI	FDI	
FDI	SMCAP	
FDI	PCRED	
FDI	FMD_INDEX	
FPI	FMD_INDEX	
FMD_INDEX	FPI	

The evidence confirmed only seven causal relationships among the variables of interest in this study. Thus, in the presence of financial market development, there is bi-directional causality between foreign direct investment and foreign portfolio investment inflows, thereby confirming the complementarity of the two international capital flows, as well as between foreign portfolio investment and overall financial market development itself. Although the cointegration results earlier indicated the existence of a strong, long-run relationship between FDI, FPI and the individual financial market variable of SMCAP, and significantly weak long-run relationships between FDI, FPI and individual financial market variables of SMTVT and PCRED, respectively (when FDI was the dependent variable); cointegrating relationships did not necessarily imply causality. The Granger causality tests revealed that FDI Granger-causes SMCAP, PCRED and overall financial market development (FMD_INDEX) in the economies (uni-directional causality), but not SMTVT.

Furthermore, the test evidence of any cointegrating relationships between FDI, FPI and the banking sector variables (CCBA, LIQLI) was inconclusive at the 10% level of significance. The Granger causality tests also confirmed this finding as no causal relationships were identified between any of the FDI, FPI and these individual FMD

variables (CCBA, LIQLI). These findings were confirmed by the empirical study of Soumaré and Tchana (2015).

Lastly, having found no evidence of any cointegrating relationships between FDI, FPI and FMD, when FPI and individual financial market development variables were regressed as the dependent variables, there was no need to test for Granger causality. However, we applied the composite financial market development index to the FPI regression, and found bi-directional causality between foreign portfolio investment (FPI) and overall financial market development (FMD_INDEX).

There was reasonable evidence of bi-directional Granger causality between foreign direct investment and foreign portfolio investment, and foreign portfolio investment and overall financial market development, as well as uni-directional Granger causality from foreign direct investment to stock market capitalisation, from foreign direct investment to domestic credit to the private sector by banks and also from foreign direct investment to overall financial market development in Botswana, Cote d'Ivoire, Egypt, Kenya, Mauritius, Morocco, Nigeria, South Africa, and Tunisia.

In conclusion, this study has fulfilled the set objectives, and provided answers to the research questions posed. The main drivers of FDI and FPI to Botswana, Cote d'Ivoire, Egypt, Kenya, Mauritius, Morocco, Nigeria, South Africa, and Tunisia were identified. In addition, the long-run relationships between FDI, FPI and individual FMD variables and the composite index were established using ARDL, while the VECM highlighted the short-run relationships amongst the same variables. Lastly, Granger causality was found to exist from FDI to FPI, FDI to stock market capitalisation, FDI to domestic credit to the private sector by banks, and FDI to overall financial market development, respectively. On the other hand, FPI, was found to also Granger-cause overall financial market development and FDI, thereby confirming complementarity between FDI and FPI inflows in the presence of financial market development. Overall financial market development was found to Granger-cause FPI. Therefore, there was bi-directional causality between FPI and FDI, as well as FPI and overall FMD in the selected African economies.

6.4 Contribution to knowledge

This study contributes to the existing literature in a number of ways. First, it confirms the complementarity between FDI and FPI inflows, specifically in the African context. Moreso, rarely are the two international capital flows examined together. Earlier, this concept had only been theorised by Pfeffer (2008), and then empirically tested by Xuejun Kang (2006) in the American markets, as well as Noman *et al.* (2015) in 45 countries from developed, emerging and frontier markets.

Furthermore, using principal component analysis (PCA), we developed and applied two indices to our work, an infrastructural development index comprising of variables from the transport, energy and telecommunications sectors, as well as a financial market development index composed of the five individual FMD variables used throughout the study. The infrastructural development index was necessary to capture and reflect the infrastructural differences in the sample of African countries, as the application of a single variable such as fixed telephone lines per 1 000 people of the population would not have reflected an accurate status of the importance of infrastructure for the attraction of FDI flows to the surveyed countries. The effect of the results of the infrastructural development index was that it strengthened and magnified the results of the FDI regressions.

On the other hand, the incorporation of the financial market development index into this study, helped to emphasise the importance of the existence of both the banking sectors and the stock markets in African economies. This was due to the emergence of positive and highly significant impacts of overall financial market development on both FDI and FPI inflows, respectively. In terms of causality, bi-directional relationships were established between FPI and the overall FMD index, while uni-directional causality from FDI to the overall FMD index was determined. This study is different from other researches in that, in every interaction, both flows were included, hence even though the dependent variable may have been FDI for instance, it was regressed against FPI and FMD simultaneously as we aimed to understand the role of financial market development in a combined international capital flow strategy context (see Pfeffer, 2008). It was also confirmed that even in Africa, the two flows of FDI and FPI

are complementary to one another, in addition to being key determinants of each other, a crucial finding and contribution to knowledge for African countries specifically.

In addition, this study from the traditional variables of measuring institutional quality. We opted to use Kuncic's (2014) database of institutional quality. This database groups over 30 institutional indicators derived from different sources such as the Heritage Foundation, Freedom House, Fraser Institute, ICRG, World Bank World Governance Indicators (WDI), Polity and Transparency International into legal, political and economic institutions, with the objective of computing an index of institutional quality to capture the institutional environment (Kuncic, 2014). This made the database a more comprehensive index to apply than any of the other individual sources.

The last contribution made by this study is that despite limiting the study to only nine African countries, the results of the empirical panel study can be generalised to the rest of the continent, as we used random effects over fixed effects in the GMM methodology.

6.5 Policy implications and recommendations

This study raised stimulating policy implications for the governments of Botswana, Cote d'Ivoire, Egypt, Kenya, Mauritius, Morocco, Nigeria, South Africa, and Tunisia. These ranged from the strengthening of macroeconomic policies, to more specific investor-driven policies that sought to ensure the boosting of the domestic savings base, as well as the complementary international capital flows emanating from favourable investment policies, and bilateral and multilateral arrangements between countries in Africa and abroad.

The results underscored the important role played by financial market development in the attraction of international capital flows to the selected African economies. Well-developed domestic financial markets complement the efforts of FDI and FPI in raising much-needed additional capital at a low cost for future productivity locally, which in turn would improve economic growth rates.

Furthermore, the results of the determinants earlier showed that according to Chinn and Ito's measure of capital account openness, most of the surveyed countries' economies were in fact closed, thereby shutting out potential foreign investors. African governments should be conscientised on the benefits of financial market liberalisation and development, thereof. An open economy, complemented by financial market development and appropriate regulation, would play a significant role in attracting the type of international capital flow desired by the host country's level of economic development. It is anticipated that such action would then release state resources for expenditure on other sectors of the economy.

Due to the complementarity between FDI and FPI, a country able to attract the easier, and less-permanent FPI inflows to its financial sector, would equally be in an advantageous position, policy-wise, to also convince foreign investors to consider long-term investments in the host country in the form of FDI to its productive sectors of the economy. As such, since charity begins at home, African governments ought to transform their local financial markets. However, domestic financial market reforms must precede any policies that seek to attract foreign investment so as not to crowd out domestic firms and savers.

Based on the findings of this study, pertinent questions were raised regarding the significance of financial market development (FMD), where the five different measures comprising of both stock market and banking sector variables used to gauge the level of FMD, were not found to influence the attraction of FDI and FPI inflows to the selected African countries in our sample. Although in some instances, cointegration was identified, there was no causation between FPI and the individual FMD variables. Uni-directional causation emanated from FDI to stock market capitalisation, domestic credit to the private sector by banks and the overall financial market development index, thereby implying that the FDI and FPI inflows to Botswana, Cote d'Ivoire, Egypt, Kenya, Morocco, Nigeria, South Africa, and Tunisia, though complementary, were influenced more by other factors peculiar to these countries besides the presence and development of the stock markets and domestic banking sectors. An overall enhancement of the entire investment and policy environment would probably go a long way in improving the image of African countries. This could be achieved through an overhaul of the economic and institutional quality mechanisms in these countries.

Actions such as a reduction in the level of government consumption or the revision of foreign ownership regulations could have a significant impact on the investment climate and outlook of African countries as potential foreign investment destinations.

The complementarity between FDI and FPI presents countries with opportunities to improve their economic profiles and policies by ensuring that all identified drivers of the international capital flows are enhanced. Despite finding limited evidence to support the further development of domestic financial markets, since African countries at present attract FDI to extractive industries, governments should formulate investment policies which will diversify and develop its other economic sectors. This is because natural resources have a limited life span that will eventually be depleted. Inward FDI should be directed at economic sectors such as manufacturing, agriculture and even financial services, which in the long-run contribute to the employment of locals, ensure self-sufficiency of the country in terms of food supply and where production is targeted at the export market, provides an avenue for the generation of foreign currency earnings.

As concluded in this study, the two international capital flows are complementary in nature, and should both be encouraged. Pfeffer (2008) assessed the complementarity of FDI and FPI, and found that firms use FPI to adjust to short-term changes, while maintaining the status quo of FDI, hence a firm using the combined strategy (FDI and FPI) was more cost-effective and value-adding than using the isolated strategies (FDI only or FPI only). This actually works to the advantage of the host country because instead of experiencing capital flight, FDI remains within the country, while firms seek to raise further additional capital from domestic sources, or bring in foreign funds from their home countries. Either way, the capital inflow benefits the host country's economy.

The governments of African countries are therefore advised to formulate their macroeconomic and foreign investment promotion policies in consultation with the private sector to ensure that while attracting international capital flows, they are not infringing on the viability of domestic firms, to ensure sustainable economic growth, complemented by increased employment, reduced poverty and stronger institutions. Also, based on the outcome of the results with the inclusion of the composite

infrastructural development index for the sampled African countries, the study further recommends that governments invest more in improving their energy, transport and telecommunications infrastructure so as to enhance their ability to attract higher levels of foreign direct investment to their economies.

6.6 Suggestions for future research

Despite having conducted a comprehensive study examining the determinants of FDI and FPI, identifying the long-run relationships and direction of causality between FDI, FPI and FMD, it is not possible for a single study to cover all aspects of the FDI-FPI-FMD nexus. The results also point out that the effect of financial market development on FDI and FPI is dependent not only on the choice of stock market and banking sector development variables applied, but even the composition of the overall financial market development index. Hence, from our study, we identified potential further areas for future study or research.

We conjecture that future studies should examine whether there is a critical level of financial market development required for capital flows to be attracted to African countries. Foreign portfolio investment flows by their nature end up in the financial markets of countries. However, in this study's examination of the determinants of FPI inflows to Botswana, Cote d'Ivoire, Egypt, Kenya, Mauritius, Morocco, Nigeria, South Africa, and Tunisia, there was a negative relationship between stock market capitalisation and FPI, but a positive one between liquid liabilities and FPI. This implies that FPI was not only dependent on the size of the domestic stock markets, but rather positively influenced by the liquidity (M3) of the economy as a whole, as well as other country-specific factors. As such, it is plausible to question the notion that since the domestic financial markets, particularly stock markets, of the countries which were surveyed in this study are largely under-developed, the imminent benefits of financial market development perhaps only kick in after a certain threshold level. Depending on the econometric modelling technique adopted, this would require the introduction of an interaction term in the model (e.g. GMM), the identification of thresholds and turning points of the financial development and capital flows nexus, complemented by a thorough discussion of the implications thereof.

Also, the findings of Mauritius present an interesting argument on the importance of good quality institutions in FDI, FPI and FMD studies contextualised in Africa. Despite having little natural resource endowment, the country harnessed significant levels of FDI and FPI inflows in recent years. This was mainly attributable to its consistently high institutional quality score, as well as sound ICT infrastructure and financial services policies which ensured the efficient allocation of savings to productive sectors of its economy through its financial markets. Future research could therefore be carried out to examine the effects of institutions on financial market development, in the latter's role in FDI and FPI inflow attraction to African economies.

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