

Foreign Direct Investment and Welfare Dynamics in Africa

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DECLARATION

By submitting this thesis electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent explicitly otherwise stated), that reproduction and publication thereof by Stellenbosch University will not infringe any third-party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

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DEDICATION

To my daughter, Lisa Meameno, who was born on 16 September 2013, just three days
after successfully defending my PhD proposal.

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Fear thou not; for I am with thee: be not dismayed; for I am thy God: I will strengthen thee; yea, I will help thee; yea, I will uphold thee with the right hand of my righteousness. Isaiah 41:10.

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- *The Lord Almighty, may the glory be to Him!*

ABSTRACT

Industrialisation for broad-based development and economic transformation remains Africa's overarching priority. This dissertation examines the dynamics of how Foreign Direct Investment (FDI) translates into social welfare functions. A three, stand-alone papers structure is followed within the ambit of this dissertation. A set of welfare indicators, such as multifactor and non-monetary poverty measures, is employed to examine the welfare benefits/losses arising from FDI activities. The welfare aspect of society is a multidimensional phenomenon; however, most previous studies have employed a one-dimensional approach or income-based poverty metric which may not adequately capture the underlying dynamics.

This research study addresses the inadequacy of a conventional one-dimensional approach by employing a more comprehensive framework. The first paper aims to examine the welfare impact of FDI in a panel of 20 African countries during the period 2000–2013. The multifactor and non-monetary measures of welfare, as well as the non-linearity of FDI on welfare, are examined. In addition, the Driscoll and Kraay standard errors and the Augmented Mean Group (AMG) estimator by Eberhardt and Teal (2010) that account for cross-sectional dependency, endogeneity and heterogeneity within panel units, have been used. The results suggest that the effect of FDI on welfare exhibits a non-linear pattern, with initial increases in welfare being eroded after a turning point. It has also been found that FDI is ultimately welfare enhancing exclusively via health outcomes.

The second paper examines the effect of FDI on disaggregated levels of educational attainment in Africa on different levels of income groupings. An instrumental variable estimation technique within a Generalised Method of Moments (GMM) framework that controls for endogeneity has been employed. Additionally, the Driscoll–Kraay standard errors that are robust to cross-sectional and temporal dependency have been utilised. The findings indicate that FDI has a negative but transitory effect on human capital development. The quadratic term of FDI shows a positive effect, an indication

that there is a turning point after which the human capital-augmenting hypothesis is supported.

The last paper examines the effect of FDI on income inequality in a panel of 16 African countries for the period 1980–2013. To ensure consistent estimates, a Pooled Mean Group (PMG) estimator by Pesaran, Shin and Smith (1999) was used. Both the non-linear effect and heterogeneity were controlled by using a PMG estimator. There is robust evidence that the relationship is non-linear and a U-shaped effect of FDI on inequality is documented. The results reveal that FDI improves equal distribution of income in the countries that have been examined. However, this effect diminishes with further increases in FDI.

Policy implications that emanate from this study indicate that FDI can be used as a policy instrument to address Africa's developmental agenda. However, optimal efficacy of FDI differs across various indicators of economic welfare. Although FDI may be growth enhancing, Africa is still faced with a challenge of ensuring that the resulting FDI-induced growth leads to inclusive development. Therefore, FDI is not a panacea, but has the potential to serve as a catalyst for inclusive and sustainable economic development.

Keywords: FDI, welfare, human capital, inequality, Africa

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List of abbreviations and acronyms

AERC:	African Economic Research Consortium
AfDB:	African Development Bank
AMG:	Augmented Mean Group
ASEAN:	Association of Southeast Asian Nations
CCEMG:	Common Correlated Effects Mean Group
CES:	Constant Elasticity of Substitution
CSR:	Corporate Social Responsibility
DC:	Developing Country
DRC:	Democratic Republic of the Congo
ECA:	Economic Commission of Africa
ECM:	Error Correction Model
ECT:	Error Correction Term
FDI:	Foreign Direct Investment
GDP:	Gross Domestic Product
GMM	Generalised Methods of Moments
GNI:	Gross National Income
HDI:	Human Development Index
IHDI:	Inequality Adjusted Human Development Index
ILO:	International Labour Office
IMF:	International Monetary Fund
IPS:	Im–Pesaran–Shin
IV:	Instrumental Variables
KCM:	Knowledge–Capital Model
LDC:	Least Developed Country

MDG:	Millennium Development Goal
MG:	Mean Group
MNC:	Multinational Corporation
MNE:	Multinational Enterprise
MPI:	Multidimensional Poverty Index
OECD:	Organisation for Economic Co-Operation and Development
OLS:	Ordinary Least Squares
PMG:	Pooled Mean Group
SAARC:	South Asian Association for Regional Cooperation
SDG:	Sustainable Development Goal
SST:	Stolper–Samuelson Theorem
SUR:	Seemingly Unrelated Regression
SURE:	Seemingly Unrelated Regression Equation
SWIID:	Standardized World Income Inequality Database
UIS:	UNESCO Institute for Statistics
UNCTAD:	United Nations Conference on Trade and Development
UNDP:	United Nations Development Programme
UNECA:	United Nations Economic Commission for Africa
UNESCO:	United Nations Educational, Scientific and Cultural Organization
WDI:	World Development Indicator

CHAPTER 1

INTRODUCTION

1.1 Background of the study

Modern social welfare and international business literature have gained momentum during the twenty-first century. In the early nineteenth century, international business literature in terms of Foreign Direct Investment (FDI) mainly focused on the determinants and FDI-growth causality issues. In line with the year 2000 Millennium Development Goals (MDGs), the beginning of the twenty-first century was characterised by the need for a paradigm shift to address the socio-economic concerns of the world more adequately. This was evidenced by literature on technological productivity, institutions, and corporate social responsibility, among others. In the early twenty-first century, major issues revolve around the quality of life, which encompasses standard of living, education, and health, as well as other related social welfare indicators. The global target of the MDG framework and new Sustainable Development Goals (SDGs) calls for a comprehensive roadmap to tackle the pressing concerns of social welfare.

The concept of welfare is widely used in economic literature; however there is no universal acceptable definition (Brekke, 1997). Traditional economics defines welfare as a phenomenon that is “mainly connected to individual perception and utility of the use of income” (Greve, 2008:52). According to the social choice theory, welfare is defined as a composite of social preferences and fulfilment of hierachial vectors of needs (Sen, 1970). It entails economic and non-economic activities that are crucial in determining social wellbeing levels, quality and composition. Accordingly, societal welfare is defined as the aggregated sum of individual welfare (Sen, 1970). In 1967, the United Nations defined social welfare as “an organized function ... regarded as a body of activities designed to enable individuals, families, groups and communities to cope with the social problems of changing conditions. But in addition to and extending beyond the range of its responsibilities for specific services, social welfare has a further function within the broad area of a country’s social development. In this larger sense, social welfare should play a major role in

contributing to the effective mobilization and deployment of human and material resources of the country to deal successfully with the social requirements of change, thereby participating in nation-building" (Casmir & Samuel, 2015:237). The study adopts the UN and the social choice theory because they broadly capture the dimensions of both monetary and non-monetary indicators.

As globalisation intensifies, African economies have become more integrated in international business activities, presenting good prospects to address pressing social concerns. However, the hypothesised links between FDI and societal welfare remain one of the new unresolved debates in current literature (Gohou & Soumaré, 2012; Soumaré, 2015). The Knowledge-Capital Model (KCM) asserts that Multinational Corporations (MNCs) tend to induce technology transfer that enhances human capital through knowledge spillover (Carr, Markusen & Maskus, 2001). The proponents (Dunning, 1977; Mankiw, Romer & Weil, 1992; Hansen & Rand, 2006) of FDI further note that FDI has the potential to alleviate poverty through employment creation, human capital development, increase in income, and inequality reduction. Contrary to these propositions, Hymer (1968), Moran (1999) and Stiglitz (2002) theorise that FDI is prone to market imperfections and unequal bargaining power that may elevate inequality and impede welfare enhancement.

Empirical literature is filled with conflicting predictions on the impact of FDI on welfare and inequality issues. While Nyuur, Ofori and Debrah (2016), Lehnert, Benmamoun and Zhao (2013), Gohou and Soumaré (2012), Dollar and Kraay (2000) and Klein, Aaron and Hadjimichael (2001) support the welfare-enhancing hypothesis, Kosack and Tobin (2006) dismiss welfare gains, whereas Agarwal and Atri (2015), Chintrakarn, Herzer and Nunnenkamp (2012), as well as Calvo and Hernandez (2006) report mixed results. Feenstra and Hanson (1997), together with Te Velde and Morrissey (2004), shed some light on the distribution aspect of FDI. They report that FDI tends to induce employment bias towards skilled labour. This implies that the poor are less likely to benefit from the resulting increase in employment.

The 2000 MDGs aim to achieve universal human development and poverty reduction by 2015. With exception of North Africa, most African countries remain pessimistic about meeting the target date (IMF & World Bank, 2007; Easterly, 2009; ECA, AU,

AfDB & UNDP, 2012). The *MDG Report* (2014) asserts that Africa's progress on poverty and inequality reduction, employment creation and the merits of social services remains a challenge. The new SDGs further embrace the need for philanthropic commitments. In pillar one, the SDGs aim to improve structural economic transformation and inclusive growth (*MDG Report*, 2015). FDI has been employed by many economies as a strategy towards attaining some of the MDGs (World Bank, 1997; IMF, 1999; Overseas Development Institute, 2004; UNCTAD, 2005). However, the extent to which FDI enhances productivity that contributes towards economic development and hence, improved welfare and inequality is not adequately examined in Africa.

Africa represents an interesting case to evaluate the impact of FDI on welfare. Many countries were subjected to major economic stabilisation and structural adjustment programmes in 1980 that resulted in policy changes and FDI promotion strategies. The continent is not only lagging behind in terms of socio-economic development, but is also characterised by high levels of poverty and wage inequality. The percentage of the population living under \$1.25 a day in sub-Saharan Africa declined from 56.5 percent in 1990 to 48.5 percent in 2010, approximately 25 percent off track to meet the 2015 target, while North Africa has reached the target. Moreover, although poverty has declined, the population living under \$1.25 increased in sub-Saharan Africa from 289.7 million to 413.8 million over the period 1990–2010 (*MDG Report*, 2010). Despite Africa's efforts to comply with international institutions' policy advice of attracting FDI to enhance social welfare, Africa's social concerns, such as poverty alleviation, remain challenging. In this context, the need to evaluate welfare dynamics coupled with ambiguities within theoretical and empirical grounds calls for further research.

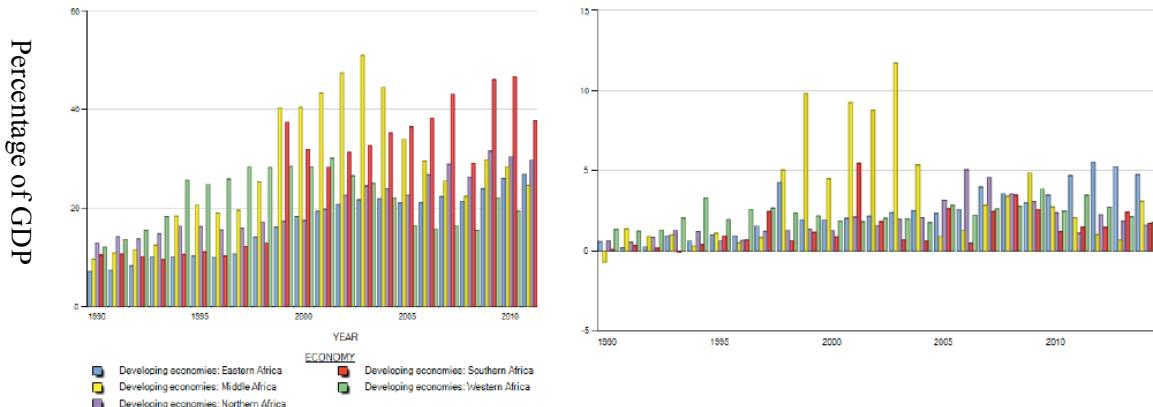


Figure 1.1: FDI patterns

Source: Author's computation, using UNCTAD statistics, 2013 database

Figure 1.1 (left panel) depicts the inward FDI stock as a percentage of GDP for the period 1990 to 2012 in Africa; the right panel depicts the same trend for FDI inflows. It can be observed that FDI stock has exhibited a positive trend on average. High volumes were recorded in Middle Africa and Southern Africa respectively, while lower volumes were reported in East Africa and West Africa. The inward FDI flows panel is highly uneven. High spikes are recorded for central Africa during the early 2000s but these drastically declined after 2010. Contrary to the stock pattern, East Africa has emerged since the year 2010 to top the region in terms of FDI flows. FDI is among the policy instruments implemented in Africa to aid broad-based development (IMF, 1999; UNCTAD, 2005). It is therefore important to examine how the prevailed increase in FDI translates into social welfare functions.

1.2 Statement of the research problem

FDI has been touted as important in helping close the development gaps through an increase in wages and employment, and subsequently reduce poverty and inequality. The literature is filled with extensive debates on the efficacy of FDI as a policy instrument to mitigate poverty issues. One strand of literature supports the hypothesis that FDI plays a pivotal role in fighting against poverty (Dollar & Kraay, 2000; Klein et al., 2001; Meyer & Sinani, 2009; Gohou & Soumaré, 2012; Lehnert et al., 2013).

The other strand of literature argues that FDI may not necessarily be welfare enhancing (Hymer, 1968; Campos & Kinoshita, 2002; Carkovic & Levine, 2002;

Blomström & Kokko, 2003; Calvo & Hernandez, 2006; Elmawazini, Atallah, Nwankwo & Dissou, 2013; Agarwal & Atri, 2015), because FDI generates market imperfection that impedes welfare gains. Moreover, Kosack and Tobin (2006) argue that FDI lowers the rate of human development in most less-developed economies. It appears that whether FDI is welfare enhancing or not depends on the nature and extent of the spillover effect; its veracity can only be ascertained with further empirical work. Empirical studies on FDI & welfare using measures other than economic growth are relatively few in Africa. Gohou and Soumaré (2012) and Sourer (2015) are among the first that used the multifactor indicator in Africa. This study builds on Gohou and Soumaré (2012) by capturing non-monetary indicators in addition to the HDI and also by identifying the turning points. This is an important contribution to the existing literature. There are differences in welfare dimensions and failure to account for these results in underestimating welfare impacts, which also pose dire implications for policy makers. The study further addresses the non-linear effect of FDI by estimating the turning points as well as accounting for heterogeneity within the cross-sectional units. Identifying the turning points across various welfare indicators is useful for policy formulation and provides a better understanding of the underlying relationships. In spite of this literature gap, many countries continue to attract foreign capital to enable them to address developmental issues such as poverty alleviation.

Existing empirical literature is also beset by methodological limitations. Firstly, the framework in current literature is dominated by one-dimensional monetary measures (Blomström, Lipsey & Zejan, 1992; Borensztein, De Gregorio & Lee, 1998; De Mello, 1999; Alfaro, 2003). A one-dimensional measure of economic development in terms of value income, expenditure or output does not reflect the equity attributes of the economy and may neglect the key aspects of societal welfare. “It would be wrong to conclude a priori that FDI contributes automatically to poverty reduction because FDI raises average growth” (Te Velde & Morrissey, 2004:350). Non-income indicators may play a major role in detecting omitted attributes of welfare in monetary poverty measures (Ravallion, 1996). Secondly, many studies (Agenor, 2002; Mirza, Giroud, Jalilian, Weiss, Freeman & Than, 2003; Calve & Hernandez, 2006; Gohou & Soumaré, 2012; Lehnert et al., 2013) on FDI and poverty have failed to adequately

control for endogeneity, cross-sectional dependence and autocorrelation issues. These may pose serious limitations on statistical inferences and hypothesis testing.

The impact of FDI on welfare is particularly important to examine when viewed from an African perspective. African countries are characterised by higher poverty and inequality rates. FDI has become a complementary element of a broader package of development policies needed to increase employment and enhance societal welfare in Africa. Failure to adequately account for resulting dynamics poses a danger to creating a pattern of FDI-led enclave development. Therefore, a multidimensional approach that employs several welfare indicators in a dynamic framework is vital. This dissertation consists of three interrelated essays that examine how FDI translates into various social welfare functions.

1.3 Research objectives

The broader objective of this study is to examine the FDI-welfare dynamics in Africa. The specific objectives are:

1. Explore the trends and composition of FDI in relation to socio-economic development.
2. Examine the impacts of FDI on poverty (both one-dimensional and multidimensional poverty measures).
3. Evaluate the impact of FDI on disaggregated levels of human development.
4. Analyse if there are any differences on the impact of FDI on human capital development between different income group levels.
5. Investigate the effect of FDI on income inequality.

1.4 Research questions

The study aims to answer the following research questions:

1. What are the effects of FDI on various dimensions of welfare?
2. What are the impacts of FDI on various levels of human capital development?
3. Do middle-income countries do better than lower-income countries in terms of human capital development?
4. What are the effects of FDI on income inequality?

1.5 Chapter organisation and rationale

To address the above objectives, this dissertation follows the structure of three papers. As alluded to earlier, the welfare aspect of economic development is multidimensional in nature and literature is filled with ambiguities on how FDI translates into inclusive and sustainable broad-based development. Assessing FDI and welfare dynamics in Africa does not only allow us to examine how FDI as a policy instrument translates into social welfare functions, but also to reflect on the pace and progress of the MDGs' global development agenda. The study is also timely in the sense that it will help in smoothing the transition towards successful implementation of the global post-2015 development agenda.

In the second chapter, the trends and composition of FDI, economic productivity and social welfare indicators are amplified. It explores both the global and regional trends to provide descriptive insights and builds a foundation for empirical analysis. The first paper is presented in Chapter 3. It examines the general impact of FDI on welfare. It employs several welfare/poverty indicators to examine how FDI as a policy instrument has improved or perhaps worsened economic welfare in Africa. It has been noted earlier that welfare/poverty is a multidimensional phenomenon; therefore this paper will use both one-dimensional and multidimensional welfare indicators to adequately capture the underlying dynamics. According to literature, the optimal efficacy of FDI as policy instrument to address the developmental agenda depends largely on the initial conditions of the underlying economies. The initial conditions include human capital development, income distribution, industrial policies, etc. Therefore, the second paper (Chapter 4) explores the effects of FDI on human capital development. In particular, this paper examines how FDI affects different levels of education, namely primary, secondary and tertiary levels of education. The disaggregated level of education essay has yielded deeper insights on the transmission mechanisms of FDI as Africa strives towards creating a conducive environment that enhances FDI benefits.

Other pertinent challenges of welfare and broad-based development are linked to distributional factors. The concentration of wealth among the most rich has

exacerbated income inequality within the continent. Extreme income inequality has a “tendency to make trade-offs in favour of growth at the expense of the poorest, resulting in a form of weak sustainability” (Gupta et al., 2015:2). Additionally, the new SDGs have explicitly developed a goal that aims to reduce inequality within and among countries. In this regard, the third paper evaluates the effect of FDI on income inequality in Africa. Assessing the impact of FDI on income inequality is important to ensure that Africa’s development agenda and operational targets incorporate the inherent characteristics of the continent.

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CHAPTER 2

FDI AND SOCIO-ECONOMIC DEVELOPMENT IN AFRICA

2.1 Introduction

Social welfare and poverty eradication remain the central focus of the global development agenda. The 2000 MDGs, the new SDGs, and the 2030 agenda call for a robust and consistent approach to evaluate the qualities of human wellbeing. Globally, over 700 million people still live in extreme poverty and are struggling to meet basic needs such as health, education and sanitation. Sub-Saharan Africa and south Asia account for over 70 percent of the global population living below the international poverty line of \$1.25 a day. While south Asia has succeeded in reducing poverty from 52 percent in 1990 to 23 percent in 2011, Africa's poverty has marginally declined from 57 percent in 1990 to 47 percent in 2011 (*MDG Report*, 2015).

Poverty runs across many dimensions and can result from unemployment and the vulnerability of certain populations to disasters, diseases and other phenomena which undermine social wellbeing. Recent development shows that economic development in terms of monetary aggregates is arguably inadequate to capture the multidimensional aspect of welfare (Jahan, 2015). The World Economic Forum for Africa has declared structural transformation as Africa's economic priority (African Development Bank, 2014). There is a great consensus that growth alone has not been good enough to address the current social challenges of the skewed distribution of resources and employment creations. Efforts to implement policy strategies that promote self-reliance, inclusivity and sustainability are fundamental to achieve Africa's developmental agenda.

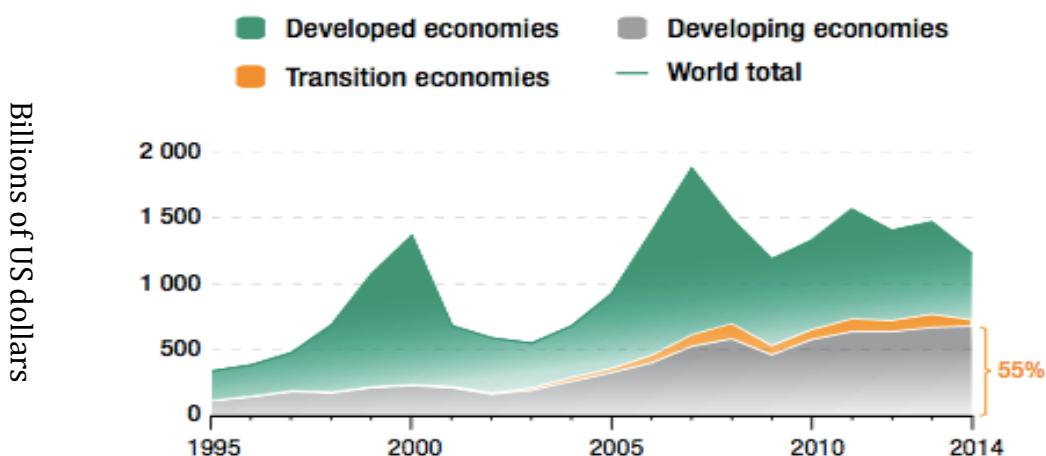
International business scholars view FDI as an important instrument for technology transfer necessary to propel broad-based development. However, the existence and persistence of poverty and social development challenges amidst the increased FDI flows underline the need to address the root cause of the ongoing social concerns. Persistent poverty is detrimental to inclusive growth and can incite social tension. The

failure of policy makers and academia to examine international business activities in relation to socio-economic development links demands more empirical work.

This chapter presents Africa's FDI outlook and how it relates to welfare and inequality patterns. It discusses the key trends, composition and links of FDI vis-à-vis socio-economic development indicators. Understanding the interconnections between FDI and social welfare indicators is important in shaping and contextualising the empirical work needed to draw policy interventions. It is also of importance to both policy makers/governments and international business scholars. Comprehending the depth and incidence of poverty can help governments to create well-tailored policies that address various dimensions of poverty. From an international business perspective, it underpins how to manage global integration with local responsiveness and embrace the envisioned shared values.

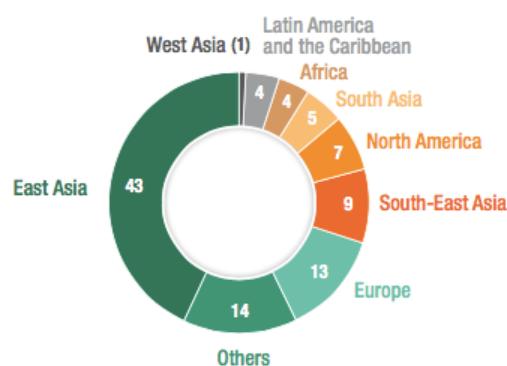
2.2 Global outlook

The global FDI trend is characterised by various cyclical movements. Figure 2.1 reveals episodes of the highest global peak and lowest declines. While there is a general decline in both developed and transition economies, inflows to developing economies maintain an upward trend on average. The contraction in FDI flows is mainly attributed to the general worldwide macroeconomic phenomenon that saw disinvestment in some part of the globe (UNCTAD 2015). Although FDI flows to developing countries show an upward trend, they were mainly influenced by Asia and India.

**Figure 2.1: Global FDI trend**

Source: UNCTAD, 2015

Zooming into Africa, FDI inflows rose from US\$2.4 billion in 1985 to US\$36 billion and US\$53 billion in 2006 and 2007 respectively, but began to fall in 2008 with the onset of the recent financial crisis. The surge in FDI flows was partially attributed to the twin forces of rising commodity prices, as well as a positive investment climate in Africa (UNCTAD 1992; UNCTAD, 2008). These increases were characterised by high inflows towards the primary and services sectors, mainly owing to exploitation of Africa's vast resources and privatisation schemes by many economies. Recent figures indicate that FDI further increased in 2012 to US\$56 billion but contracted in 2013 to US\$54 billion, a position it maintained until the year 2014 (UNCTAD, 2015).

**Figure 2.2: FDI stock by major developing economies and destination by region, 2013**

Source: UNCTAD, 2015

Despite a drop during the last few years, Africa has remained an attractive investment destination throughout the global downturn and has managed to maintain its relative share of global investment flows (UNCTAD, 2010). However, as presented in Figure 2.2, FDI flows to Africa have been relatively low compared with other developing regions. Nonetheless, it is interesting to note that the ratio of its global FDI flows to its share of global output has been relatively constant. Most notably, according to the United Nations Commission for Africa (UNECA), the proportion of FDI on gross capital formation is extremely high compared with other developing countries (UNECA, 2015).

FDI inflows are of critical importance to Africa's development agenda. They have the potential to provide innovative skills and technologies to tackle the challenges of reducing poverty. Moreover, the advent of new technology can create an enabling environment to enhance efficiency and stimulate sustainable employment opportunities.

2.3 Trends and composition of FDI in Africa

Regional inward FDI stock has increased tremendously since the 1990s. Figure 2.3 presents the trend of inward FDI stock as a percentage of Gross Domestic Product (GDP), while Figure 2.4 presents similar measurements with inward FDI flows. West Africa is the main driver of FDI flows to Africa and this is mainly driven by natural resource-rich countries like Nigeria and the recent discovery of oil in Ghana, Gabon, and Côte d'Ivoire that has attracted investment to the region (UNCTAD, 2014).

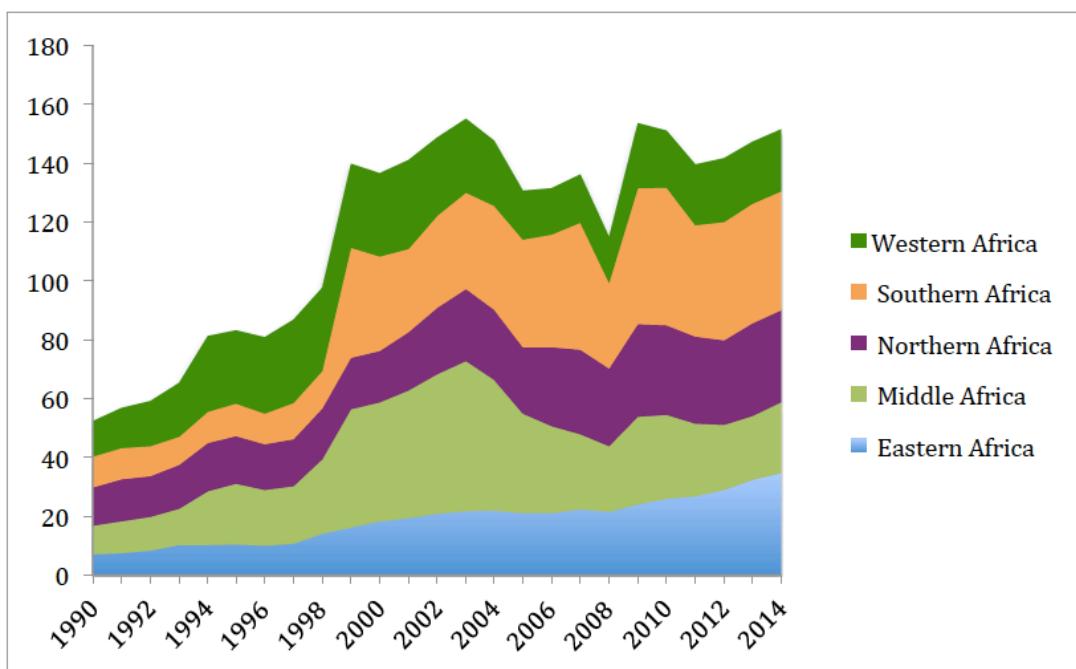


Figure 2.3: Regional inward FDI stock measured as percentage to GDP

Source: Author's computation based on the UNCTAD 2016 online database

The composition of countries are as per UNCTAD (2016) classification given as follows: East Africa (Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Rwanda, Seychelles, Somalia, South Sudan, Uganda, Tanzania, Zambia, and Zimbabwe); Middle Africa (Angola, Cameroon, Central African Republic, Chad, Congo, Democratic Republic of the Congo, Equatorial Guinea, Gabon, and São Tomé and Príncipe); North Africa (Algeria, Egypt, Libya, Morocco, Sudan, Tunisia, and Western Sahara); Southern Africa (Botswana, Lesotho, Namibia, South Africa, and Swaziland); West Africa (Benin, Burkina Faso, Cabo Verde, Côte d'Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Saint Helena, Senegal, Sierra Leone, and Togo).

Inward FDI flows have spiked around the year 1998, 2001 and 2008 respectively. Although increasing on average, several declines/increases were reported after the year 2008. The potential reasons for declines in West Africa's inward FDI could be attributed to the recent Ebola crisis, regional conflicts, and falling commodity prices. The political instability in North Africa has led to a decline in FDI flows due to weaker investor confidence (UNCTAD, 2014). East Africa has gained momentum in

attracting inward FDI flows. This is largely led by discovery of gas in Tanzania and the expansion of the textile sector in Ethiopia.

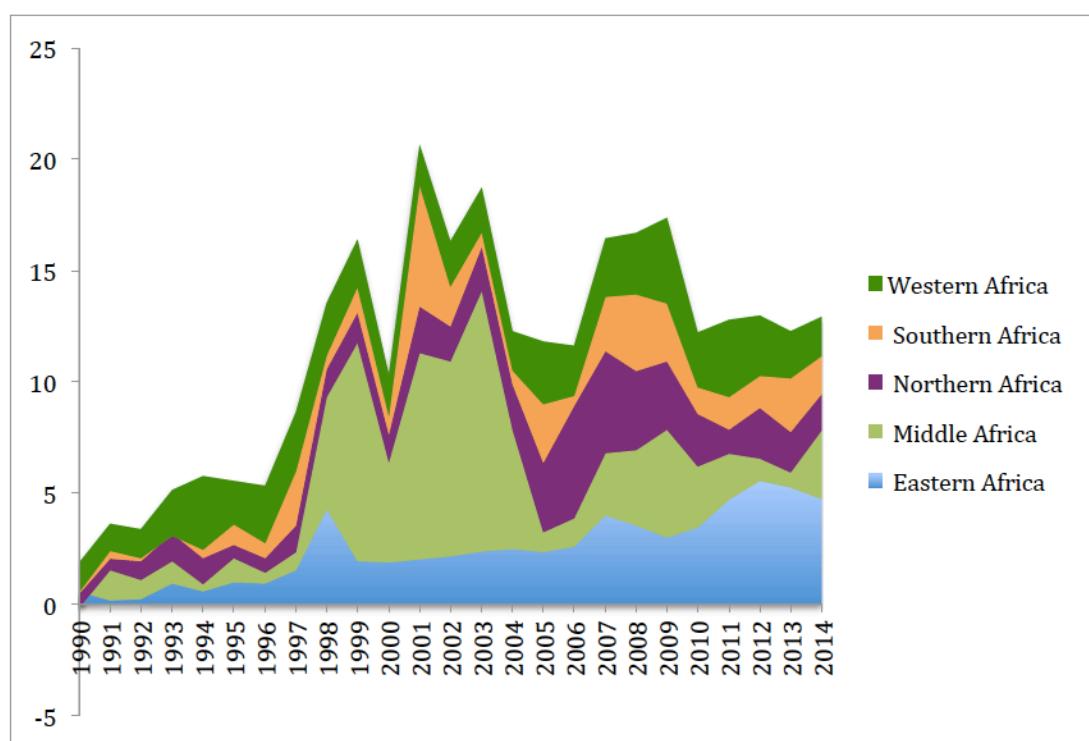


Figure 2.4: Regional inward FDI flows measured as percentage to GDP

Source: Author's computation based on the UNCTAD 2016 online database

The level of inward flows in Middle Africa is also characterised by an upward trend. FDI inflows have increased by 33 percent in 2014. An oil refinery and a hydroelectric plant in the Democratic Republic of Congo (DRC) seem to be among the drivers of the recent trend. From Southern Africa, the magnitude of inward FDI inflows has declined slightly during the past two years. Inward FDI fell by 10 percent in 2014, largely owing to the weakening energy sector (UNCTAD, 2015).

The sectoral composition of inward FDI flows is reported in Figure 2.5. The services sector contributes 48 percent of Africa's FDI flows. The primary and the manufacturing sector contribute 31 and 21 percent respectively. Notably, the share of services in North Africa grew to 61 percent in 2012, with the primary sector contributing marginally by only 4 percent. The share of services is also gaining momentum in sub-Saharan Africa. It accounted for 45 percent in 2012, followed by the primary sector with 35 percent. There has been a remarkable growth in the

services sector. According to the *World Investment Report* (UNCTAD, 2014, 2015), Africa's FDI stock in services has increased four-fold from 2001–2012. Moreover, the greenfield FDI project in Africa is also dominated by services. Overall, FDI in services has increased significantly from 13 percent in 2004 to 63 percent in 2013 (Chen, Geiger & Fu, 2015).

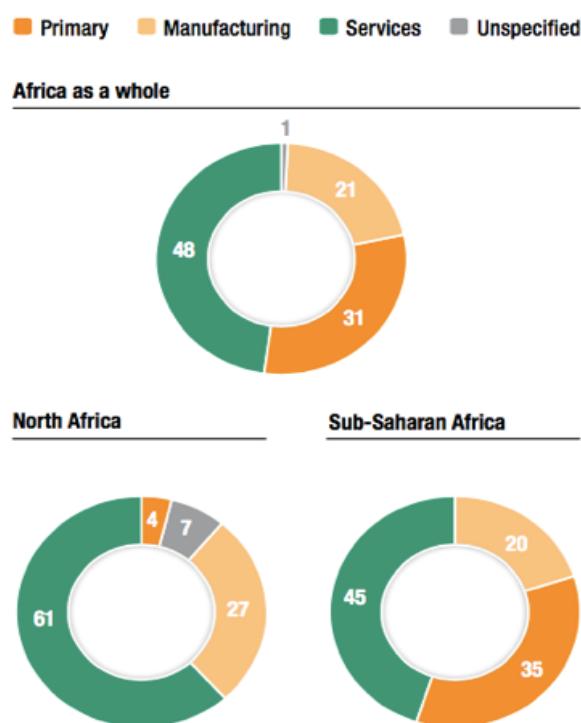


Figure 2.5: Africa's inward FDI stock by sector and sub region

Source: UNCTAD, 2015

Individual economies have however reported mixed patterns. To gain greater insight into individual countries' specific patterns, Figure 2.6 concentrates on the greenfield manufacturing FDI of selected African economies. During the period 2003–2006, resource-rich countries like Nigeria, South Africa, and the DRC were characterised by a larger share of greenfield FDI towards the manufacturing sector. Although countries like Uganda, Ethiopia, and Ghana have received a negligible share of manufacturing FDI, their shares have significantly improved during the period 2007 to 2010, together with Angola and Tanzania. Zambia, the world's third largest producer of copper, has emerged among the top countries between 2011 and 2014. This is mainly driven by government efforts towards infrastructure development, tourism and the agriculture industry (UNCTAD, 2014).

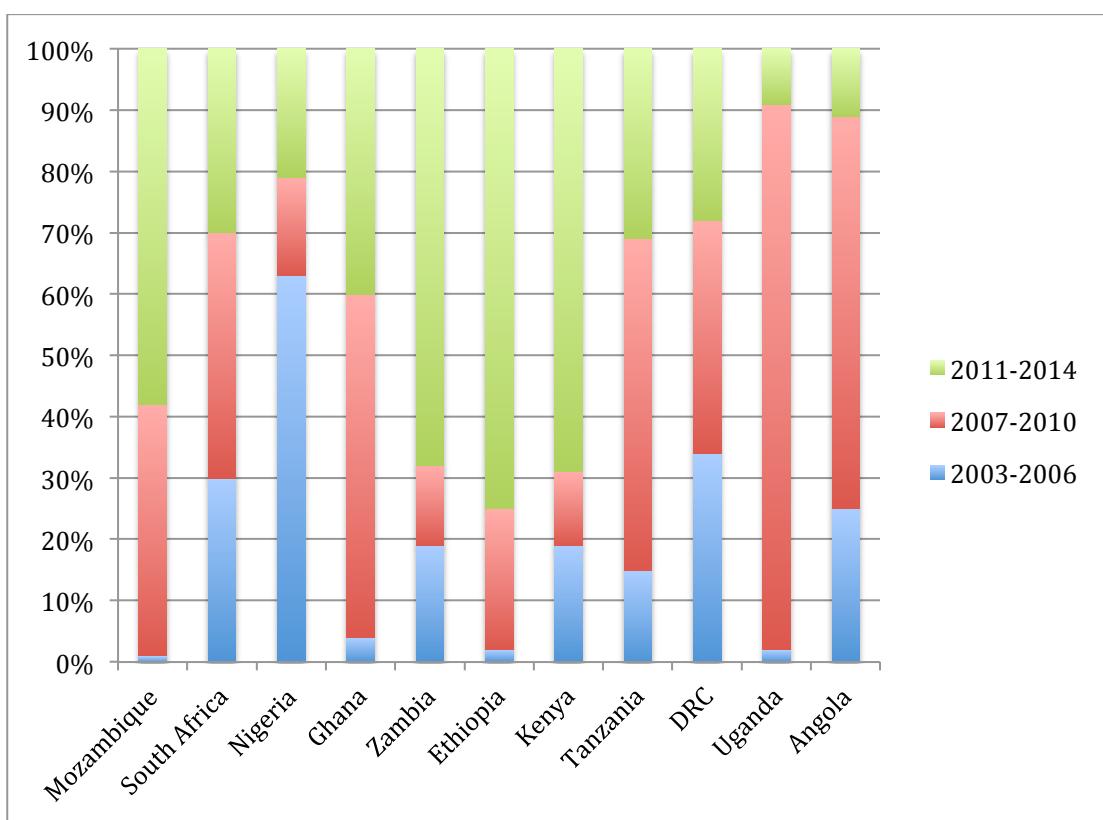


Figure 2.6: Greenfield manufacturing of FDI in selected countries

Source: Author's computation based on the FDI markets database, 2016

Notably, non-resource rich countries like Uganda and Ethiopia have increased the manufacturing sector's contribution from 2007–2010 and 2011–2014 respectively. This boom was attributed to low cost in labour-intensive sectors combined with a conducive business climate in terms of business registration and processes (Chen et al., 2015).

2.4 Trends of social welfare indicators and income inequality in Africa

Overcoming income inequality and reducing poverty remain critical for Africa's transformation process. Africa remains behind in achieving the MDG of halving the level of poverty in 2015. Examining its progress is therefore important to guide the next stage of the post-2015 agenda (*MDG Report*, 2015). The majority of the goals that relate to welfare issues have not been realised. Africa is on track in attaining universal primary education and combating disease. However, it remains off track in attaining four out of seven key critical indicators of socio-economic development.

Moreover, although the inward FDI trend has improved, there exists a weaker link between poverty reduction and investment activities. From 1990 to 2008, Africa's proportion of people living below the poverty line decreased from 47 percent to 40 percent. This is relatively low compared with a decline of 15 percent and 24 percent recorded by Asia and Latin America respectively during the same period (African Development Bank, 2014). Notwithstanding Africa's slow progress in overcoming poverty, there is a great concern that the individual countries are characterised by wide disparities of poverty levels.

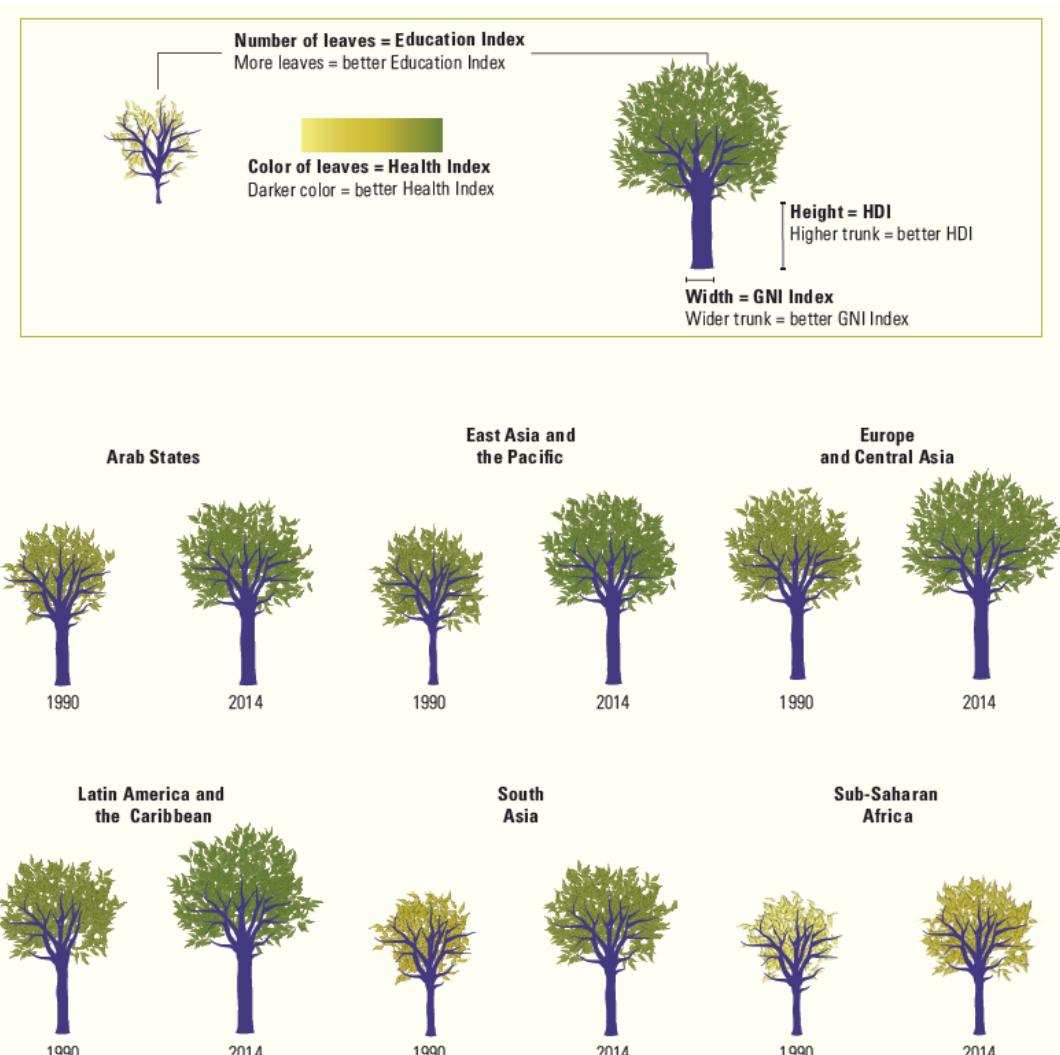


Figure 2.7: Human Development Index indices

Source: Jahan, 2015

Relative to global trends, there is also clear evidence that Africa lags behind in addressing social welfare concerns, particularly on health and better living conditions in terms of income. Figure 2.7 reports that with regard to education, health and income indices, Africa was almost on par with south Asia in 1990, but south Asia appeared more flourishing than Africa by 2014. This reinforces the arguments that Africa's transformation process towards a prosperous industrial nation remains a challenge. However, it is worth noting that Africa's education index has improved by a greater magnitude from 1990 to 2014.

2.4.1 Depth and incidence of poverty

Poverty is generally defined as a multifaceted phenomenon; it goes beyond monetary aggregates, and is often classified as a lack of housing, health, education, security, employment, etc. (World Bank, 2001). In addition to the standard income-based measure, there are various indices that classify different dimensions of poverty. The poverty head count ratio, poverty gap, human development index, and the new Multidimensional Poverty Index (MPI) are some of the indicators that capture various dimensions of poverty.

The MPI is an index designed to measure acute poverty levels. It comprises a composite of 10 indicators (nutrition, child mortality, years of schooling, school attendance, cooking fuel, sanitation, water, electricity, floor, and assets), which capture two key aspects of poverty, namely the proportion/incidence of the population segment subjected to multiple deprivation, and the intensity of the resulting deprivation (Alkire & Santos, 2010; Alkire & Foster, 2011).

Figure 2.8 reports on the MPI, severe MPI, and the intensity of multidimensional poverty for the period 2010 to 2014. The MPI is measured as a percentage of the population that is multidimensionally poor, and severe MPI is measured as a percentage of the population in a severe MPI (those with a deprivation score of 50 percent and more). The intensity is measured as an average percentage of deprivation experienced by people in multidimensional poverty. Regional disparities in various dimensions of poverty are evident in Figure 2.8. Sub-Saharan Africa is characterised by higher multidimensional poverty intensity. North African countries have recorded

very low MPI values; however, they suffer from higher intensity. A severe MPI is almost non-existent in Egypt, Libya, and Tunisia. Despite North Africa's success in reducing poverty to one percent in 2010, poverty intensity remains unresolved. Capturing both the breadth and intensity of poverty offers new perspectives. It underscores the various dimensions of poverty. This indicates that reducing poverty does not necessarily indicate absence of poverty. Sub-Saharan African countries rank high in both MPIs and severe MPIs. While poverty intensity remained relatively modest, the higher level of both MPI and severe MPI confirms the persistence of poverty in the region.

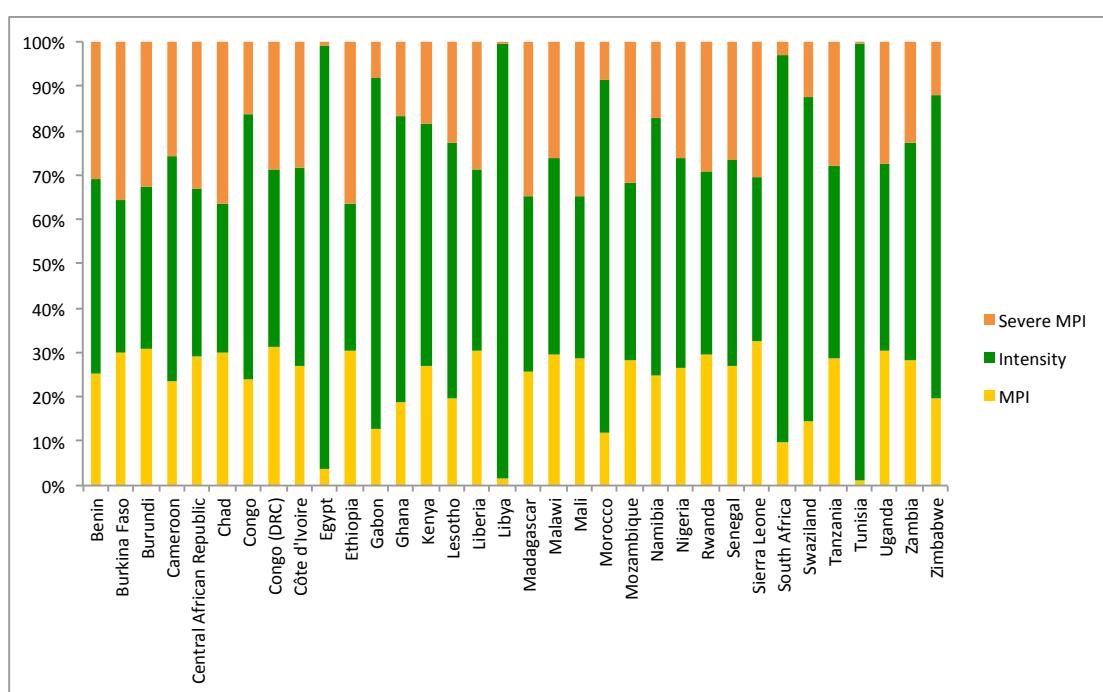


Figure 2.8: MPI, severe MPI and poverty intensity patterns

Source: Author's computation based on the 2016 UNDP online database

In Figure 2.9, the three broad elements of MPI were disaggregated to examine their individual contribution to poverty. In sub-Saharan Africa, living standards contribute to poverty by a greater margin compared with health and education, while North Africa's poverty is dominated by health. The heterogeneity and dynamics within various dimensions of poverty further underscore the need for a comprehensive approach to address welfare issues. The contribution of education to poverty appears to have diminished in many African countries. This is in line with the second MDG.

The youth literacy rate reached 69.61 percent in 2012, in part owing to increased access to universal primary education.

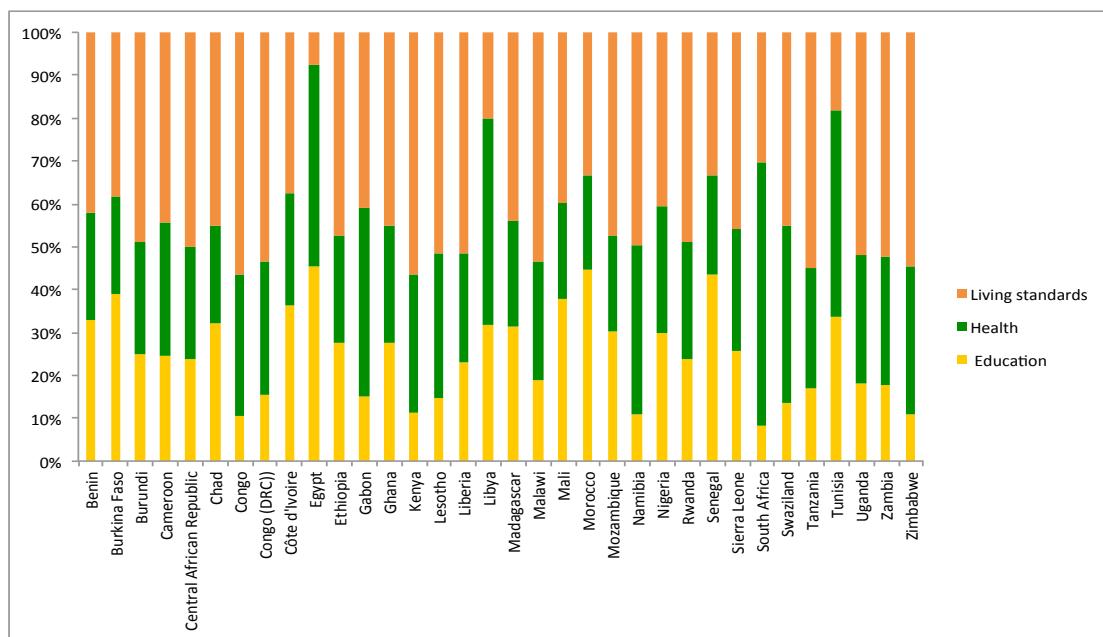


Figure 2.9: Contribution of deprivation in relation to overall poverty

Source: Author's computation based on the 2016 UNDP online database

Figure 2.10 shows the trend of regional poverty levels from 1990 to 2011, measured of population living below US\$1.25 per day. It is startling to note that Africa's population living below the international poverty line increased between 1990 and 2005 before a slight decline in 2008 and 2011 respectively. Nevertheless, there is noticeable change in the poverty incidence measured by the poverty head count ratio as it has been decreasing since 1993, albeit at a slower pace.

Although the overall poverty incidence is declining for Africa, data on sub-Saharan Africa country-specific patterns have recorded mixed patterns. Sub-Saharan Africa is characterised by a higher level of poverty when compared with world standards. According to current statistics, general poverty levels have declined from about 57 percent in 1990 to 48 percent in 2010 in sub-Saharan Africa (*MDG Report, 2015*). This is considerably below the MDG target rate of 28 percent.

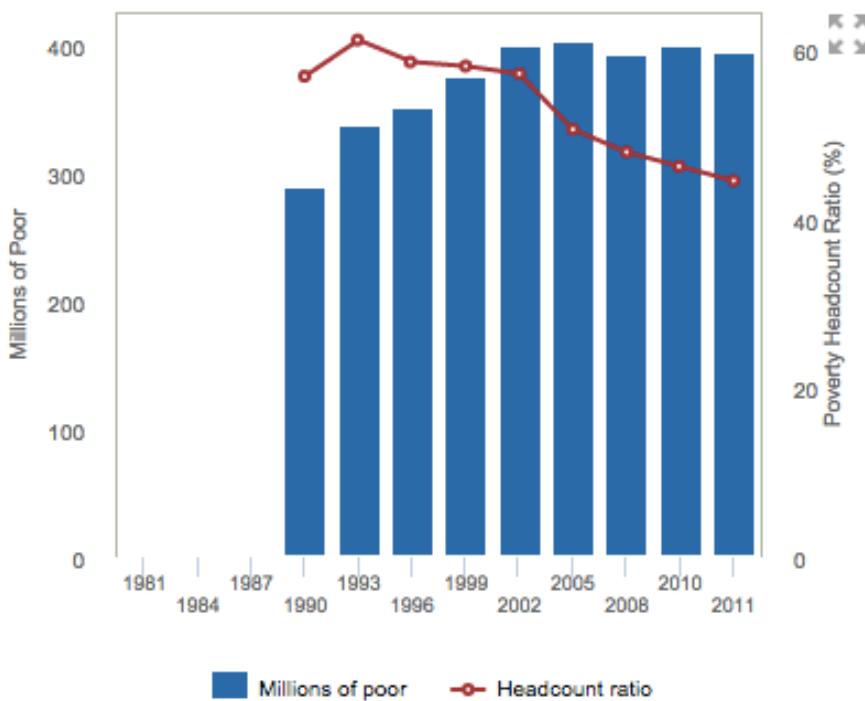


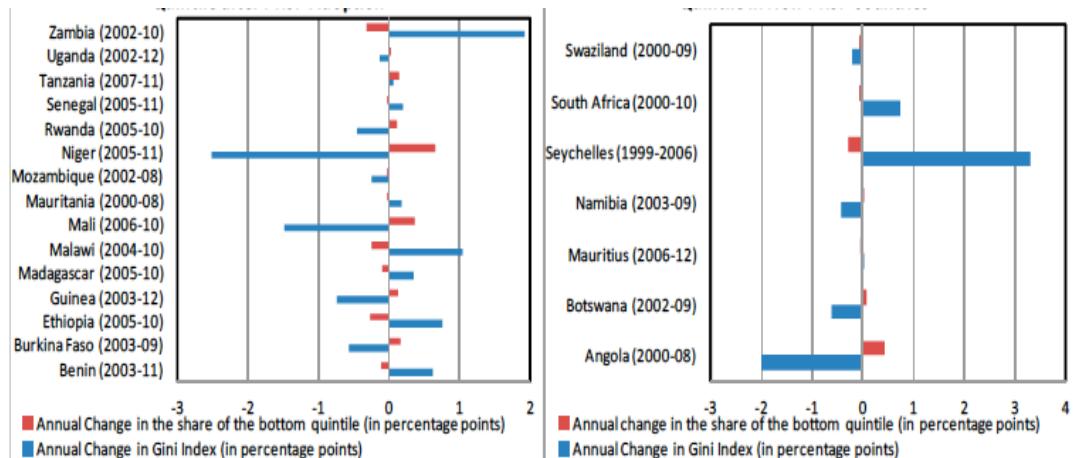
Figure 2.10: Total regional poverty trend

Source: World Bank Poverty and Equity interactive database 2016

2.4.2 Income inequality

The issue of income inequality is of critical concern to Africa's developmental agendas. Literature reports that Africa is overburdened with high and persistent income inequality (Chen & Ravallion, 2012; Ravallion, 2012). A high level of income inequality is said to weaken the regional development policies.

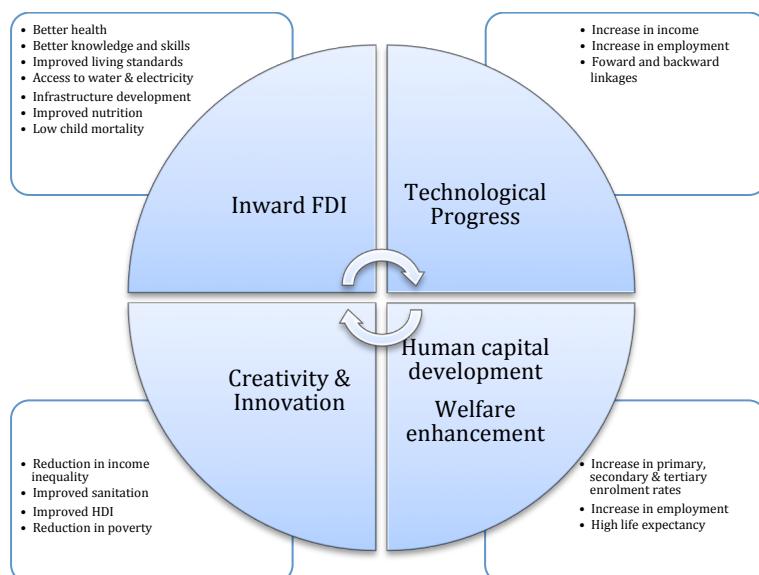
Figure 2.11 further reports on the annual change in the share of the bottom quintile and annual change in the Gini index. While most of the countries have reported a decline in their Gini coefficient index, countries like South Africa, Seychelles, Zambia, Malawi, and Ethiopia are characterised by worsening levels of inequality. Similarly, the annual change in the share of the bottom quintile has reduced for Zambia, Mali, Ethiopia, and Seychelles. During the years 2005–2011, Niger recorded the highest reduction in the Gini coefficient index, as well as the highest increase in the annual change in the share of the bottom quintile. Countries like Mali, Guinea, and Angola have also reported a fair decline in the Gini coefficient of about 1.5, 0.7 and 2 percent respectively.

**Figure 2.11 Income inequality trends**

Source: World Bank Poverty and Equity database 2014

It is evident that poverty and social inequity pose developmental challenges to Africa. Moreover, there is a growing debate that FDI could directly lead to poverty reduction through employment creation, human capital development, higher productivity and wages. A rigorous empirical study that examines the potential linkages between FDI, welfare and inequality is therefore important, given the growing concerns of universal human development issues in Africa.

2.5 FDI and social development analytical links

**Figure 2.12: Infographic links between FDI and social development**

Source: Author's design

From a theoretical perspective (Findlay, 1978; Lukas, 1988; Romer, 1990; Rebelo, 1991), FDI has a broader scope in enhancing social welfare. FDI improves technological progress, human capital and creativity, as well as innovations that will ultimately stimulate broad-based development. FDI also provides education, living standards and health benefits that are essential for social cohesion. Improving human capital and infrastructure may contribute to attracting more FDI; hence, FDI and social welfare development could be mutually reinforcing.

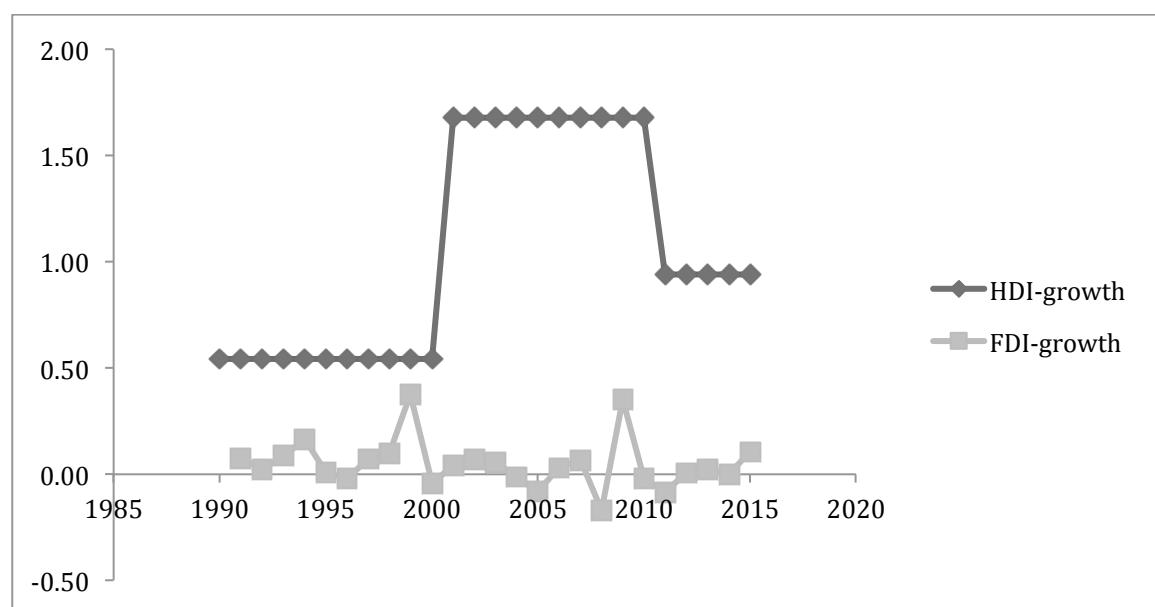


Figure 2.13: Percentage of FDI to GDP ratio and HDI line plot

Source : Author's computation based on 2016 World Bank & UNDP databases

Figure 2.13 reports a relation between FDI growth measured as percentage of GDP and HDI growth for Africa from 1990–2015. A peak of FDI growth around the year 1999 is associated with a corresponding peak in HDI growth. Consequently a decline in FDI growth around the year 2008 has led to a corresponding fall in HDI growth. There exists a positive relationship that appears with a time lag. The fall in FDI could be attributed to the year 2000 Asian financial crisis and the 2008 global financial crisis.

Figure 2.14 uses aggregated annual figures to presents scatter plots between secondary and tertiary gross enrolment rates, under-5 child mortality rates and the percentage of population with improved sanitation in relation to the FDI ratio to GDP.

Both the tertiary education gross enrolment rate and improved sanitation exhibit a positive correlation with FDI activities. The infant mortality rate reveals a negative relation as expected. These are in line with theoretical expositions of improving health, education and standard of living. However, there appears to be a weak correlation between secondary education gross enrolment rates and FDI activities.

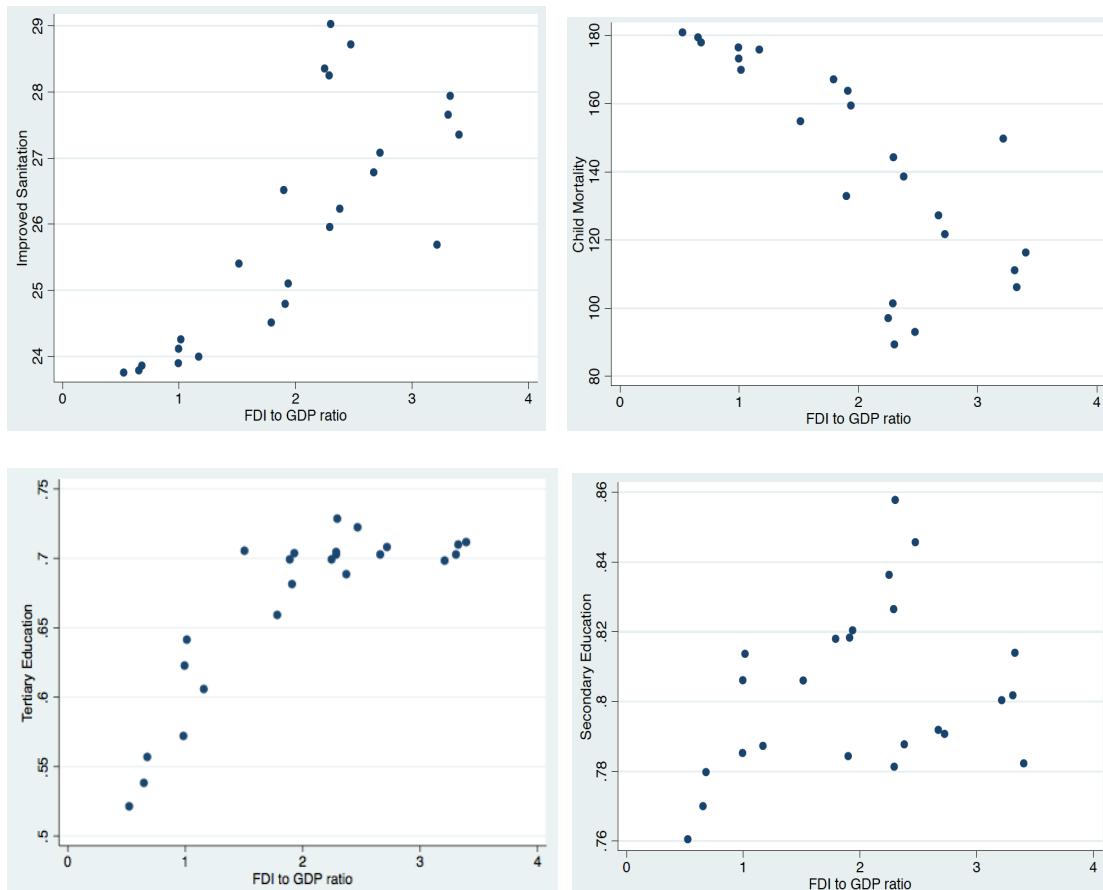


Figure 2.14: Scatter plots for FDI and selected welfare indicators in Africa (1990–2013)

Source: Author's computation based on 2016 UNCTAD, UNDP & UNESCO online databases

From a correlation perspective, international business appears to have a positive association with the majority of the indices/indicators that have been employed. This indicates that inward FDI is proportionately linked to improvement in welfare indicators. However, correlation alone does not always imply a causal effect. An

empirical exploration is therefore needed to adequately examine the underlying relations.

2.6 Conclusion and policy implications

This paper amplifies the stylised facts of FDI and social development indicators in Africa. Despite global imbalances, international business in terms of FDI flows has increased rapidly, signalling a major shift from the structure of the early nineteenth century. Notwithstanding this conspicuous pattern, the majority of Africa's population suffers from various dimensions of poverty. It is indistinct if, and how fast, Africa's industrial policy is transforming the continent towards broad-based development. Emerging empirical analysis on international business models is therefore needed to adequately address the multifaceted nature of social welfare.

The multidimensional poverty indices have unfolded important findings. Severe multidimensional poverty is predominant in sub-Saharan Africa. Poor living standards and health issues largely drive poverty in sub-Saharan Africa. North Africa has managed to reduce poverty levels, but it suffers from higher poverty intensity. Poor health conditions have contributed largely to higher poverty intensity in North Africa, while poverty arising from poor living standards is almost non-existent.

Inequality trends indicate that most countries have either worsened or reported a sluggish decrease in inequality when compared with nineteenth-century levels. The issues of income inequality and poverty reduction in Africa are now becoming a global issue. Given the post-2015 agenda evolution, there is a clear need for fundamental change on how to implement and evaluate developmental policy strategies. Both the 2030 agenda and the new SDGs call for fair development policies that tackle inequality and all dimensions of poverty. This is evidently embedded in SDG1.2 as it aims to support the global call by explicitly addressing the multidimensional aspect of poverty. Policy implications from this study reveal that poverty occurs in various forms and that there are various dimensions that contribute to it. Beyond simply aggregated measures, Africa needs to identify various dimensions and sources of poverty. Moreover, a greater roadmap towards SDGs is essential for the much-needed fundamental change.

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CHAPTER 3

FDI AND WELFARE DYNAMICS IN AFRICA¹

3.1 Introduction

The *MDG Report* (2015) divulges that sub-Saharan Africa has managed to reduce poverty from 56.5 percent in 1990 to 48.4 percent in 2010. Although poverty has declined, the slow pace of poverty reduction has raised concerns about real risk reversal from current shocks and volatile global markets. According to the African Development Bank (2014), Africa has recorded a positive growth that is on average five percent above the global average of three percent since 2001. However, reducing poverty by half remains a challenge.

Extractive industries (minerals, oil and gas) that are predominantly characterised by FDI have been the main drivers of Africa's growth. It should be noted that although international business has been influential in promoting Africa's positive economic growth, its linkage with social welfare indicators is not well established in Africa. Understanding how international business activities translate into social welfare functions can provide useful insight into its developmental impact and also identify opportunities for mutual benefits. In this context, analysing the impact of international business activities on social welfare functions becomes crucial for Africa.

This paper tests the welfare impact of FDI in Africa. FDI is employed by many economies as a strategy towards attaining some of the MDGs (World Bank, 1997; IMF, 1999; Overseas Development Institute, 2004; UNCTAD, 2005). Nonetheless, the extent to which FDI enhances welfare, and subsequently reduces poverty, has not been studied extensively, especially in Africa. Two studies, Gohou and Soumaré (2012) and Soumaré (2015), have examined the effect of FDI on welfare in sub-Saharan Africa and North Africa respectively. Neither study explored all the measures of welfare. This paper builds on Gohou and Soumaré (2012) and Soumaré

¹ This paper has benefited from comments and suggestions from participants at the 11th African Finance Journal Conference in Durban. The paper is also currently under review for publication in a journal.

(2015) by firstly exploring other purely non-monetary welfare indicators in addition to the HDI and GDP per capita dimensions. Secondly, the essay is the first to estimate the turning points and examine the marginal effects at which inward FDI stock begins to lead to a rise/fall in welfare gains/losses. Estimating the turning point is important in guiding practicable policy interventions to enhance welfare gains. Africa's poverty level is high when compared with other developing regions; it is therefore important to examine various dimensions of welfare and identify the turning points to enable well-guided policy responses.

It is imperative to note that poverty is a multidimensional phenomenon. However, the framework in current literature is dominated by one-dimensional or monetary measures (Blomström et al., 1992; Borensztein et al., 1998; De Mello, 1999; Alfaro, 2003; Whalley & Weisbrod, 2012; Almfraji, Almsafir & Yao, 2014; Shamim, Azeem & Naqvi, 2014; Ucal, 2014; Agarwal & Atri, 2015). A one-dimensional measure of economic development does not reflect the equity attributes of the economy and may neglect the key aspects of societal welfare. Societal welfare is embedded in a broader goal of economic development and is complex and multidimensional in nature. As noted by Te Velde and Morrissey (2004:350), "It would be wrong to conclude a priori that FDI contributes automatically to poverty reduction because FDI raises average growth." Non-income indicators may play a major role in detecting omitted attributes of welfare in monetary poverty measures (Ravallion, 1996).

This study is novel in a number of ways: firstly, both the linear and non-linear effects of FDI were captured; secondly, more robust methodological approaches that safeguard cross-sectional dependency, endogeneity and heterogeneity were used; and thirdly, a uniquely African countries' sample was concentrated on. In addition, the issue of multifactor measures, as well as the capturing of monetary and non-monetary welfare indicators, is addressed. It shows that failure to capture the multidimensional welfare effects of FDI masks the dynamic impact of FDI on welfare. The literature is further extended by going beyond the non-monetary welfare effects of FDI to test FDI effects on human development and child health. This is important because welfare indicators such GDP per capita and HDI could be inflated by monetary dimensions that fail to account adequately for the non-monetary aspect.

It is important to put in perspective that FDI flows to Africa have risen substantially from the mid-1980s. For instance, FDI rose from US\$2.4 billion in 1985 to US\$36 billion, US\$53 billion and US\$246.4 billion in 2006, 2007 and 2012 respectively (UNCTAD, 2014). However, it is unclear whether the FDI has enhanced economic development, reduced poverty, and induced welfare gains in Africa. In this paper, therefore, the first step is taken to examine the link between FDI and welfare in Africa.

Theoretical literature on FDI and poverty is not without ambiguities. The proponents of FDI contend that FDI has the potential to alleviate poverty through employment creation, human capital development, an increase in income, and inequality reduction (Dunning, 1977; Mankiw, Romer & Weil, 1992; Hansen & Rand, 2006). Contrary to these propositions, Hymer (1968a), Moran (1999) and Stiglitz (2002) theorise that FDI is prone to market imperfections and unequal bargaining power that may elevate inequality and impede welfare enhancement strategies. It appears that whether FDI leads to welfare enhancement or not, depends on the nature and extent of the spillover effect and the veracity of this can only be ascertained with further empirical work.

Other studies (Xu, 2000; Elmawazini, 2008; Elmawazini, Atallah, Nwankwo & Dissou, 2013) focus on technological progress/diffusion, quality of institution (Cleeve, 2012) and corporate social responsibility (Nyuur et al., 2016). However, a higher technological progress/diffusion does not necessarily translate into welfare gains. Similarly, links from institutional quality may not adequately capture the multidimensional phenomenon of poverty. The concept of Corporate Social Responsibility (CSR) is well aligned to social welfare indicators; however, it has also been criticised as an insufficient measure, particularly in respect of cross-country studies, because ranking of priorities may differ from country to country (Visser, 2005).

Therefore, in this paper the aim is to examine the impact and turning points of FDI on poverty in Africa within a multidimensional approach that employs non-monetary measures of welfare indicators. The paper contributes uniquely to the literature as it uses robust and rigorous econometric methods to identify the turning points and

marginal effects of the FDI poverty link within a multidimensional poverty framework.

In the remainder of this paper, the literature review, stylised facts of FDI and poverty in Africa, methodology and interpretation of regression results, and conclusion and policy implications of the research are elaborated upon.

3.2 Literature review

Theoretical arguments on FDI and welfare dynamics are explained within the framework of neoclassical or endogenous growth theory. The orthodox economic growth theories are of the view that welfare benefits are attained via an increase in economic growth and productivity. The proponents (Solow, 1956; Koopmans, 1965; Lucas, 1988; Romer, 1990) of this channel argue that an increase in national income has the potential to benefit the poorest income quintile, especially for inequality neutral economies.

The neoclassical model of economic growth developed from the works of Solow (1956, 1957), Swan (1956), Cass (1965) and Koopmans (1965). However, the key contribution was the work done by Solow in 1956 to develop a growth model with a different vintage of capital. The main contribution of these theories is that the economy will always converge towards a steady state rate of growth, which depends only on the rate of technological progress and the rate of labour force growth. Limitations of the model include its failure to explain the long-run rate of growth, knowledge accumulation, and strength of institutions.

In the 1980s the limitation of the neo-classical growth theory in explaining long-run growth led to the introduction of the new growth theory, also termed endogenous growth theory. Within the framework of endogenous growth theory, human capital was modelled as a factor of long-run growth. Among the first main new growth theories is that of Romer (1986), which looks at non-decreasing returns to scale of capital. However, the popular theorists are Lucas (1988) and Romer (1990), where the rate of technological progress is endogenously determined. Romer (1990) argued that

the source of endogenous growth arises from the existence of constant marginal returns to technology accumulation and positive research innovations.

The key contribution of the endogenous growth theory has been to reinvigorate and investigate the determinants of the long-term growth path. However the theoretical differences within new growth theories are not always clearly distinguishable in empirical analysis. Nevertheless, both theories have different views on human capital. Romer's (1990) models can be viewed as complementing the views of Lucas (1988), in the sense that while human capital facilitates technological development, it remains in the model as a factor of production. Therefore, according to endogenous growth theories, it can be inferred that foreign direct investment can stimulate economic growth via technological diffusion and knowledge spillover.

In addition to the orthodox growth theories, international trade theories offer various predictions on the impact of FDI on welfare. The proponents of FDI (Dunning, 1977; Findlay, 1978; Mankiw et al., 1992; World Bank, 1993; Hansen & Rand, 2006) argue that there is a direct and indirect link between FDI and welfare. In line with endogenous growth theories, FDI could affect welfare directly through labour markets in terms of employment creation and human capital development. The indirect link between FDI and welfare enhancement could result from increased economic activities and productivity.

The labour market theoretical linkage between FDI and welfare is explained by Mirza et al. (2003), where welfare is modelled to arise from poverty, unemployment and poor human capital; i.e. $\text{poverty} = f(L, NL, H)$, where L, NL and H denote returns to unskilled labour assets, returns to non-labour assets, and returns from human capital respectively.

Based on Mirza et al. (2003), FDI will impact on poverty through the dynamics in the labour markets and human capital. The return to unskilled labour force ($L = 0$) when an individual is unemployed. In the limits, as L approaches 0, poverty increases. Put differently, an increase in L will lead to a reduction in poverty rates. Movements in L are mainly driven by changes in employment and labour productivity. Therefore, FDI will reduce poverty if it increases unskilled labour and productivity. Similarly, an

increase in H lowers the poverty rate. FDI will increase H via training and knowledge transfer. MNCs have the potential to engage in formal or informal training programmes for their labour force. Moreover, they introduce advanced technology that induces human development and labour productivity.

In the same vein, the eclectic paradigm of FDI theorises that the impact of FDI on welfare is mainly influenced by the inherent features of MNC strategies (market, efficiency or resource seeking), as well as the ability of the recipient economy to assimilate and implement MNC activities (Dunning, 1977). Efficiency-seeking FDI is more likely to increase employment and stimulate labour productivity through technological diffusion. Consequently, it will create sufficient spillovers and linkages (backwards and forwards) with the domestic economy. This could help African countries to address their developmental agenda and attain welfare enhancement.

Lesher and Miroudot (2008) explain the channels through which spillovers and linkages could be attained. They report that FDI spillovers could arise via horizontal, vertical and backward linkages. Horizontal spillover is said to occur when an increase in domestic firm productivity is attributed to the presence of a foreign enterprise within the same industry. On the other hand, forward linkages are realised within the upstream sectors, i.e. domestic firm productivity arising from the presence of a foreign entity in a group of its suppliers. Backward linkages are said to occur through downstream sectors when domestic firm productivity is attributed to the presence of a foreign enterprise among its customers within the same sector (Lesher & Miroudot, 2008).

Therefore, the resulting increase in productivity will lead to an increase in employment, improve skills via labour mobility, and subsequently lead to a decline in poverty (Gohou & Soumaré, 2012). However, resources seeking FDI are presumed to exhibit minimal linkages with host economies. They are likely to crowd out domestic firms so that the resulting cost outweighs the benefits. In this case, the spillover and linkages explained above may not be realised. Hence, a welfare enhancement hypothesis may not hold (Hymer, 1968; Moran, 1999).

Moreover, spillover effects are presumed to enhance the ability of the recipient economy to assimilate and implement MNC activities through imitation effects and subsequently knowledge accumulation (Carr et al., 2001). Theory predicts that MNCs bring technology that could generate imitation effects from local entrepreneurs and diffuse into domestic industries. This is said to occur when local firms are able to imitate and produce goods, or provide services that are similar to those of their foreign counterparts, or by adopting a more efficient foreign technology (Dollar & Kraay, 2000; Klein et al., 2001; Meyer & Sinani, 2009; Lehnert et al., 2013). However, critics argue that an imitation effect will be realised only if the recipient economies have the capacity and ability to comprehend foreign activities (Campos & Kinoshita, 2002; Carkovic & Levine, 2002; Blomström & Kokko, 2003). Therefore, FDI activities may generate competition effects. The notion of competition effects is said to occur when FDI crowds out employment in domestic industries (Markusen & Venables, 1999). Spillovers may also generate skill-biased development that exacerbates inequality and hinders poverty-reduction policies.

Knowledge accumulation/spillover has the potential to endanger allocative efficiency and good business practices that enhance broad-based development. In this light, it can therefore be argued that knowledge spillover will be realised if local firms are able to imitate and produce goods or provide services that are similar to those of their foreign counterparts or by adopting a more efficient foreign technology. However, the imitation spillover will be realised only if the recipient economies have the capacity and ability to comprehend MNC activities.

The theoretical views on the link between FDI and welfare are also explained by the conservative and liberal perspectives on poverty. The conservative theory is based on Friedman's (1962) view that MNCs exist mainly for profit motives and not to address social issues. Poverty reduction is viewed as the sole responsibility of policy makers. This perspective contends that the link between poverty and FDI may not hold. It further argues that promoting corporate social responsibility will serve as a disincentive to MNCs. The loss in incentives to invest could lead to investment withdrawals and ultimately an increase in poverty (Ollong, 2015).

On the contrary, liberal theory views welfare to be closely linked to the ideologies of the market economy. This perspective sees welfare as a product of an interaction between MNCs and the economic process. Poverty is viewed as a result of interlinkages between global socio-economic and internal factors. Therefore FDI could play an important role in shaping the direction of socio-economic policies and reducing poverty (Ollong, 2015).

The framework underlying the benefits of FDI has been subject to great empirical controversies. These controversies revolve around the influences of FDI on recipient countries' economic growth/welfare in a possibly positive or negative manner. Early empirical literature on FDI that supports the growth-enhancing hypothesis features the widely cited work of Borensztein et al. (1998); Blomström et al. (1992); Campos and Kinoshita (2002); Balasubramanyam et al. (1996); Nair-Reichert and Weinhold (2001); De Mello (1999) and Li and Liu (2005), among others. Borensztein et al. (1998) emphasised the role of human capital and technological spillovers as the main determinant of a long-run growth path. However, they argued that the benefits of FDI would be realised when the recipient economies had attained a minimum threshold stock of human capital. This suggests that countries with a low level of human capital tend to exhibit negative effects. Blomström et al. (1992) emphasised the threshold level of income below which the benefits may be limited or absent.

The second strand of literature that offers less support for the positive spillover hypothesis includes the works of Alfaro (2003); Blomström and Kokko (2003); Mwilima (2003); Akinlo (2004), and Fedderke and Romm (2005). Alfaro (2003) concluded that FDI exerts ambiguous effects on growth, while FDI inflows to the primary sector exhibited negative effects (this finding is also supported by Akinlo, 2004). Mwilima (2003) and Blomström and Kokko (2003) tackled the issue of fiscal incentives, arguing that incentives provided by most developing countries outweigh FDI benefits. They further stated that benefits from FDI do not accrue automatically but require vibrant local industries that have the ability and capacity to absorb foreign technologies and skills that may be lacking in most developing countries.

The other stream of research that is more in line with this study revolves around poverty dynamics in a broader view. They implemented multidimensional indicators

to examine the gains/loses arising from FDI. This was attributed to the reasoning that poverty is multidimensional in nature; hence a one-dimensional approach implemented by the majority of the earlier researchers does not adequately capture the net impacts of FDI.

Empirical literature that address poverty issues is also filled with conflicting predictions on the impact of FDI. While Lehnert, Benmamoun & Zhao (2013), Gohou and Soumaré (2012), Dollar and Kraay (2000) and Klein et al. (2001) support the poverty reduction hypothesis, Kosack and Tobin (2006) dismiss the poverty reduction hypothesis and argue that FDI lowers the rate of human development in most less developed economies. Similarly, Agarwal and Atri (2015) tested a FDI poverty reduction hypothesis in India and other South Asian Association for Regional Cooperation (SAARC) countries by using both FDI inflows and outflows. They employed two poverty indicators, namely a head count ratio and poverty gap index. Their findings report that FDI inflows have increased poverty in India, while the outflows have resulted from a fall in poverty. However, other SAARC countries have supported the poverty reduction hypothesis from FDI inflows. Other studies have reported mixed results (Calvo & Hernandez, 2006). In the same vein, Feenstra and Hanson (1997) and Te Velde and Morrissey (2004) share some insights on the distribution aspect of FDI. They report that FDI tends to induce employment bias towards skilled labour. This implies that the poor are less likely to benefit from the resulting increase in employment.

In line with other related studies, Xu (2000) examined the impact of Multinational Enterprises (MNEs) on technology diffusion between developing countries (DCs) and least developing countries (LDCs). The findings report that MNE activities have led to an increase in productivity growth in DCs. This positive linkage was however absent for LDCs. Xu (2000) further argues that the absence of positive links between MNE activities and LDC productivity growth might be attributed to poor human capital that is often a characteristic of LDCs. The novelty of Xu's (2000) research is that he went beyond the traditional approaches by criticising previous studies that employed poor proxies. Xu (2000) postulates that FDI might be a poor proxy to explain the magnitude of economic activity. Hence, he used technology transfer of

MNE activities to examine how MNE activities affect productivity growth of host economies.

In the same vein, Elmawazini (2008) extended the debate on technology transfer by introducing a broader measure. He argues that although the proxy used by Xu (2000) may be regarded as a better measure, it has failed to incorporate research and development expenditure for MNEs. After controlling research and development expenditure, there is supporting evidence that technology diffusion arising from MNE activities has prompted the productivity growth in both developing and developed countries.

Whalley and Weisbrod (2012) investigated the effect of Chinese FDI on selected African countries by focusing on three years before the 2008 financial crisis. They report that although Chinese-based FDI to Africa has increased its impact on growth, it was mainly limited to Nigeria, Niger, Sudan, and Zambia. Other countries report no significant link between Chinese inward FDIs and growth.

In search of an improved approach to capture the effect of FDI activities, Elmawazini et al. (2013) extended the MNE and technology diffusion debates by incorporating host economies' human development. They employed the HDI to measure absorptive capacity and research and development spending to represent technological diffusion. Elmawazini et al. (2013) criticised studies that employed general measures in forms of average years of schooling, citing that they were limited in capturing the absorptive capacity of recipient countries. To better capture the effect of MNE activities on absorptive capacity, Elmawazini et al. (2013) employed the HDI of 30 developed and developing countries for the period 1966–2000. The study reports that the links between technology diffusion and MNE activities are more prominent when the host economy has attained a minimum level of human capital development. Therefore, technological spillover is higher for DCs and a weaker link is reported for developing countries.

From a micro-level perspective, Amankwah-Amoah (2014) studied the organisational expansion to underserved markets in Africa and uncovered that the competitive pressure from international business has increased exploratory activities of African

firms. Furthermore, the study reports that African firms' exploitation activities are mainly influenced by firm-specific factors, as well as institutional factors.

Recently, Nyuur et al. (2016) examined the impact of FDI inflows on domestic firms' uptake of CSR activities by focusing on the moderating effects and host institutions. The study employed hierarchical regression analysis of data from a sample of 227 local firms in Ghana. Notably, the findings report that FDI has played a prominent role in enhancing CSR in Ghana. Moreover, the study found a strong positive link between host economies' institutions' quality and their willingness to uptake CSR activities. The reported strong linkages are, however, absent when the host economies are characterised by high quality and efficient institutions. This is in line with Cleeve (2012), who examined the political and institutional impediments to FDI inflows into sub-Saharan Africa. The findings indicate that institutions play an important role in attracting FDIs to the region.

While studies conducted by Xu (2000), Elmawazini (2008), and Elmawazini et al. (2013) focus more on technological productivity/diffusion, Perri and Peruffo (2016) took a different view by examining the effect of FDI on knowledge-based spillover through a critical literature review focusing on the international business perspective. The review concludes that most micro-level studies found foreign subsidiaries to be the main determinant of knowledge spillover. The review further proposes areas for future research. It suggests that the magnitude, speed and scope of FDI knowledge spillovers need to be the central focus of future research to unlock the underlying dynamics.

It is evident that empirical literature on FDI has evolved from growth, to technological productivity/diffusion, to institutions, and to corporate social responsibility, etc., over the past decades. However, there is a new paradigm shift that directly examines the effects of international business on social welfare functions. Empirical literature that uniquely focuses on FDI and welfare issues is classified into three broad levels of discussion. One, those who support the poverty reduction hypothesis; two, those who contradict the poverty reduction hypothesis, and three, those who found mixed results.

The poverty reduction hypothesis is supported by Mirza et al. (2003); Lehnert et al. (2013); Soumaré (2015); Gohou & Soumaré (2012) and Klein et al. (2001). Mirza et al. (2003) examined the impact of FDI on poverty for five Association of Southeast Asian Nations (ASEAN) countries. They reported that for every dollar increase in FDI, it was associated with 32 cents decline in poverty.² This effect was further decomposed into a direct and indirect channel. The direct poverty-reducing channel accounted for 60 percent, while the indirect channel (via economic growth) accounted for 40 percent. These benefits were realised through employment and labour training. Lehnert et al. (2013) performed a cross-country analysis on the impact of FDI on welfare and knowledge infrastructure in recipient economies. Their main findings show that there is strong evidence that FDI is welfare enhancing. These findings accord with those of Gohou and Soumaré (2012) and Klein et al. (2001), who further report that FDI is found to be more welfare enhancing in poor countries when compared with wealthier countries, albeit with significant regional differences.

The second stream of literature contradicts the poverty reduction hypothesis (Feenstra & Hanson, 1996, 1997; Agénor, 2002; Easterly, 2004; Milanovic, 2005; Chintrakarn et al., 2012). These authors concluded that FDI is associated with an increase in relative wage and employment of skilled labour. The skill-biased outcome may promote wage inequality and hinder welfare-enhancing policies. However, Te Velde and Morrissey (2004) did not find supporting evidence that FDI reduced wage inequality in five ASEAN countries; however, there was supporting evidence that FDI increased inequality in Thailand.

The third strand of literature offers mixed support on the impact of FDI on poverty (Calvo & Hernandez, 2006; Ma & Zhang, 2009). The authors argue that the impact of FDI differs across countries and evidence of welfare enhancement may occur under certain circumstances and may be absent in others. FDI benefits are presumed to be more welfare-enhancing when there are substantial backward linkages with local industries. This will lead to a rise in productivity of local firms and consequently an increase in wage and employment rates. Conversely, limited backward linkages are reported to cause a welfare loss (Markusen & Venables, 1999). This finding is further

² Poverty is measured as average income of the lowest 20% quintile and by an average Gini coefficient.

supported by Kosack and Tobin (2006), who argue that FDI has no impact on economic growth and causes a slowdown of human development in most less-developed countries. Agénor (2002) finds no evidence on the relationships between FDI and poverty for middle-income countries.

The literature has thus far provided various approaches to examining poverty issues. There are different measures and dimensions of poverty. The Organisation for Economic Co-operation and Development (OECD, 2001) classifies poverty into five dimensions as depicted in Figure 3.1 below:

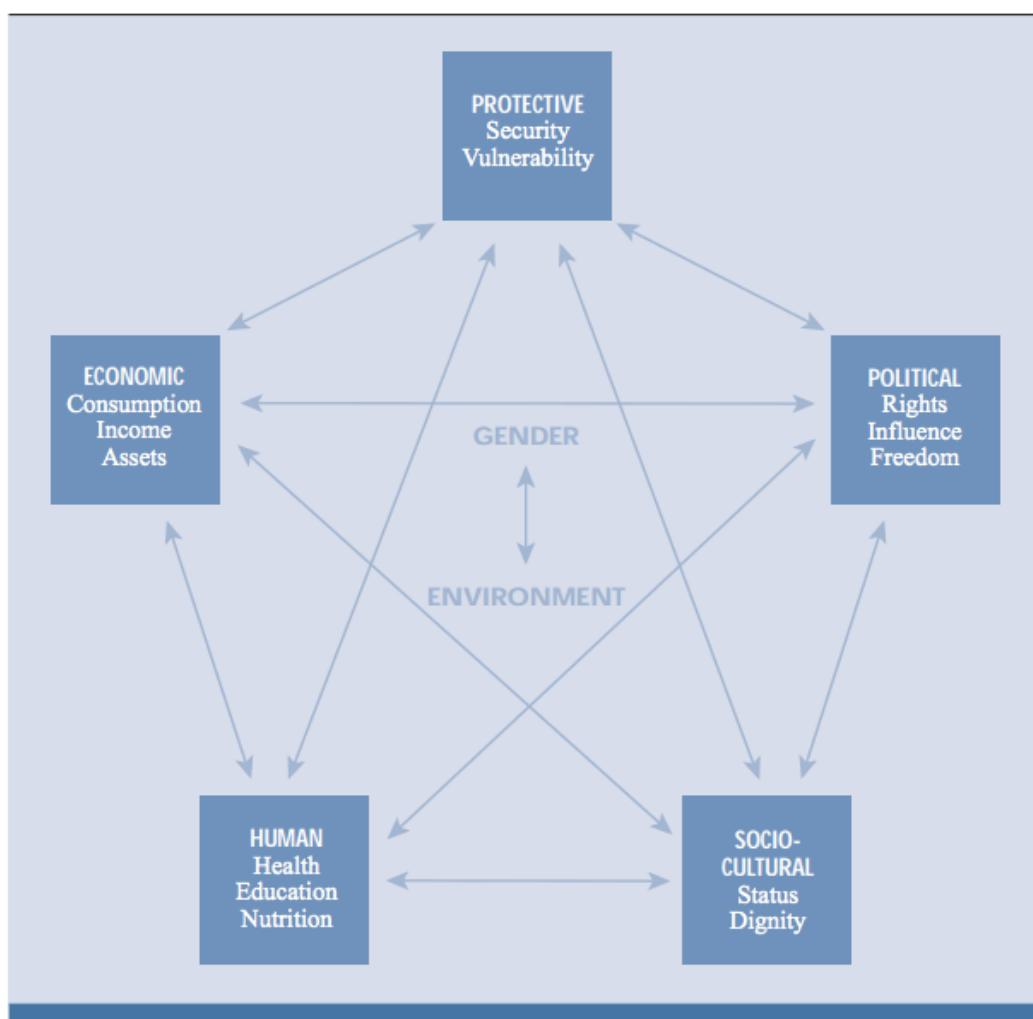


Figure 3.1: Interactive dimension of poverty and well-being

Source: OECD, 2001

In Figure 3.1, the arrows represent the interlinkages with other dimensions. The interconnection between the various dimensions of poverty underscores underscores

the various dimensions that call for a multidimensional approach to address poverty issues. Empirical literature is often challenged on how to quantify the diverse dimensions of poverty accurately.

According to the OECD (2001), there are three prominent measures of poverty documented in the literature, namely discrete and single indicators, and composite indexes. The three levels are depicted in Figure 3.2 below:

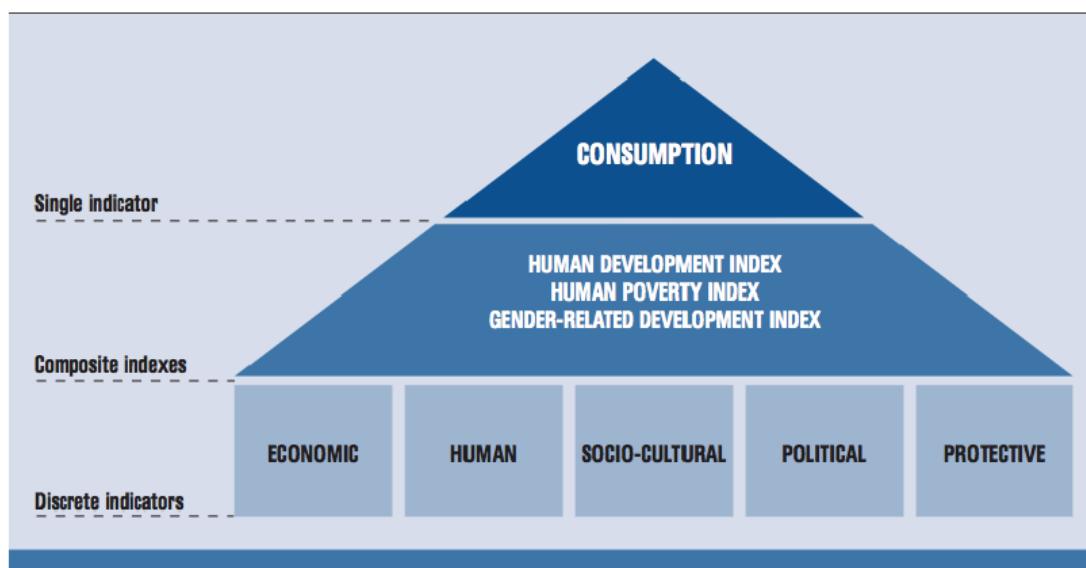


Figure 3.2: Measuring poverty at different aggregation levels

Source: OECD, 2001

The single indicator only captures one dimension of poverty, although one can further classify it into monetary or non-monetary measures. Critics report that a mismatch between monetary and non-monetary indicators of poverty exists. The literature confirms that poverty is also associated with deprivation of health, sanitation, nutrition and any other deficiencies of social requirements (Gohou & Soumaré, 2012). Empirical studies can incorporate non-monetary indicators by focusing on nutrition of children, incidences of specific diseases, or life expectancy (Ravallion, 1996).

Owing to the limitations of monetary indicators, the non-monetary and composite indexes have gained momentum over recent years. The composite indexes encompass the various dimensions of poverty. The composite measure has been more popular since the Millennium Summit of the United Nations on MDGs in 2000. The MDGs

triggered the need to address the multidimensionality of poverty. They provide a paradigm shift to moving beyond aggregated averages to an approach that captures the comprehensive nature of poverty. In Figure 3.2, the bottom pyramid captures the five discrete dimensions of poverty. It guides the empirical literature towards identifying various sources and the means of assessing them.

This paper employs the HDI as a multifactor indicator, child health as a non-monetary single indicator, and per capita gross domestic product to control for monetary single indicator. The rationale for choosing the aforementioned indicator is mainly driven by the need to capture the various dimensions of poverty in Africa, availability of data, and the robustness of poverty comparisons.

The literature section has thus provided useful insights on the evolution of FDI and welfare. It also documents various methodological approaches that have been employed in the empirical literature. There are several drawbacks to and potential literature gap in some of the empirical literature reviewed. Firstly, economic dimension measure of welfare that has been employment by many studies (Blomström et al., 1992; Balasubramanyam et al., 1996; Borensztein et al., 1998; De Mello, 1999; Nair-Reichert & Weinhold, 2001; Campos & Kinoshita, 2002; Li & Liu, 2005) fail to capture the multidimensional and non-monetary measures of welfare. Secondly, there is a paucity of empirical literature that employs multidimensional indicators on Africa (Gohou & Soumare, 2012; Soumaré, 2015). The emphasis of both Gohou and Soumaré (2012) and Soumaré (2015) is based on using the HDI to capture the multidimensional nature of welfare. Although these studies made an important contribution to literature, the issue of non-monetary indicators remains inadequately examined. Thirdly, the majority of existing empirical literature (Agenor, 2002; Milanovic, 2003; Easterly, 2004; Chintrakarn et al., 2012; Soumaré, 2015) fails to capture the non-linear hypothesis that documents the turning points at which FDI may result in welfare gains/losses. Fourthly, the methodological approaches adopted in cross-country empirical analyses have failed to account for heterogeneity within the cross-sectional units. This has important implications with regard to the consistency and impartiality of the resulting parameters. Therefore this paper addresses the inadequacy and the current literature gap by using various welfare indicators

(multidimensional, monetary and non-monetary) in a non-linear heterogeneous panel framework.

3.3 Stylised facts of FDI and welfare in Africa

FDI flows to Africa rose from US\$2.4 billion in 1985 to US\$36 billion and US\$53 billion in 2006 and 2007 respectively, but began to fall in 2008 with the onset of the financial crisis (UNCTAD, 2008). The surge in FDI flows was partially attributed to the twin forces of rising commodity prices as well as a positive investment climate in Africa (UNCTAD, 2008). These increases were characterised by high inflows towards the primary and services sectors, mainly due to exploitation of Africa's vast resources and privatisation schemes by many economies.

Despite a drop during the last few years, Africa has remained an attractive investment destination throughout the global downturn and has managed to maintain its relative share of global investment flows (UNCTAD, 2010). However, FDI flows to Africa have been reported to be relatively low compared with other developing regions. Nonetheless, it is interesting to note that the ratio of its global FDI flows to its share of global output has been relatively constant. Most notably, the proportion of FDI on gross capital formation is extremely high when compared with other developing countries.

The welfare measurement is often based on human development indicators such as the GDP per capita, HDI, inequality adjusted HDI (IHDI), Multidimensional Poverty Index (MPI), and poverty incidence. GDP per capita assumes that welfare is measured by economic factors, ignoring other components, e.g. education, health and sanitation. The HDI extends the measures of welfare by using a composite indicator. It comprises three dimensions, namely long and healthy life, knowledge, and standard of living. The MPI further extends the HDI by using a composite of 10 indicators to capture incidence and intensity of poverty. However MPI was only introduced in 2010 and data for Africa are not sufficient for empirical cross-country comparisons. International poverty incidence, measured by US\$1.25 per day could be another important indicator. However, as stated by Soumaré (2015), data availability and comparability disadvantage it from empirical cross-country studies.

Owing to the limitations outlined above, this paper uses the non-monetary indicator (measured as proportion of undernourished population), the multifactor indicator (HDI) and the standard GDP per capita, to allow comparisons. The components of HDI are explained next. The health dimension is measured by life expectancy at birth, knowledge is measured by the mean years of schooling for adults aged 25 and above, while expected years of schooling are used for school entering age. Standard of living is measured by gross national income per capita. Figure 3.3 below presents a detailed overview.

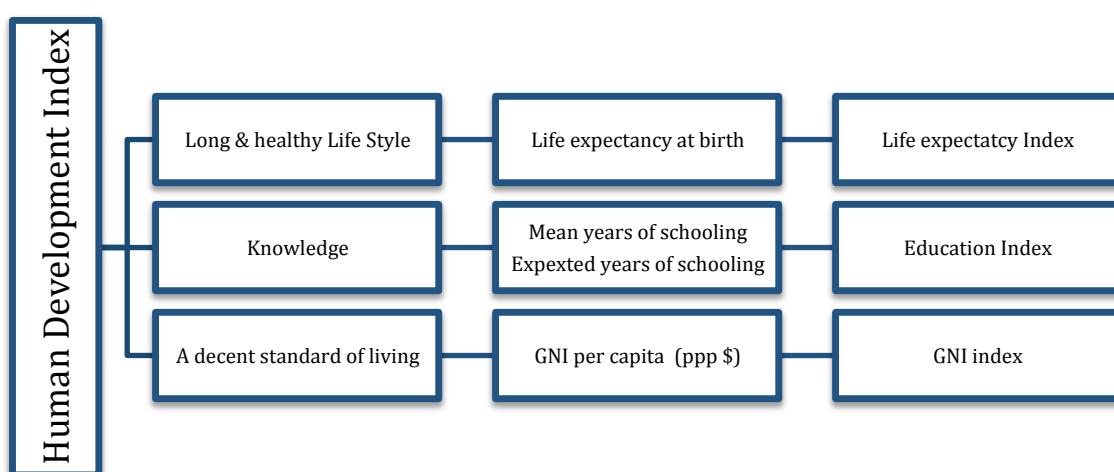


Figure 3.3: HDI components

Source: Author's design

Figure 3.3 depicts the dimensions, indicators and dimensions index of the human development index. The HDI is based on the assumption that a long and healthy living standard that is knowledgeable and has access to a better standard of living will constitute a decent quality of life (OECD, 2001). However, the HDI does not account for inequality issues. Figure 3.4 presents a scatter plot of the HDI and Gross National Income (GNI) per capita. It depicts that most African countries have recorded HDI growth. The highest HDI growth between 2000 and 2012 was reported for Sierra Leone, Rwanda, and Angola, whereas countries like South Africa, Seychelles, Mauritius, and Equatorial Guinea reported a relatively low growth rate. Moreover, it is evident that countries with a high GNI per capita did not necessarily record the

highest HDI growth. This is contrary to what is perceived in most theoretical arguments.

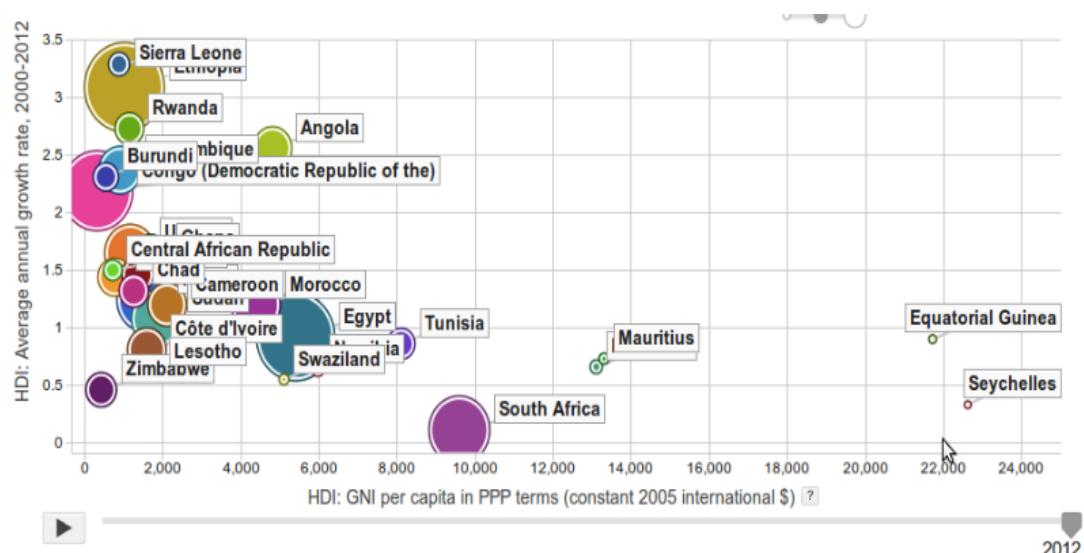


Figure 3.4: HDI growth and GNI per capita

Source: Author's computation based on the 2013 UNDP online database

Similarly, Figure 3.5 depicts a scatter plot of HDI growth and inequality adjusted HDI (IHDI). Countries like Ethiopia, Angola, and the DRC reported the highest HDI growth; however, they fared relatively low down on the IHDI. The scatter plot further suggests that inequality appears to be prevalent in most African countries, as they recorded relatively low values of IHDI. The heterogeneity and dynamics within the welfare indicators further underscore the need for an empirical evaluation.

Although Africa lags behind in terms of relative and absolute poverty, recent evidence reports that poverty has relatively declined over the period 2005–2010. The proportion of the population living under the poverty line declined from 47 percent in 1990 to 40 percent in 2008. The decline was, however, heterogeneous across countries.

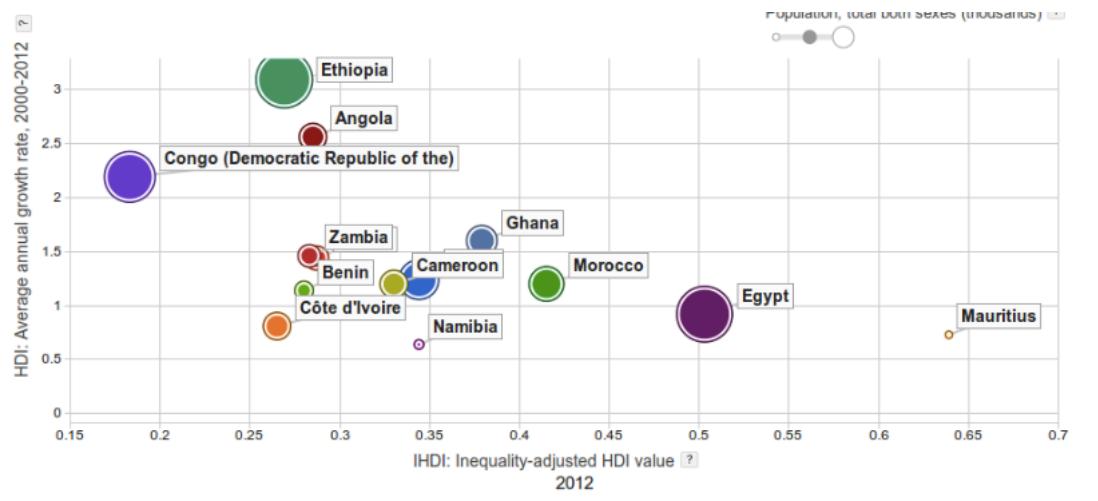


Figure 3.5: HDI and IHDI scatter plot

Source: Author's computation based on the 2013 UNDP online database

It is evident that economic welfare and social inequity pose developmental challenges to Africa. Moreover, there is a growing debate that FDI could directly lead to welfare enhancement through employment creation, human capital development and higher productivity. A rigorous empirical study that examines the potential linkages between FDI and welfare is therefore important, given the growing concerns of universal human development issues in Africa.

3.4 Methodology

3.4.1 Theoretical framework

The theoretical framework of this paper is anchored on the endogenous growth theories and the liberal theory of welfare. The issues of welfare are presumed to result from the interactions between global socio-economics and the host economies' macroeconomic fundamentals. A recent surge in inward FDI flows to Africa (as explained in Chapter 2) implies that it has a great potential to redirect and shape host countries' developmental policies. It builds on the view that the international business community in terms of FDI should be compelled to contribute to poverty reduction.

Based on Romer (1990), the theoretical framework follows a standard Cobb–Douglas production function of the form:

$$Y_{cit} = A_{cit} K_{ct}^\alpha L_{ct}^\beta \quad (3.1)$$

where Y , A , K , L are output, total factor productivity, capital, and labour, respectively. The subscripts c , i and t , represent countries, industries and time periods respectively. Equation 3.1 can be written in per capita terms to obtain:

$$(Y/L)_{cit} = A_{cit} (K/L)_{ct}^\alpha \quad (3.2)$$

There is an underlying assumption that total factor productivity is a function of previous sectoral physical capital.

$$A_{\square it} = \mathcal{F}(DINV_{ct-1}, FDI_{cit-1}) = DINV_{ct-1}^\phi * FDI_{cit-1}^\theta \quad (3.3)$$

where $DINV$ denotes domestic investment. The model assumes that new investment will translate into productivity (via learning by doing) after a one-period lag. We substitute Equation 3.3 into Equation 3.2, log linearise and first-difference the resulting equation to obtain:

$$gy_{cit} = \phi g dinv_{ct-1} + \theta g fdi_{cit-1} + \alpha g k_{ct} \quad (3.4)$$

The growth rate of output per capita is therefore a function of previous growth of investment in a given industry and of changes in the country's capital labour ratio. As postulated by the liberal theory, capital in terms of FDI is expected to increase output and through the multiplier effect create more jobs and better living conditions. Stemming from the above theoretical framework, the link to welfare gains can be transmitted via FDI forward and backward linkages. The multiplier effects of capital in terms of FDI will result in an increase in employment, health, skill development and labour productivity, and consequently an enhancement in welfare. This theoretical framework underpins two mechanisms that explain the link between FDI and welfare. This could be transmitted via spillover effects, as well as through its impact on labour markets and human capital/knowledge accumulation.

3.4.1.1 Model specification

Following Gohou and Soumaré (2012) and Mirza et al. (2003), the following model (Equation 3.5) will be estimated:

$$Welfare_{it} = \alpha_{it} + \beta_{1,it} FDI_{it} + \beta_{2,it} FDI_{it}^2 + \beta_{3,it} X'_{it} + \varepsilon_{it} \quad (3.5)$$

$$\varepsilon_{it} = \delta_t + \xi_{it}$$

where, welfare denotes a given welfare indicator, FDI = foreign direct investment, X^3 is a vector of control variables and ε_{it} is the usual stochastic error term and is decomposed in two parts: the time variant (δ_t) and the reminder error process. The subscripts it denote countries and time period respectively.

To estimate the turning point of the quadratic relationship in Equation 3.5, we need to derive the partial derivative of Equation 3.5 to obtain:

$$\frac{d\text{welfare}}{d\text{fdi}} = \beta_{1,it} + 2(\beta_{2,it})\text{FDI}_{it} \quad (3.6)$$

Equation 3.6 will yield the marginal effects of a given value of FDI on welfare. The turning point at which the effects of FDI switch from positive to negative and vice versa is generally referred to as the point of inflection. The marginal effect at this point will be zero. Substituting zero for the slope and solving for FDI will yield the following turning point;

$$\text{FDI}_{it} = \frac{-\beta_{1,it}}{2(\beta_{2,it})} \quad (3.7)$$

When the relationship is non-linear, the concavity/convexity is determined by the sign of $\beta_{2,it}$. If the sign of $\beta_{2,it}$ is negative, the relationship is concave. Similarly, a positive $\beta_{2,it}$ implies a convex relationship.

The majority of empirical literature in Africa with exception of Gohou and Soumaré (2012) and Soumaré (2015) have concentrated on economic dimensions of welfare, ignoring the non-monetary and multifactor measures of welfare. Both Gohou and Soumaré (2012) and Soumaré (2015) have used FDI net inflows and HDI as measures of welfare. This study used FDI stock, and in addition to GDP per capita and HDI, the study further decomposed HDI to zoom into a non-monetary measure of welfare. This could pose limitations, because welfare has been argued as categorised by various dimensions. Hence, failure to account for various and specific non-monetary aspects may not adequately capture the links between FDI and welfare. To capture both the

³ The study would have benefited from expenditure on education as part of control variables; however, due to data constraints it has been omitted from the study.

various indicators and the non-monetary aspects of welfare, this paper employs three indicators. The multidimensional aspect of welfare is captured by the HDI; the proportion of an undernourished population represents the non-monetary indicator, and GDP per capita (one-dimensional economic indicator). A non-monetary indicator can address the issue of inequality, which is mostly associated with monetary aggregated measures.

The matrix X_{it} represents a vector of control variables. The control variables are chosen to account for economic variables: (per capita GDP, trade openness, active labour force), financial development (domestic credit to the private sector), quality of institutions (political worldwide governance performance indicators measured as regulatory quality), general wellbeing (health index) and general level of education (education index).

The justification for control variables is based on existing literature. Development economists regard economic growth as a necessary but not sufficient condition to address welfare issues (Squire, 1993; Bruno, Ravallion & Square, 1998; Vijayakumar, 2013). Moreover, the conceptual linkages between economic growth and welfare lie on the predictions that a positive economic growth enables the economies to improve their productive capacity that will ultimately lead to more jobs and an increase in income. In this regard, GDP per capita is expected to increase welfare (Ravallion, 1995; Ravallion & Square, 1998 and Vijayakumar, 2013). The a priori expectations rest on these arguments so that GDP per capita is expected to exhibit a positive sign. Theoretical predictions on financial development (measured as domestic credit to the private sector) are anchored on the endogenous growth theories that argue for financial development as having potential to promote technological innovation thorough capital mobilisation and saving accumulation (Romer, 1986; Aghion and Howitt, 1992). Literature identifies two channels through which it could affect welfare. The first channel indicates that domestic credit to the private sector increases welfare by enhancing financial inclusion to the poor. The second channel arises from the indirect link. Financial development improves welfare indirectly by stimulating economic activities (King & Levine, 1993; Levine, 2005; Beck et al., 2007). Therefore, financial development is expected to exhibit a positive relationship. Similarly health and education indices are expected to increase welfare. They are

among the main pillars of economic development as outlined in the Millennium Development Goals crafted in 2000. It is further expected that labour will have a positive influence on welfare. The employment channel increases welfare through its potential to reduce the unemployment rate by allowing some labour force to migrate out of poverty (Colen, Maertens & Swinnen, 2008). Similarly, an increase in trade openness is expected to promote welfare. As documented in Dollar and Kraay (2004), trade openness could lead to improved economic growth that will ultimately lead to a fall in absolute poverty. Conversely, inflation could be detrimental to welfare gains. High and unstable inflation will distort the value of money (Bailey, 1956); hence a negative sign is expected. Rodrick, Subramanian and Trebbi (2004) argued that institutional rules and good governance promote sound macroeconomic management and the general wellbeing of countries' citizenry in a way that is equitable. Therefore a strong governance indicator is expected to strengthen welfare gains.

3.4.1.2 Modelling strategy

There have been new developments on how to model different panel data methodologies in the best possible way. First-generation models of panel data analysis placed less emphasis on the time series properties of the data (Hoechle, 2007). Moreover, the first-generation models have imposed a strong assumption of cross-sectional independence. Baltagi and Pesaran (2007) criticise that by erroneously assuming cross-sectional independence when it does not hold, can lead to misleading inferences. They further argue that when cross-sectional dependence is present, the usual models of GMM and Instrumental Variables (IV) that control endogeneity may not yield consistent estimates.

There is also a great concern that a vast portion of existing literature is modelled on the traditional fixed or random effect models that impose the homogeneity assumption on the slope parameter. These techniques do not allow the individual slope parameter to change. Essentially, the process entails the pool of individual cross-sections under the assumption of homogeneity in slope parameter, whereby only the intercept is permitted to differ across all cross-sectional units. It is argued that when N (cross-sectional unit) is relatively larger and consists of countries/regions, the traditional assumption of homogeneity in slope parameters may not be correct (Pesaran & Smith,

1995; Blackburne & Frank, 2007; Im, Pesaran & Shin, 2003). Therefore, failure to account for heterogeneity in panel models may yield inconsistent estimates (Pesaran & Smith, 1995).

To address the problem of cross-sectional dependency, this paper uses Driscoll and Kraay (1998) standard errors that are robust to serial correlation, heteroscedasticity and cross-sectional dependence. According to Hoechle (2007), the fixed-effects regression with Driscoll and Kraay standard errors is implemented in two steps. The first step models all variables $z_{it} \in \{y_{it}, x_{it}\}$ that are within-transformed as follows: $\tilde{z}_{it} = z_{it} - \bar{z}_i + \bar{z}$ where $\bar{z}_i = T_i^{-1} \sum_{t=1}^{T_i} z_{it}$ and $\bar{z} = (\sum T_i)^{-1} \sum_i \sum_t z_{it}$. The resulting within-estimator corresponds to the Ordinary Least Squares (OLS) estimator of the form:

$$\tilde{y}_{it} = \tilde{x}'_{it} \theta + \tilde{\varepsilon}_{it} \quad (3.6)$$

The second step entails applying the pooled OLS estimation technique to Equation 3.6 to derive the parameters.

As a robustness check, the paper employs the Augmented Mean Group (AMG) estimator developed by Eberhardt and Teal (2010) to accommodate panel time-series models with heterogeneous slopes. The AMG estimator modified the Common Correlated Effects Mean Group (CCEMG) developed by Pesaran (2006) to allow for heterogeneous slopes and cross-sectional dependence with a common dynamic process. The AMG estimator is also superior to the Mean Group (MG) estimator by Pesaran and Smith (1995), which does not account for cross-sectional dependence. Following Pesaran (2006), the empirical setting takes a form of panel models with a heterogeneous slope of $i = 1, \dots, N$ and $t = 1, \dots, T$ such that:

$$y_{it} = \beta_i x_{it} + u_{it} \quad (3.7)$$

where: $u_{it} = \alpha_{1i} + \lambda_i f_t + \varepsilon_{it} \quad (3.8)$

$$x_{it} = \alpha_{2i} + \lambda_i f_t + \gamma_i g_t + e_{it} \quad (3.9)$$

whereby, x_{it} and y_{it} represent independent and dependent variables respectively, β_i represents a country-specific slope of the regressors, u_{it} encompasses the unobservable and the stochastic residual components ε_{it} . In Equation 3.8, α_{1i} denotes

time-invariant heterogeneity within groups, and f_t captures unobserved common factors with heterogeneous factor loading λ_i that captures time-variant heterogeneity and cross-sectional dependency. Moreover, factors f_t and g_t can be linear, non-linear and non-stationary. Panel models with a small cross-sectional dimension $N \leq 10$ and large/small time dimension can be better handled within a Seemingly Unrelated Regression (SUR) as an alternative to mitigate the issue of heterogeneity, given that sufficient conditions are met. According to Kapetanios, Pesaran and Yamagata (2011), the application of SUR models to panel data with larger cross-sectional units has been reported to lack practical feasibility and hence, may not be suitable for 20 cross-sectional units in this study.

3.4.2 Data sources and variables description

In this paper, a panel data set of 20 African countries was used, namely, Botswana, Cameroon, Côte d'Ivoire, Egypt, Ethiopia, Ghana, Kenya, Malawi, Mali, Mauritius, Morocco, Mozambique, Nigeria, Senegal, Sierra Leone, South Africa, Tanzania, Tunisia, Uganda, and Zambia from 2000 to 2013. The sample was chosen based on the consistent availability of the data within the ambit of the study.

Table 3.1 Variable description and data source

Variables	Description	Data sources
HDI	Human development index	United Nations Development Programme online database (UNDP)
GDP per capita	Real GDP per capita (annual)	World development (WDI) indicators
Undernourished population	Proportion of undernourished population (annual)	WDI
FDI to GDP ratio	Inward FDI stock to GDP ratio	UNCTAD database
Health Index	Life expectancy at birth	UNDP
Education Index	Mean years of schooling and expected years for school	UNDP
Labour	Active labour force (annual)	WDI
Consumer price index	Consumer price index based 2005	WDI
Domestic credit to the private sector	Measured as percentage to GDP	WDI
Trade openness	Sum of import & exports to GDP ratio	WDI
Governance indicator	Measured by regulatory quality. Its values range between -2.5 (weak) to 2.5 (strong) governance performance. It reflects the perception of the government's ability to formulate and implement sound policies and regulations that permit and promote private sector development.	WDI

3.4.3 Time series properties of the data

Table 3.2: Descriptive statistics

Variable	Obs	Mean	Std. Dev	Min	Max
Foreign direct investment	277	0.9001	0.9656	-3.198	3.651
Real GDP per capita	280	9.729	1.213	6.81	12.65
Active labour	280	8.921	1.098	6.275	10.91
Trade openness	280	3.35	0.4241	1.855	4.123
Domestic credit to private sector	280	3.049	0.8621	0.488	5.121
Undernourished population	280	2.739	0.833	1.609	4.06
Health Index	280	0.562	0.141	0.279	0.86
Governance performance	280	-0.306	0.498	-1.377	0.983

Source: Author's computation based on the UNCTAD, World Bank & UNDP 2015
online databases

3.4.3.1 Unit root test

To account for possible stationary problems, this study tests for unit roots. Several unit root tests can be implemented in panel data analysis (Levin–Lin–Chu test, Im, Pesaran and Shin (IPS) Test, Breitung test, Fisher-type test, etc.). The Fisher unit root test is presumed to work better under unbalanced panels. In this paper, the IPS test was used, because it accounts for heterogeneity within the panel.

Table 3.3: Panel unit root test

Variable	IPS -level		IPS-first diff.	
Foreign direct investment	-6.7821	(0.000)***		
Real gross domestic product	6.2216	(1.000)	-42.0043	(0.000)***
Health index	-10.3117	(0.000)***		
Human development index	-9.3310	(0.000)***		
Governance indicator	-8.8928	(0.000)***		
Education Index	-0.0542	(0.4784)	-14.0018	(0.000)***
Trade openness	-1.3201	(0.0934)	-6.1010	(0.000)***
Active labour force	4.906	(1.000)	-37.4974	(0.000)***

Where *** denotes 1% significance level

Source: Author's computation based on the UNCTAD, World Bank & UNDP 2015
databases

From Table 3.3, the unit roots test reports that most of the variables are stationary at levels integrated of order zero i.e. I (0.), while real GDP, education index, trade openness, and active labour force are stationary at first difference, hence, I (1).

3.4.3.2 Cross-sectional dependence, heteroscedasticity and serial correlation tests

In order to examine the time series properties of the data in terms of cross-sectional dependence among the cross-sectional units, a non-post-estimation test suggested by Pesaran (2004) was used. The test statistic of this technique is based on the average of the pair-wise correlation of the estimated residual. The expression is given by Equation 3.6:

$$CDS = \sqrt{\frac{2T}{N(N-1)} \left[\sum_{i=1}^{N-1} \sum_{j=i+1}^N \hat{\rho}_{ij} \right]} \quad \text{where } CD \sim (N, 1) \text{ for } T_{ij} > 3 \quad (3.6)$$

According to Pesaran (2004), cross-sectional dependence tests the null hypothesis of cross-sectional independence. The results are presented below:

Table 3.4: Cross-sectional dependence, heteroscedasticity and serial correlation tests

Variable	CD-test	P-value	Corr	Abs (corr)
Human Development Index	48.01	0.000	0.934	0.934
Real GDP per capita	49.73	0.000	0.968	0.968
Trade openness	10.8	0.000	0.211	0.369
Domestic credit to private sector	21.37	0.000	0.416	0.702
Active labour	50.54	0.000	0.983	0.983
Consumer price index	48.89	0.000	0.971	0.971,

Pesaran's test for cross-sectional independence = 9.969, Pr = 0.0000

Modified Wald test for heteroscedasticity	Wooldridge test for autocorrelation
$H_0: \sigma_i^2 = \sigma^2 \forall i$ $\text{Chi}^2(20) = 1546.30$ $\text{Prob} > \text{chi}^2 = 0.000$	$H_0: \text{no first -order autocorrelation}$ $F(1, 19) = 87.122$ $\text{Prob} > F = 0.0000$

Source: Author's computation based on the UNCTAD, World Bank & UNDP 2015 online databases

The first panel of Table 3.4 reports the Pesaran (2004) non-post-estimation command results under the null hypothesis of cross-sectional independence. The last two blocks were implemented as a post-estimation command result. Table 3.4 reports that this study fails to accept the null hypothesis of cross-section independence; hence there is sufficient evidence to conclude that the data suffers from cross-sectional dependence. Similarly, the Driscoll and Kraay standard errors assumption of heteroscedasticity and autocorrelation has been supported by the data.

3.4.3.3 Hausman specification test

In order to establish the consistency of this study's estimates, the Hausman test was used to examine the suitability of a fixed or random effect within the Driscoll–Kraay standard errors. Table 3.5 below provides sufficient evidence to conclude that the random effect is inconsistent. Therefore, the study uses a fixed effect model within the Driscoll–Kraay standard error estimates.

Table 3.5: Hausman test

Test: Ho: difference in coefficients not systematic
chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 1062.62
Prob>chi2 = 0.0000

Source: Author's computation

3.4.3.4 Empirical estimates and interpretations

Table 3.6a reports on empirical estimates of the model. Three welfare indicators were used: the HDI, the proportion of an undernourished population, and real GDP as a robustness check for a monetary indicator. As outlined in the theoretical framework, both FDI and the quadratic term of FDI to capture the non-linear effect of FDI were included.

Table 3.6a: Driscoll and Kraay standard error estimates

Variable	HDI	Undernourished	Real GDP
Foreign direct investment	0.00111** (0.00046)	-0.160*** (0.0396)	0.00323** (0.00129)
Foreign direct investment squared	-0.006*** (0.002)	0.164 (0.147)	-0.00851** (0.0038)
Education index	0.981*** (0.135)	-16.60*** (5.183)	0.943*** (0.216)
Real GDP per capita	0.110*** (0.0274)	-3.038* (1.709)	
Active labour	0.0527 (0.0344)	-24.56*** (5.466)	0.797*** (0.116)
Trade openness	0.011 (0.00883)	3.668* (1.881)	0.130*** (0.0369)
Domestic credit to private sector	0.0252*** (0.00761)	0.786 (0.479)	0.0423 (0.0271)
Consumer price index	0.0271** (0.0102)	2.548** (0.89)	0.235*** (0.0522)
Governance indicator	-0.0204* (0.0104)	-2.445** (0.962)	0.0939*** (0.028)
Constant	-2.952*** (0.261)	249.1*** (34.5)	0.558 (0.863)
Turning point	9%		19%
Observations	274	275	275
Number of groups	20	20	20

Standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: Author's computation based on UNCTAD, World Bank & UNDP 2015

online databases

The results with regard to the HDI welfare model are discussed first (column 2 of Table 3.6a). From the results it is observed that FDI is associated with an increase in the HDI. However, the quadratic term is significantly negative. This suggests that at the early stage of FDI, welfare gains are recorded; however, high levels of FDI would gradually lead to a loss in welfare. Therefore, FDI will first improve welfare until a turning point, after which further increases in FDI may not support the welfare-enhancing hypothesis. The turning point⁴ is estimated to be 0.0925. This indicates that a declining trend will occur when the proportion of inward FDI stock to GDP is around 9%. The notion of a non-linear relation between FDI and a multidimensional welfare indicator is therefore supported by the data. The linear component is

⁴ The turning point is computed as $\frac{-\beta_{1,it}}{2(\beta_{2,it})}$

consistent with that found by Klein et al. (2001); Mirza et al. (2003) and Gohou and Soumaré (2012), who support the welfare-enhancing hypothesis in the countries which they have examined. However, these authors did not estimate the turning point for non-linear hypothesis. Findings could also suggest that studies conducted by Chintrakarn et al. (2012), Easterly (2004), Milanovic (2005) and Agénor (2002) that found positive relationships between FDI and welfare without capturing the non-linear effects might be biased in terms of capturing the underlying dynamics. These findings suggest that when a multifactor indicator is employed, FDI spillovers may not lead to lasting welfare improvement. With regard to the control variables, education index, real GDP per capita, domestic credit to the private sector, and consumer price index are all associated with a positive relationship. However, there is an inverse relationship between the governance indicator and the HDI.

The logical explanations of the HDI-welfare model results are manifold. FDI is said to be welfare enhancing when it creates sufficient spillovers in terms of forward and backward linkages to recipient economies. These spillovers can be realised through labour markets, economic activity and productivity. The non-robust link between FDI and HDI could indicate the presence of the competition effect, where foreign firms crowd out domestic entities (Dunning, 1994; Stiglitz, 2002).

The results from the use of the health measure as a non-monetary welfare indicator (Column 3 of Table 3.6a) are, however, different. When a non-monetary indicator is employed, there is supporting evidence that FDI is associated with a fall in undernourished populations. This suggests that FDI is welfare enhancing. The non-linear hypothesis is, however, not supported. It could therefore be argued that FDI is welfare enhancing when a non-monetary welfare indicator is employed. This new evidence seems to support theoretical predictions by Ravallion (1996) that argues that non-monetary indicators might play a major role in detecting omitted attributes of welfare. Arguably, the first HDI model may be inflated by the income component and may not adequately capture the welfare gains embedded in non-income indicators. It could also suggest that foreign firms create employment opportunities that enable employees to afford basic services in terms of health and education services.

The health indicator regression estimates appear to acknowledge that the composite indicator such as HDI is not a sufficient measure of economic welfare. Although HDI is better than the GDP per capital measure, Malhotra (2004:17) argued that “HDI thus has limited scope. It cannot provide a complete picture of human development in any situation. It has to be supplemented with other useful indicators in order to get a comprehensive view of human development”. In the context of the above, other dimensions such as the one-dimensional non-monetary indicators do play an important role in identifying the linkages between FDI and welfare. It is in this perspective that disaggregating the HDI in terms of single non-monetary indicators can unmask important attributes needed for policy formulation.

Another probable explanation for the realised positive spillover from the health sector could be attributed to government involvement. The health sector takes up a large sum of government expenditure in many developing countries and on the continent of Africa in particular. Government expenditure is also regarded as distributive (De Groot, 2014), thus it has great potential to enhance welfare gains. This channel may be realised through loyalty payments from FDI activities to host governments in terms of increased government revenues that will translate into increased government spending and economic activity. Similarly, education, active labour force and good governance performance improve undernourishment and are welfare enhancing.

With reference to the one-dimensional monetary measure of economic welfare, in line with the multidimensional indicator findings, there is supporting evidence that FDI may first improve welfare. However, this appears to be temporary, because the non-linear term reveals that there is a turning point after which further increases in FDI may weaken welfare gains. The turning point is estimated to be 0.1897. This implies that the decline in welfare will be observed when inward FDI stock ratio to GDP is around 19%. Turning point estimates reveal striking results. It can be observed that the turning point for the economic dimension indicator is higher than the HDI. This could be attributed to the underlying transmission mechanisms. As postulated in theoretical literature and in the conceptual framework, economic growth is documented as the indirect channel through which FDI could enhance welfare. Therefore the welfare gains wear off faster for the indirect relationship. It could also indicate that the FDI was mainly driven by financial gains; hence its effect on welfare

is minimal. As before, education, labour and governance performance indicators continue to serve as indirect transmission mechanisms through which FDI spillovers may be realised.

The weakening of FDI spillover to the monetary measure of welfare is not surprising, because many African countries are characterised by higher income inequality that impedes inclusive development. FDI tends to induce employment bias towards skilled labour. This implies that the poor are less likely to benefit from the resulting increase in employment. Furthermore, FDI spillovers are generally activity-type driven. Mergers and acquisitions that make up a larger share of FDI may be beneficial to individual companies. However, they are less likely to enhance economic growth compared with greenfield investments. This is attributed to the reasoning that they may crowd out domestic investment or generate competition that is detrimental to the domestic economy. In this case, the expansionary impact of FDI activities has failed to exceed the contractionary effect of the economies examined.

Further to the composite regression, the regression without South Africa and North African countries (Egypt, Morocco, and Tunisia) has been estimated. These results are reported in Table 3.6b and Table 3.6c respectively. Notably, omitting these countries has no significant impact on the results. The results are therefore robust even after excluding the aforementioned countries.

Table 3.6b: Driscoll and Kraay standard error (*without Egypt, Morocco, Tunisia*)

Variable	HDI	Undernourished	Real GDP
Foreign direct investment	0.000884 (0.00061)	-0.142*** (0.0372)	0.00378** (0.00159)
Foreign direct investment squared	-0.006** (0.00231)	0.0833 (0.12)	-0.00864 (0.00555)
Education index	0.963*** (0.158)	-17.67** (6.882)	0.685*** (0.206)
Real GDP per capita	0.156*** (0.0326)	-5.936** (2.071)	
Active labour	0.097 (0.0575)	-31.15*** (7.757)	0.870*** (0.0868)
Trade openness	-0.0009 (0.0108)	4.630** (1.6)	0.142*** (0.0406)
Domestic credit to private sector	0.00715 (0.00972)	3.393*** (1.04)	0.0206 (0.0327)
Consumer price index	0.0138 (0.011)	3.673*** (1.145)	0.239*** (0.0552)
Governance indicator	-0.0281 (0.0163)	-2.910* (1.414)	0.114*** (0.0343)
Constant	-3.58*** (0.357)	318.2*** (53.31)	-0.262 (0.656)
Observations	218	219	219
Number of groups	16	16	16

*Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

Source: Author's computation based on the UNCTAD, World Bank & UNDP 2015

database

Table 3.6c: Driscoll and Kraay standard error estimates (*without South Africa*)

Variable	HDI	Undernourished	Real GDP
Foreign direct investment	0.00101* (0.000474)	-0.156*** (0.0418)	0.00347** (0.0013)
Foreign direct investment squared	-0.006*** (0.0019)	0.166 (0.173)	-0.0097** (0.0043)
Education index	0.932*** (0.147)	-14.30** (5.144)	0.955*** (0.224)
Real GDP per capita	0.124*** (0.0277)	-3.546* (1.78)	
Active labour	0.0594 (0.0417)	-25.14*** (6.016)	0.799*** (0.111)
Trade openness	0.0059 (0.0102)	3.903* (2.042)	0.133*** (0.0376)
Domestic credit to private sector	0.0250*** (0.00784)	0.845 (0.508)	0.0415 (0.0267)
Consumer price index	0.0262** (0.0108)	2.558** (0.874)	0.230*** (0.052)
Governance indicator	-0.0231* (0.011)	-2.444** (1.07)	0.106*** (0.0254)
Constant	-3.084*** (0.308)	256.2*** (39.43)	0.466 (0.82)
Observations	260	261	261
Number of groups	19	19	19

*Standard errors in parentheses ***p<0.01, **p<0.05, *p<0.1*

Source: Author's computation based on UNCTAD, World Bank & UNDP 2015

databases

3.4.3.5 Robustness check analysis

This section provides an alternative way of estimating the model as a robustness check. Owing to cross-sectional dependence, endogeneity and the possibility of heterogeneity in the slope parameter, this paper employs the AMG estimator developed by Eberhardt and Teal (2010). The results are reported below in Table 3.7a.

The AMG empirical results are consistent with Driscoll–Kraay standard errors. The findings are therefore robust across the two techniques. Table 3.7a reports that when a multifactor measure is employed, FDI improves welfare; however, this will only occur until a turning point, after which further increments in FDI may not be pro-

poor. Therefore, there is no robust supporting evidence to support the welfare-enhancing hypothesis from the HDI or per capita GDP measures. On the contrary, the evidence from the health indicator supports the welfare-enhancing hypothesis.

Table 3.7a: Augmented Mean Group

Variable	HDI	Undernourished	Real GDP
Foreign direct investment	0.00159*** (0.000603)	0.0183** (0.0079)	9.27E-05 (0.00233)
Foreign direct investment squared	-0.00172* (0.000975)	-0.0231* (0.0125)	-0.00636** (0.00298)
Education index	0.917*** (0.108)		0.316 (0.199)
Real GDP per capita	0.0381 (0.027)	-0.385 (0.43)	
Active labour	0.188** (0.0842)	0.385 (0.98)	0.475 (0.406)
Trade openness	0.00176 (0.00325)	-0.0195 (0.0779)	0.0133 (0.0399)
Domestic credit to private sector	-0.000273 (0.00603)	0.00893 (0.0437)	0.0116 (0.043)
Consumer price index	0.0104 (0.0148)	-0.166 (0.203)	-0.00141 (0.076)
Governance indicator	-0.00498 (0.00515)	-0.0536 (0.0534)	0.0122 (0.0204)
Common dynamic process	0.888*** (0.215)	0.987*** (0.344)	1.256*** (0.336)
Constant	-3.966*** (0.881)	3.404 (5.767)	5.568 (3.4)
Observations	265	280	266
Number of countries	19	20	19

*Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

Source: Author's computation based on the UNCTAD, World Bank & UNDP 2015

databases

It is observed that welfare will first worsen until it reaches a turning point, whereafter a subsequent increase in FDI will yield welfare gains. Certain influential economies like Egypt, Morocco, Tunisia, and South Africa have further been monitored within the ambit of this essay. The results are reported in Table 3.7b for the regression without North Africa and Table 3.7c for the regression without South Africa. As before, excluding North African countries and South Africa has no significant impact on the results.

Table 3.7b: Augmented Mean Group (*without Egypt, Morocco, Tunisia*)

Variable	HDI	Undernourished	Real GDP
Foreign direct investment	0.00115** (0.000488)	0.0220** (0.00908)	0.00506 (0.00498)
Foreign direct investment squared	-0.00143* (0.00080)	-0.0293** (0.0149)	-0.0109** (0.00546)
Education index	0.691*** (0.0497)		0.439*** (0.154)
Real GDP per capita	0.0504*** (0.0181)	-0.429 (0.541)	
Active labour	0.313*** (0.112)	0.859 (1.241)	0.945*** (0.335)
Trade openness	0.00115 (0.00394)	-0.0433 (0.0958)	-0.0184 (0.0503)
Domestic credit to private sector	0.000644 (0.00619)	0.0122 (0.0559)	0.0349 (0.0237)
Consumer price index	0.00639 (0.0141)	-0.199 (0.23)	0.0227 (0.106)
Governance indicator	-0.00666 (0.00578)	-0.0654 (0.0671)	-0.0117 (0.0213)
Common dynamic process	0.842*** (0.157)	0.915*** (0.311)	0.871** (0.368)
Constant	-4.981*** (0.931)	0.106 (7.428)	0.556 (2.766)
Observations	209	224	210
Number of countries	15	16	15

*Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

Source: Author's computation based on the UNCTAD, World Bank & UNDP 2015

databases

Table 3.7c: Augmented Mean Group (*without South Africa*)

Variable	HDI	Undernourished	Real GDP
Foreign direct investment	0.000997* (0.000566)	0.0195** (0.00821)	0.0019 (0.00257)
Foreign direct investment squared	6.25E-05 (0.000734)	-0.0248* (0.0132)	-0.00748** (0.00295)
Education index	0.763*** (0.0769)		0.442*** (0.165)
Real GDP per capita	0.0455** (0.0193)	-0.385 (0.452)	
Active labour	0.194** (0.0835)	0.49 (1.037)	0.365 (0.446)
Trade openness	0.00011 (0.00215)	-0.0174 (0.0811)	0.00263 (0.042)
Domestic credit to private sector	0.000763 (0.00633)	0.0139 (0.0457)	0.023 (0.0391)
Consumer price index	0.0112 (0.0146)	-0.178 (0.215)	-0.0326 (0.0704)
Governance indicator	-0.00354 (0.0056)	-0.0599 (0.0554)	0.0134 (0.0233)
Common dynamic process	0.825*** (0.168)	0.982*** (0.336)	1.285*** (0.347)
Constant	-3.924*** (0.737)	2.575 (6.145)	6.030* (3.629)
Observations	251	266	252
Number of countries	18	19	18

Standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: Author's computation based on the UNCTAD, World Bank & UNDP 2015

database

3.5 Conclusion and policy implications

The paper examined the effect of FDI on welfare in Africa. An important feature of this paper is its ability to capture multidimensional welfare measures and the non-linear effect of FDI on welfare. Firstly, empirical results emanating from this study suggest that economic welfare is a multidimensional phenomenon. When multifactor and monetary indicators are employed, the positive effect of FDI on welfare is limited, because it is offset by the quadratic term. This implies that with regard to HDI and monetary indicators, FDI is beneficial only until a certain stage of development. However, FDI becomes welfare enhancing when the health non-

monetary indicator is used. The finding is also consistent with results found by Ravallion (1996), who criticised income indicators and endorsed that non-income indicators do play a prominent role in detecting omitted attributes of welfare. Hence, studies that do not account for various indicators of economic welfare may fail to adequately unlock the underlying relationship. Secondly, the relationship between FDI and societal welfare is not always linear as postulated by much existing empirical literature (Agénor, 2002; Easterly, 2004; Milanovic, 2005; Chintrakarn et al., 2012; Gohou & Soumaré, 2012), but it may exhibit a curvilinear pattern.

In conclusion, examining the relationship between FDI and the employed welfare indicators has yielded important findings for international business literature. The findings support the international business specialists' views which often argue that the overall spillover benefits of MNE activities depend largely on the type of FDI, its sectoral spread and the set of economic policies/objectives pursued by the host economies (Dunning, 1994). Notably, theoretical predictions on positive spillovers are partially supported by multifactor and monetary measures. This implies that the nature and type of FDI activities have not generated sufficient backward and forward linkages with African economies. The welfare-enhancing hypothesis is only supported by the non-monetary indicator in terms of health outcomes.

The findings have thus far yielded various useful policy implications for both international businesses and governments/policy makers. However, policy implications may vary across countries and is largely influenced by the level or phase of their industrial development. An important lesson from an international business perspective is that with the rapid globalisation of many industries, FDI could provide benefits to local businesses through economies of scale, coordination advantage, opportunities for co-production, joint venture, and joint marketing arrangements. This may translate into more management rights that allow technological know-how and intellectual property to be kept in the host economies. However, the benefits are not automatic. To attain the above, FDI-related firms need to adopt sustainable business practices that speak to the general welfare of stakeholders of the firms. Such practices will ensure inclusivity, promote community development and improve social welfare.

Although MNE activities have the potential to mitigate poverty issues, the extent to which positive benefits are realised can also be enhanced by government policies. Policies that lay the public infrastructure for skills enhancement and health development will be necessary for FDI to easily translate into labour and health benefits, for instance. In this context, policy makers need to create a conducive environment in terms of absorptive capacity to absorb the FDI and translate it into societal benefits. In addition, the promotion of more long-term and sustained FDI like greenfield investments should be part of policy, especially because greenfield investments are presumed to be more pro-poor.

In sum, as Africa strives for improved social welfare, there is a great demand from international businesses to magnify their social impacts. To policy makers, what matters most is the firms' ability to contribute to social necessities such as health care and human capital development. The extent to which MNEs respond to the societal needs will be crucial in shaping future markets. In addition to core business activities, the social concerns around globalisation may be addressed through the value chain with local firms and engagement in philanthropic activities. It is therefore important for international businesses to align their economic and social impacts through innovation and creativity to progressively contribute to social welfare.

Future research could focus on social welfare indicators such as the new multidimensional poverty index, as well as the inequality adjusted HDI. Additionally, future research should also consider disaggregating FDI inflows by industries and/or by type.

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CHAPTER 4

FDI AND HUMAN CAPITAL DEVELOPMENT IN AFRICA⁵

4.1 Introduction

According to De la Fuente and Ciccone (2000: 10), human capital is defined as “the knowledge and skills embodied in people and accumulated through schooling, training and experience, and are useful in the production of goods, services and further knowledge”. This paper examines the role of FDI on human capital development in selected African countries. The concept of human capital development is among the major concerns in many African countries. Recent developments relating to globalisation have prompted new concerns among developing countries about the effects of FDI on education as a pillar for inclusive development. There is a growing concern that FDI in Africa targets predominantly resource-rich countries; hence it may not boost the education sector of the recipient economies (Zhuang, 2008; Ndeffo, 2010; Adefabi, 2011; Santosa, 2014). However, other scholars (Van den Berg, 2001; Blomström & Kokko, 2002; Barry, 2005; Khan, 2007; Subbarao, 2008; Gittens & Pilgrim, 2013; Azam, Khan, Zainal, Karuppiah & Khan, 2015) have reported that MNCs have the potential to improve education, particularly tertiary education in recipient economies. Moreover, theoretical predictions argue that as MNC activities increase, local industries may not match the resulting demand of skilled labour. Therefore, there is a strong linkage between the expansion of a tertiary education and MNCs’ innovative activities (Montiel, 2006).

According to Borensztein, De Gregorio and Lee (1998:134), FDI does not only promote economic growth but could also serve as an important channel to enhance human capital development because “FDI is a vehicle for the adoption of new technologies, and therefore, the training required to prepare the labour force to work with new technologies suggests that there may also be an effect of FDI on human capital accumulation”. Despite this finding, the majority of studies in Africa (Suliman

⁵ This paper has benefited from comments and suggestions from participants at the 6th Africa Business & Entrepreneurship Conference in Syracuse, New York. The paper is also currently under review for publication in a journal.

& Mollick, 2009; Adefabi, 2011; Cleeve, Debrah & Yiheyis, 2015) continue to concentrate on the effect of human capital on FDI. Studies (Gittens, 2006; Baghirzade, 2012; Soltanpanah & Karimi, 2013; Santosa, 2014) that examined the effect of FDI on human capital development have focused on the entire developing regions or a sub-set of a few countries. Aggregating Africa with other developing regions may not adequately capture the inherent features of Africa. Therefore, this paper addresses the current literature gap by examining the effect of FDI on disaggregated levels of human capital in Africa.

Examining the roles of FDI in stimulating human capital development is important to Africa for many reason. Firstly, Africa is characterised by higher capacity constraints. Identifying the correct channel in terms of education levels will lead to a better understanding of the underlying relationships. Secondly, it will enable policy makers to identify the implications of gearing FDI activities towards human capital development. Thirdly, it will allow well-tailored policy responses that address Africa's specific attributes.

The study further unpacks the underlying relationship by capturing both the linear and non-linear effect. The issue of a non-linear effect is currently gaining momentum. Contrary to the neoclassical predictions of a linear assumption, the new human capital theory has challenged the linearity assumption (Kottaridi & Stengos, 2010). The new approach argues that the relation between FDI and human capital is influenced by various economic fundamentals such as the concept of signalling and competition in the labour market, as well as the concept of segmentation and distribution of employment. Hence, the underlying relationships could exhibit substantial nonlinearities. According to the Zhang and Markusen (1999) theory, the relationship between human capital and FDI is characterised by an inverted U-shaped pattern. They argue that international business entities exploit the factor–price differential by aligning skill-intensive FDI in countries with higher human capital and unskilled labour-intensive FDI in lower human capital economies. This implies that skill-intensive MNCs are less likely to invest when the level of human capital is below the required threshold level. Therefore, an inverted U-shaped curve may occur (Zhang & Markusen, 1999; Alfaro, 2006). Moreover, the lack of controlling the potential endogeneity between FDI and human capital development in prior research calls for

further empirical work.

Therefore, this paper aims to examine the roles that FDI could play in human capital development in Africa. The key contribution of this paper is threefold. Firstly, the effect of FDI on human capital development is examined by using disaggregated levels of educational attainment, namely, primary, secondary, and tertiary levels of education in Africa. Secondly, the predominant neoclassical assumption of linearity is relaxed, and thirdly, countries are classified according to their economic grouping (lower, lower-middle or upper-middle income) to evaluate if there are any differences across different levels of income. Finally, the possibility of cross-sectional dependency and endogenous relationships between FDI and human capital development is controlled.

The remainder of this paper is structured as follows: Section 4.2 presents both theoretical and empirical literature; the methodology and estimation techniques are presented in Section 4.3; Section 4.4 provides empirical analysis; and Section 4.5 reports on the conclusions and policy implications of the study.

4.2 Literature review

Theoretical literature on human capital is advanced by Schultz (1961) and Becker (1964). The view of Schultz (1961) is based on the assumption that human capital in the form of formal education is a necessary element in enhancing production capacity. It regards investment in education as a key instrument in improving efficiency and productivity of factor endowments. Further to these expositions, Becker (1964) presents two different types of human capital, namely general and specific human capital. General human capital is regarded as the generic knowledge and skills not exclusive to specific firms or jobs. The general human capital is accumulated through work experience and education, and it is assumed to be transferable to other sectors of the economy. Accordingly, specific human capital is also accumulated through education, on-the-job training and experience; however it is rarely transferable. According to Becker, specific human capital will only increase a worker's productivity at the firm level.

Accordingly, the neoclassical growth theories are of the view that FDI has the potential to increase technological progress that will translate into human capital gains. However, the underlying assumption of a linear relationship is criticised by new literature. The development of the new endogenous growth theories has emerged by relaxing the assumption of diminishing returns to capital, non-linearity and by rendering technological progress endogenous in the model.

The main endogenous growth theories are attributed to Romer (1986, 1990); Lucas (1988); and Rebelo (1991). The Romer (1986) model has the standard production function of the form:

$$Y_i = F(K_i, A_i L_i) \quad (4.1)$$

where Y , K , A , and L denote gross domestic product, physical capital, technology and labour in firm i respectively. Equation 4.1 is based on two assumptions: first, ‘learning by doing’ work thorough investment firms; this implies that an increase in capital stock K_i , leads to simultaneous increase in its stock of knowledge, A_i . Second, each firm’s knowledge is freely available to all other firms. This suggests that the increase in firm i technology, A_i , is equivalent to the development of knowledge in the entire economy. As such we can replace the A_i in Equation 4.2 with K_i to obtain:

$$Y_i = F(K_i, K L_i) \quad (4.2)$$

Based on constant return to scale, technology grows proportionately with capital; under the main assumption that it is homogeneous of degree one. In this manner, economic growth is endogenously determined.

A subsequent contribution to endogenous growth theory was made by Lucas (1988) to incorporate human capital as a factor of production which he defined as the skills embodied in labour. It relies on the assumption that skills are rival and excludable. Lucas (1988) developed a production function of a form:

$$Y = AK^\alpha(uhL)^{1-\alpha} h_a^\psi \quad (4.3)$$

where Y denotes gross domestic product, A is the level of technology, K is physical capital, u is the time dedicated to productive activities, h represents per capita human capital, L denotes labour force and h_a^ψ is the average positive external effect of human capital. In the second part, the share of human capital that is not utilised in the

productive sector is used to produce extra human capital, which only occurs if the function exhibits non-diminishing returns; then it can be re-written as:

$$\dot{h}_t = h_t B(1 - u_t) - \delta h_t \quad (4.4)$$

where $B(1 - u_t)$ indicates the increase in the amount of human capital of which B is a shift parameter and $(1 - u_t)$ represents the share of human capital devoted to human capital formation, while δ denotes the depreciation of human capital.

Equation 4.4 exhibits constant returns to scale because the growth of human capital is independent of its level. Thus, the growth of human capital in Equation 4.4 can be written independent of its level as follows:

$$g_h = \frac{\dot{h}_t}{h_t} = B(1 - u_t) - \delta \quad (4.5)$$

Therefore from Equations 4.3 to 4.5 we can obtain the growth rate of GDP by rewriting Equation 4.5 as:

$$Y = AK^\alpha(uL)^{1-\alpha} h^{1-\delta-\psi} \quad (4.6)$$

With a few manipulations we arrive at a per capita growth equation of the form:

$$\frac{\dot{y}}{y} = \frac{1-\alpha-\psi}{1-\alpha} B(1 - u) = \frac{1-\alpha-\psi}{1-\alpha} \cdot \frac{\dot{h}}{h} \quad (4.7)$$

Equation 4.7 shows that economic development can be caused by the effectiveness of human capital (B), the positive externality of human capital (ψ), and the share of human capital devoted to human capital accumulation ($1-u$). This implies that endogenous growth occurs if there is a constant growth of human capital, which can only occur on the assumption of constant or increasing marginal returns to human capital accumulation.

Romer (1990) has extended the models by identifying three sectors, namely, the technology production sector, an intermediate production sector where capital goods are produced, and a final output sector. According to Romer (1990), knowledge is not part of the individual as in the case of Lucas's (1988) theory. The part of the human

capital not used directly in the sector producing final goods is used to create new technology. Thus, the level of human capital (H) has a positive effect on the growth of technology (A). Therefore the growth of technology in the first sector has the form:

$$\dot{A} = \sigma H_A \quad (4.8)$$

where \dot{A} and A represent the growth and the level of technology respectively, H_A is the amount of human capital devoted to the accumulation of technology, and σ is the productivity parameter.

In a second sector, each new technology creates a new intermediate product, say z , which in turn determines capital (K). Therefore, K depends on the number of intermediate products, $t = 1, \dots, A$, and the price of unit of z expressed in consumption, η becomes:

$$K = \eta \sum_{i=1}^A z_i \quad (4.9)$$

The function of the final output sector becomes:

$$Y = H_Y^\alpha L^\beta K^{1-\alpha-\beta} \quad (4.10)$$

where H_Y is an exogenous variable indicating the amount of capital not used in the technology-producing sector, i.e. the amount of knowledge used to apply technologies to the production process. It shows that the endogenous growth that translates into human capital development can occur from positive research on innovations, whereas more innovations increase productivity of research.

Rebelo's (1991) point of departure is based on the basic model of two factors of production, namely, reproducible (physical & human capital) and non-reproducible capital (land). The capital sector is used to produce investment goods (I_t), but it uses the fraction $(1 - \phi_t)$ such that $I_t = AZ_t(1 - \phi_t)$. Rebelo assumes that the depreciation rate of capital is given by δ and investment is not reversible ($I_t \geq 0$) such that the growth in capital is given by: $\dot{Z}_t = I_t - \delta Z_t$. Consumption (C_t) in the economy is produced by the remaining capital stock and the nonreproducible capital. Disaggregating Z_t into physical and human capital extends the basic model. The production function is made up of ϕ_t fraction of physical capital stock and $N_t H_t$ efficiency units of labour, where N_t represents labour hours and H_t is human capital for an individual. The production function is expressed as:

$$A_1(\phi_t K_t)^{1-\gamma}(N_t H_t)^\gamma = C_t + I_t \quad (4.11)$$

The depreciation rate of both physical and human capital is given by δ and investment is non-reversible ($I_t \geq 0$) such that we obtain: $\dot{K}_t = I_t + \delta K_t$. Human capital formation per worker is produced by the interaction $K_t = (1 - \phi_t)$ with $N_t H_t$. There is one unit of time associated with each worker that may be spent on work-related activities or leisure (L). According to Rebelo, the difference of $1 - L - N_t$ will be used to accumulate human capital to produce $(1 - L - N_t)H_t$ efficiency units of labour. The human capital equation is generated by using a Cobb–Douglas production function and taking time derivative with respect to human capital to obtain:

$$\dot{H}_t = A_2 [K_t(1 - \phi_t)]^{1-\beta} [(1 - L - N_t)]^\beta - \delta H_t \quad (4.12)$$

Equation 4.12 is almost similar to that of Lucas (1988); however there are two main distinctions: absence of externalities and the contribution on physical capital to generate human capital.

The key contribution of endogenous growth theory has been to reinvigorate and endogenise human capital as an important element of economic activity. However, the theoretical differences within new growth theories are not always clearly distinguishable in empirical analysis. Nevertheless, both theories have different views on human capital. Rebelo's (1991) and Romer's (1990) models can be viewed as complementing that of Lucas (1988), in the sense that while human capital facilitates technological development, it remains in the model as a factor of production. Therefore, according to endogenous growth theories, it can be inferred that foreign direct investment can stimulate human capital via technological diffusion and knowledge spillover.

The endogenous model of FDI and human capital development unifies the possibility of non-linear relations. It implies that FDI promotes knowledge transfer that subsequently translates into human capital development through a gradual process. Furthermore, the model relaxes the assumption of a constant return on human capital development. FDI is expected to increase human capital overtime, which triggers greater investments in education. This implies that skills development is a time-varying parameter, exploring the underlying relation's needs to account for a non-linear effect that would be missed in the standard neoclassical assumption (Cohen,

1995; Rodríguez-Clare, 1996).

With regard to the factor markets, theoretical predictions regarding the link between FDI and human capital are broadly classified into demand and supply frameworks (Slaughter, 2002; Te Velde, 2002). The demand side postulates three channels by which FDI could stimulate human capital development in recipient economies. The three channels are classified as the transfer of technology, spillover effects, and investment in physical capital. The supply side stream argues that FDI may stimulate human capital development through formal and informal (on-the-job) training (Slaughter, 2002). The proponents of technology transfer further note that recipient economies are more likely to experience higher wages, increased demand for skilled labour, and an increase in research and development. This suggests that the increase in wages that translates into an increase in demand for skilled labour is most likely to reduce unskilled workers. However, the resulting increase in research and development stimulates the ability and education of workers and consequently increases the supply of an educated labour force (Bartel & Sicherman, 1999; Slaughter, 2002).

Despite the positive outlook on the theoretical impacts of FDI on human capital development, critics argue that technologies arising from FDI activities are often too sophisticated to comprehend (Moran, 1999; Stiglitz, 2002). This implies that recipient economies with a weak capacity base may not realise human capital gains (Feenstra & Hanson, 1997; Te Velde, 2001). Moreover, the notion of a spillover effect may not be realised, because MNC activities are likely to generate a competitive effect. The competitive effect is said to occur when FDI crowds out employment in domestic industries (Markusen & Venables, 1999). Spillovers may also generate skill-biased development that exacerbates inequality and hinders human capital gains (Te Velde & Morrissey, 2004).

Early empirical literature on FDI, human capital and economic growth nexus is voluminous, among which is the seminal work of Borensztein et al. (1998) who investigated the effect of FDI on economic growth in a framework of cross-country regressions for 69 developing countries for the period 1970–1989. The study concluded that the effect of FDI on economic growth is enhanced by FDI interaction

with the level of human capital in the host country. The authors indicated that countries with low levels of human capital exhibit a negative FDI effect on economic growth. Moreover, there exists a minimum threshold stock of human capital in the host country above which foreign investments are more productive than domestic investments.

There is also a vast amount of empirical literature that supports the hypothesis that human capital development is the main determinant of FDI (Borensztein et al., 1998; Noorbakhsh, Paloni & Yousef, 2001; Bende-Nabende, Ford, Santoso & Sen, 2003; Li & Liu, 2005; Tavares & Teixeira, 2006). There is therefore a clear case of possible endogeneity between FDI and human capital development. From a descriptive perspective, Narang and Jain (2014) employed exploratory research to evaluate the effect of FDI on educational levels in India. The study indicates that although FDI has been instrumental in advancing India's development strategies, its effect on education remains sketchy. Empirical literature on the impact of FDI on human capital accumulation is not only minimal in Africa, but is often limited to aggregated measures that fail to capture the differences in schooling levels. Soltanpanah and Karimi (2013) examined the impact of FDI on human capital accumulation in Malaysia, Thailand, and Indonesia. They used disaggregated measures in terms of school enrolment at primary, secondary and tertiary level as proxies for human capital development. Their study revealed that FDI had a positive impact on human capital development in all three countries examined.

In the same vein, a study conducted by Baghirzade (2012) evaluated the impact of FDI on human development in 12 Commonwealth countries. The study used four human development indicators, namely, school enrolment, health expenditure, gross domestic income and life expectancy. The results reveal that FDI promoted human development in all the examined countries. This finding is in line with the findings of Colen, Maertens and Swinnen (2008) and Makki and Somwaru (2000), who found FDI to be a driver of human capital development. While Soltanpanah and Karimi (2013), Baghirzade (2012), Colen et al. (2008), as well as Makki and Somwaru (2000) support the human capital gains hypothesis, Santosa (2014) reveals insignificant findings in ASEAN countries, and Gittens (2006) reports mixed results. Santosa

(2014) further indicates that links are weak and insignificant for less industrialised economies, as well as for countries that are on the lower rank of FDI inflows. Gittens (2006) also examined the effects of FDI on human capital accumulation in developing countries. Although FDI improved both primary and secondary school enrolment rates, there was no supporting evidence in respect of tertiary education. The negative effect of FDI on tertiary education may be due to a weak capacity base, considering that skilled expertise is scarcer in developing countries.

4.3 Methodology

4.3.1 Theoretical framework

To examine the impact of FDI on human capital development, this paper will adopt the theoretical framework of Rebelo (1991) as well as of Soltanpanah and Karimi (2013). The two are chosen because of their ability to disaggregate the accumulation of the human capital process and the incorporation of labour market conditions.

Therefore the theoretical framework focuses on the assumption that human capital accumulation is generated by physical capital. The paper extends Rebelo's (1991) theory by disaggregating physical capital into domestic and foreign capital. As in Rebelo's theory, an increase in foreign capital in terms of FDI is devoted to human capital accumulation. The continuum values of human capital growth are therefore sustained by the technological progress as explained in Equation 4.12. The theoretical framework further builds on Soltanpanah and Karimi (2013) by incorporating the labour markets through the supply side hypothesis of FDI on human capital development. FDI is presumed to increase wages and demand for labour that will create a conducive environment for capacity development in terms of education and training. This suggests that foreign firms are biased towards skilled labour. This will result in an increase in demand and wages for skilled labour. In order to catch up with limited supply, the resulting multiplier effect is presumed to subsequently create an incentive for the local labour force to acquire human capital through education and on-the-job training. Therefore, FDI will result in an increase in demand for skills development. However, the endogenous growth theory predicts that there is a time lag on the effect of FDI on educational attainment, because today's investment in human capital will be employed as factor endowment in the next period or by the next

generation (Rebelo, 1991). Therefore, the relation between human capital and FDI can be expressed as:

$$HC_{it} = \alpha_0 + \alpha_1 FDI_{it-1} + \alpha_2 FDI_{it-1}^2 + \beta \Omega'_{it} + \varphi_i FDI_{it} GNI_{it} + \lambda_i + \xi_{it} \quad (4.13)$$

where HC denotes human capital, FDI represents FDI stock, and the quadrating term of FDI allows us to capture the non-linear relationship. The prior expectations from Equation 4.13 are that α_1 is expected to be positive as postulated in the framework by Rebelo's (1991) in α_2 can take any sign depending on the inherent characteristic of inward FDI stock, and φ_i is expected to be positive due to market size hypothesis. According to the market size hypothesis, higher-income countries are more likely to be characterised by a high educational attainment relative to low-income groups. Therefore, spillover effects are expected to be higher for middle-income countries compared with low-income groups (Mughal & Vechiu, 2009).

It is worth noting that both α_1 and α_2 are interpreted together. A negative α_1 with a positive α_2 indicates a convex relationship. FDI will worsen human capital until a turning point, after which further increases in FDI will improve human capital development. Where as a positive α_1 with a negative α_2 indicates a concave relationship. Correspondingly, Ω'_{it} is a vector of control variables assumed to affect human capital, λ_i represents individual fixed effects and is constant over time, α and φ_i are parameters, the subscript of $t-1$ on FDI captures the time lag effect, and ξ_{it} is a stochastic error term that is assumed to be uncorrelated with FDI. Additionally, an interactive term ($FDI_{it} * GNI_{it}$) has been included to capture the income level variation in economies.

To estimate the turning point of the quadratic relationship in Equation 4.13, the same procedure from Chapter 3 of using partial derivatives is applied:

$$\frac{dhc}{dfdi} = \beta_{1,it} + 2(\beta_{2,it})FDI_{it} \quad (4.14)$$

Equation 4.14 will yield the marginal effects of a certain value of FDI on human capital. The turning point at which the effects of FDI switch from positive to negative

and vice versa generally is attained at a point where slope will be zero. Substituting zero for the slope and solving for FDI will yield the following turning point:

$$FDI_{it} = \frac{-\beta_{1,it}}{2(\beta_{2,it})} \quad (4.15)$$

When the relationship is non-linear, the concavity/convexity is determined by the sign of $\beta_{2,it}$. If the sign of $\beta_{2,it}$ is negative, the relationship is concave. Similarly, a positive $\beta_{2,it}$ implies a convex relationship.

The specific equations are expressed as:

$$\begin{aligned} Human Capital 1 (Primary Educ.)_{i,t} = & \varphi_0 + \varphi_1 FDIR_{i,t-1} + \varphi_2 FDI_{i,t-1}^2 + \\ & \varphi_3 GNIPC_{i,t} + \varphi_4 GFCF_{i,t} + \varphi_5 INFR_{it} + \varphi_6 ADEP_{i,t} + \varphi_7 LEXP_{i,t} + \\ & \varphi_8 FDIR_{i,t-1} GNI_{i,t} + \lambda_i + \xi_{it} \end{aligned} \quad (4.16)$$

$$\begin{aligned} Human Capital 2 (Secondary Educ.)_{i,t} = & \varphi_0 + \varphi_1 FDIR_{i,t-1} + \varphi_2 FDI_{i,t-1}^2 + \\ & \varphi_3 GNIPC_{i,t} + \varphi_4 GFCF_{i,t} + \varphi_5 INFR_{it} + \varphi_6 ADEP_{i,t} + \varphi_7 LEXP_{i,t} + \\ & \varphi_8 FDIR_{i,t-1} \square NI_{i,t} + \lambda_i + \xi_{it} \end{aligned} \quad (4.17)$$

$$\begin{aligned} Human Capital 3 (Tertiary Educ.)_{i,t} = & \varphi_0 + \varphi_1 FDIR_{i,t-1} + \varphi_2 FDI_{i,t-1}^2 + \\ & \varphi_3 GNIPC_{i,t} + \varphi_4 GFCF_{i,t} + \varphi_5 INFR_{it} + \varphi_6 ADEP_{i,t} + \varphi_7 LEXP_{i,t} + \\ & \varphi_8 FDIR_{i,t-1} GNI_{i,t} + \lambda_i + \xi_{it} \end{aligned} \quad (4.18)$$

where FDIR = inward FDI stock ratio to GDP, and GNI = gross national income per capita (GNI). GNI per capita was used because the World Bank uses GNI per capita to classify economies into various income groupings. GFCF = gross fixed capital formation ratio to GDP, INFR = infrastructure indicator, ADEP = age dependency ratio to working population, and LEXP = life expectancy.

To account for other economic variables that influence welfare, a set of control variables has been included: market size and economic variables (gross national income and gross fixed capital formation), infrastructure development (fixed telephone subscriptions per 100 people), and health and general wellbeing (life expectancy and age dependency ratio). Life expectancy is measured as life

expectancy at birth total years, and age dependency is measured as percentage of working-age population.

Gross national income is expected to lead to an increase in education, because as income increases, economic agents will have more purchasing power to invest in education (Mughal & Vechiu, 2009). Similarly, as an economy increases its investment (proxied by gross fixed capital formation), an increase in human capital formation is expected. Countries with good infrastructures are more likely to impact positively on the demand and supply of educational services. Furthermore, good infrastructure has been reported to boost access to education, and research and development (Agénor & Moreno-Dodson, 2006). An increase in the dependency ratio may be seen as a burden to the working population; hence a negative relation is expected. An increase in life expectancy is expected to exhibit a positive relation, because it indicates healthy individuals that will be able to study more. The neo-classical perspective on the links between FDI and human capital argues that FDI is expected to enhance knowledge spillover and subsequently stimulate a demand for education (Blomström & Kokko, 2003). However, Egger, Egger, Falkinger and Grossman (2005) report that the FDI effect on human capital development could take any direction, depending on individual economies' level of development and the nature of FDI activities.

Following Blomström and Kokko (2003), Mughal and Vechiu (2009), as well as Baghirzade (2012), primary, secondary and tertiary levels of education have been used as a proxy of human capital in Equations 4.16 to 4.18 above. The primary and secondary levels of education are measured by gross enrolment rates of the school-going population in those categories.

4.3.2 Data

The panel data set consists of nine countries (Cameroon, Egypt, Ethiopia, Madagascar, Mauritius, Morocco, Tunisia, Uganda, and Tanzania). Countries were selected based on the availability of all three levels of educational data from 2000 to 2013. FDI data were obtained from the UNCTAD online database (2015); macro-economic variables from World Bank Development Indicators (2015), and

educational attainment data from the UNESCO Institute for Statistics (UIS) database (2015). The sample is confined to nine countries because of unavailability of consistent data for many countries in Africa, particularly tertiary education data. An unbalanced panel could be another alternative; however, this option is not explored because an unbalanced panel suffers from bias when the attrition rate is high (Baltagi, 2005). A paucity of data applies to most African countries; hence the efficiency loss might be considerable

4.3.3 Estimation technique

To ensure valid statistical results, a robust estimation technique requires a well-calibrated econometric model. Panel data is often characterised by cross-sectional and temporal dependency, particularly when the time dimension is relatively small. Furthermore, it is most probable that the term in Equation 4.1 above is endogenous. Endogeneity may arise because of the possibility of a bi-direction causality between FDI and human capital development. Hence, the assumption of exogenous regressors could be violated. In this paper some of the above concerns are addressed by using Generalised Methods of Moments (GMM) estimation technique with Driscoll–Kraay (1998) standard errors that are robust to cross-sectional and partial dependency.

Following Hoechle (2007), the expression of fixed-effects regression with Driscoll–Kraay (1998) standard errors is implemented in two stages. In the first stage, the model is expressed as $z_{it} \in \{y_{it}, x_{it}\}$ where all variables are within-transformed as follows: $\tilde{z}_{it} = z_{it} - \bar{z}_i + \bar{z}$ such that $\bar{z}_i = T_i^{-1} \sum_{t=i1}^{T_i} z_{it}$ and $\bar{z} = (\sum T_i)^{-1} \sum_i \sum_t z_{it}$. The resulting within-estimator corresponds to the OLS estimator of the form:

$$\tilde{y}_{it} = \tilde{x}'_{it} \theta + \tilde{\varepsilon}_{it} \quad (4.19)$$

The second stage entails applying a pooled OLS estimation technique to Equation 4.19 to derive the parameters.

4.4 Empirical estimation

4.4.1 Time series properties of the data

To ensure that this study's estimation does not yield spurious results, it is important to evaluate the time series properties of the data. Several unit root tests can be implemented in panel data analysis (Levin–Lin–Chu test, Im, Pesaran and Shin test, Breitung test, Fisher-type test, etc.). The Fisher-type unit-root test is presumed to work better under an unbalanced panel. This paper employs the Fisher-type unit root test given the unbalanced nature of the panel. The unit root test reports that all of the variables are stationary at first difference, hence I(1).

4.4.2 Cross-sectional dependence

According to Baltagi and Pesaran (2007), data that fails to support the cross-sectional independence hypothesis will yield inconsistent results, particularly when the traditional OLS, GMM and IV techniques are employed. It is therefore imperative to evaluate the cross-sectional dependence to ensure that the correct estimation technique is applied. The traditional panel data model is expressed as $y_{it} = \alpha_i + \beta' x_{it} + u_{it}$, $i = 1, \dots, N$ and $t = 1, \dots, T$, where x_{it} is $K \times 1$ vector of predetermined variables, β is the usual $K \times 1$ vector of parameters, and α_i denotes the time-invariant individual effects. The model assumes that u_{it} is independent and identically distributed over T and N units. Therefore, the hypothesis that $H_0: \rho_{ij} = \rho_{ji} = \text{corr}(u_{it}, u_{jt}) = 0$ for $i \neq j$ needs to be examined where ρ captures the underlying correlation and u is the usual stochastic residual term.

Table 4.1: Pesaran (2004) cross-sectional dependence test

Variable	CD-test	P-value	Corr.	Abs (corr)
Foreign direct investment	17.5800	0.0000	0.9490	0.9490
Gross national income	14.4300	0.0000	0.7660	0.8200
Gross fixed capital formation	6.2300	0.0000	0.7760	0.8200
Age dependency ratio	15.5000	0.0000	0.8200	0.9820
Life expectancy	17.4300	0.0000	0.9390	0.9390
Tertiary education	12.2700	0.0000	0.6290	0.7820

Source: Author's computation based on the WDI, UNCTAD & UNESCO 2015 online databases

Table 4.1 depicts results for a Pesaran (2004) non-post-estimation command that tests for cross-sectional dependence, averaged correlations and absolute correlation coefficients. Table 4.1 reveals that most of the variables exhibit cross-sectional dependence. Similarly, there was no sufficient evidence to accept the hypothesis of homoscedasticity and no serial autocorrelation. Therefore, the Driscoll–Kraay (1998) estimation technique appears to be the better model for the data.

Table 4.2: Descriptive statistics

Variable	Obs	Mean	Std. Dev	Min	Max
Foreign direct investment	108	8.48	1.48	4.94	11.19
Gross national income	117	2.64	1.71	0	4.47
Gross fixed capital formation	117	3.38	1.36	0	4.67
Infrastructure development	117	3.46	1.30	0	4.69
Life expectancy	117	3.46	1.30	0	4.67
Tertiary education	104	6.55	1.11	4.22	8.18
Secondary education	105	2.80	1.09	0.612	4.40
Primary education	109	4.65	0.188	3.95	5.010

Source: Author's computation based on the WDI, UNCTAD & UNESCO 2015 online databases

4.4.3 Empirical results

To address the potential bias that might exist due to endogeneity, the two-stage GMM estimation technique was implemented within the analysis. A modified two-step GMM command that allows for the incorporation of the Driscoll–Kraay option was used. The Driscoll–Kraay option provides an advantage, because it simultaneously mitigates the issue of endogeneity and cross-sectional dependency. Therefore, the resulting estimates are robust to heteroscedasticity and clustering on year, and kernel-robust to common correlated disturbances.

Table 4.3: GMM results with Driscoll–Kraay standard errors

Variables	Human Capital 1	Human Capital 2	Human Capital 3
Foreign direct investment	-5.627** (2.217)	-14.20*** (3.504)	-7.496*** (2.825)
Foreign direct investment^2	0.189*** (0.0603)	0.460*** (0.0735)	0.245*** (0.0907)
Gross national income per capita	-2.603** (1.308)	-5.945** (2.798)	-2.994* (1.82)
Gross fixed capital formation ratio	-0.106*** (0.0305)	-0.202* (0.111)	-0.142 (0.106)
Infrastructure development	0.0726** (0.0315)	0.174** (0.0734)	0.120** (0.0607)
Age dependency ratio	-0.085*** (0.0209)	-0.234*** (0.0736)	-0.214*** (0.0758)
Interaction term (FDI*GNI)	2.496* (1.305)	6.753** (2.88)	3.739** (1.835)
Constant	18.14*** (4.023)	25.53*** (5.508)	14.68** (7.143)
Turning point	14.9	15.4	15.3
Observations	89	92	97
<i>Post estimation Analysis</i>			
<i>Hansen J statistics</i>	2.07	3.933	5.376
<i>Chi-sq (3) P-val</i>	0.5565	0.2688	0.1463
<i>Endogeneity Test statistics</i>	7.714	0.019	0.225
<i>Chi-s q(1) P-val</i>	0.0995	0.8901	0.6354

*Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1*

Source: Author's computation based on the WDI, UNCTAD & UNESCO 2015 online databases

Table 4.3 reports on the two-step GMM estimation result of the three education indicators that were employed in this research study. To mitigate the issue of endogeneity, the linear combination of the lagged values of exogenous regressors and the lagged depended variable as instruments for FDI were used. The instrumental variable estimation technique requires that the validity condition of the instruments be satisfied. In Table 4.3, the Hansen J statistics were included to check for the validity of over identifying restrictions in the GMM model. A statistically insignificant Hansen J statistic indicates that the instruments are valid. The validity of the Hansen J

statistics is therefore satisfied. Furthermore, the endogeneity test statistics were discussed. Although primary (Human Capital 1) education is weakly endogenous, there is greater confidence that foreign direct investment is endogenous; hence the use of the instrumental variable technique is validated.

The first regression (column 2) reports the effect of FDI on primary education. The negative effect is consistent with research conducted by Santosa (2014), who found no supporting evidence on the education/human capital augmenting hypothesis. The positive coefficient of a quadratic term indicates that there is a turning point after which the human capital augmenting hypothesis is supported. The estimated turning point is around 15%. This indicates that although FDI may have a negative effect on primary education gross enrolment rates, there is supporting evidence that this effect is transitory. The finding reports a U-shaped pattern; at the early stage of inward FDI stock to GDP ratio, primary education as a measure of human capital may worsen, but when reaching a level above 15% , FDI will gradually improve the level of human capital development.

The quadratic term positive effect of FDI on primary education is consistent with the theoretical views of Schultz (1961), Becker (1964), Lucas (1988), Romer (1990), and Rebelo (1991) and with the supply-side hypothesis (Slaughter, 2002, Te Velde, 2002, Soltanpanah & Karimi, 2013), which argues that FDI brings innovation in host economies that promotes human capital development. The importance of primary education cannot be overemphasised; it creates a foundation for both secondary and tertiary education. The positive link between FDI and primary education could also spill over to an increased demand for secondary and tertiary education and subsequently increase the threshold level of human capital in the host economy (Borensztein et al., 1998).

Similarly, in line with primary education results, FDI does not immediately augment secondary education. There is supporting evidence that the relationship is non-linear as the positive quadratic term indicates that when inward FDI stock ratio to GDP exceeds 15.4%, FDI will result in an increase in secondary education. This finding also supports the supply side hypothesis where FDI is argued to serve as a catalyst to pursue further levels of education.

The results follow a similar trend with regard to tertiary education. The links between FDI and tertiary education are initially characterised by a negative relationship until a turning point (15.3%), whereafter a further increase in FDI will increase tertiary education. The absence of a positive effect of FDI on the linear term in all three human capital development indicators is in line with critics who argue that FDI could reduce skills development and hinder human development gains. This is particularly consistent with the findings of Kosack and Tobin (2006), who argued that FDI lowered the rate of human development in most of the less-developed economies examined. However, after capturing the non-linear effects of further FDI flows, the positive skills effect occurs and FDI begins to enhance human capital development. Most African countries are actually characterised by a capacity constraint for skilled workforce (Montiel, 2006). It could therefore be argued that attracting FDI when the recipient economies are not ready to compete in the labour market, may temporarily weaken the transmission mechanisms (Borensztein et al., 1998; Gittens, 2006; Sinani & Meyer, 2004; Girma and Görg, 2007).

The positive effect from the quadratic term in this study confirms the empirical findings similar to those found by Soltanpanah and Karimi (2013), Baghirzade (2012), and Colen et al. (2008). With regard to other variables, income and investment appear to retard human capital development. Plausible reasons for this could be skewed benefits of income and investment in developing economies. The age dependency ratio reduces human capital development as expected.

The interactive term indicates that the human capital development effect of FDI increases with higher income levels. This implies that higher income countries are able to initially experience the positive human capital development effect of FDI compared with lower income countries. The efficacy of FDI in stimulating skills development is thus proportionately linked to the level of income.

4.5 Conclusions and policy implications

This study examined the impact of FDI on human capital development. The study used disaggregated levels of primary, secondary and tertiary education enrolment

rates as a proxy for human capital development. The non-linear relation between FDI and human capital development has also been monitored in this paper. To ensure robustness in this study's analysis, an instrumental variable estimation technique within a GMM framework was employed to control for potential endogeneity. Additionally, the Driscoll–Kraay standard errors that are robust to cross-sectional and temporal dependency were implemented. Further to the methodological approach, an interaction term to check possible differentials between low income and higher income countries was included.

As documented by the contemporary human capital theories (Cohen, 1995; Rodríguez-Clare, 1996), findings underscore the importance of capturing the non-linear relation between FDI and skills development. In this context, FDI can serve as a catalyst to promote human capital development in Africa. However, the magnitude to which FDI improves human capital depends largely on the level of inward FDI stock. FDI spillover to human capital is realised when the level of inward FDI stock ratio to GDP is around 15%.

This paper contends that FDI should be incorporated in the socio-economic development policies across Africa. The long-term prospects of internationalisation thus dictate that African economies need to advance their human capital if adaptation of technological spillover and broad-based development is to be attained. Policy implications emanating from the study suggest that Africa needs to ensure a consistent flow of FDI activities to realise the aforementioned benefits. The extent of FDI benefits is attained only after a turning point; it is important to ensure that inward FDI stock goes beyond the turning point.

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CHAPTER 5

FDI AND INCOME INEQUALITY IN AFRICA⁶

5.1 Introduction

This paper examines the effect of FDI on income inequality. According to Atkinson (1997), income inequality is defined as the extent to which income is distributed unevenly in a given country/region. Examining inequality issues is important because a high level of income inequality could make developmental policies to be less efficient. According to Smolensky, Plotnick, Evenhouse and Reilly (1994: 222), “the effectiveness of growth in reducing poverty depends a great deal on how growth is distributed. The rise in inequality offsets the poverty-reducing effects of more than decades worth of growth”. FDI is among the policy instruments implemented in Africa to aid broad-based development (IMF, 1999; UNCTAD, 2005).

Many scholars have found supporting evidence that FDI plays a prominent role in enhancing economic growth, productivity and welfare development in recipient economies (Dollar & Kraay, 2000; Klein et al., 2001; Gohou & Soumaré, 2012; Lehnert et al., 2013). However, recent critics have argued that although FDI has been beneficial in promoting economic development, there are great concerns that FDI is also responsible for widening income inequality (Feenstra & Hanson, 1997; Cornia, 1999; Herzer & Nunnenkamp, 2013). The issue of income inequality has remained a developmental challenge to most developing countries over recent years. According to the International Labour Office (ILO, 2012, 2014), long-term income inequality exhibited an upward trend on average. In Africa, statistics depict that inequality has been either stagnant or has increased for most countries over the past decades (African Development Bank, 2012).

Theoretical predictions consider several implications why FDI may increase income inequality. For instance, despite positive externalities associated with multinational enterprises, FDI is reputed to aggravate wage differentials in host economies (Jaumotte, Lall & Papageorgiou, 2013). Furthermore, most of FDI firms’ profit is

⁶ This paper is currently under review for publication in a journal.

repatriated to the donor countries. This has various implications in terms of bridging the gap between the rich and poor in recipient economies. Notwithstanding this, empirical predictions are also characterised by mixed arguments on the impact of FDI on income inequality.

Empirical literature that focuses on the distributional aspects of FDI is very limited and almost non-existent in Africa (Haddad & Harrison, 1993; Mazundar, 1995; Te Velde & Morrissey, 2001). Haddad and Harrison (1993) examined the wage differentials between foreign-owned and domestic firms in Moroccan manufacturing firms and found that foreign firms pay 30% more. Mazundar (1995) did a similar study in Zambia and Cameroon and documented that foreign firms pay 18% and 24% percent more in Cameroon and Zambia respectively. This finding was consistent with that of Te Velde and Morrissey (2001) who found that foreign firms pay higher wages in Cameroon, Ghana, Kenya, Zambia, and Zimbabwe by 8%, 22%, 17%, 23% and 13% respectively.

The fact that Africa is characterised by widening income inequality has necessitated the need for comprehensive analysis that examines the distribution aspect of FDI. Furthermore, the theoretical arguments on the possibility of a non-linear effect between FDI and income inequality have not been adequately addressed. Theoretical predictions postulate that during the early stage of development, FDI may exacerbate income inequality; however, this effect is expected to diminish with a further increase in FDI (Rostow, 1960). Notwithstanding the above, previous studies have also failed to account for heterogeneity. This may pose several implications for the resulting estimates, particularly in Africa where countries are highly heterogeneous. To ensure robust and consistent estimates, heterogeneous slope is accounted for in the short run by using a Pooled Mean Group (PMG) estimator.

Current literature also does not yield any robust conclusions on the impact of FDI and income inequality. According to Figini and Görg (2011), FDI has improved equal income distribution in developed countries, but the non-linear effect does not hold, whereas developing countries support the non-linear hypothesis. FDI increases wage inequality in developing countries; however, this effect has diminished with a further increase in FDI. Accordingly, Basu and Guariglia (2007) report that FDI widens

income inequality in developing countries. Conversely, Te Velde (2003), Te Velde and Morrisey (2004), as well as Sylwester (2005), found no sufficient evidence to support the hypothesis that FDI worsens inequality. In this regard, it is evident that both theoretical and empirical grounds fail to provide a clear-cut consensus on the impact of FDI on income inequality. Hence, there is a need for substantial empirical studies.

Examining the effect of FDI on income inequality is particularly important for Africa. As depicted in Figure 5.1, the majority of African country are characterised by either high-income inequality or a sluggish decline in income inequality. Accordingly, Nchube and Anyanwu (2012:3) argue that “tackling the problem of income inequality is important because inequality negatively affects progress toward the MDGs and poverty reduction generally; it results in inefficient resource allocation, wasted productive potential, high dependency ratio and impaired institutional development”. High income-inequality can be associated with lack of income mobility and persistent limitations for some segments of the society. Moreover, widening income inequality has important implications for macroeconomic stability and broad-based development policies. An empirical analysis that addresses Africa’s economic issues of inequality therefore is needed.

Therefore, this paper examines the effect of FDI on income inequality in Africa. The contribution of this paper is two-fold. Firstly, the possibility of a non-linear effect between FDI and income inequality is captured. Secondly, it is expected that the levels of income inequality differ across countries. To address this methodological concern, the paper employs a panel model with a heterogeneous slope that is robust, with cross-sectional dependency and endogeneity.

The remainder of the paper is structured as follows: Section 5.1.1 highlights the stylised facts of income inequality and FDI in selected African countries. Section 5.2 presents the literature review, while Section 5.3 and Section 5.4 present the methodology, empirical results, and interpretations respectively. The conclusions and policy recommendations are reported in Section 5.5.

5.1.1 Stylised facts on income inequality and FDI

An understanding of the stylised facts on income inequality and FDI allows one to comprehend the underlying evolution. In this study, two measures of income inequality from the Standardized World Income Inequality Database (SWIID) are used, namely the Gini net and the Gini market. The Gini net represents estimates of the Gini index of inequality in equivalised (square root scale) household disposable income (after tax and transfers), while the Gini market represents estimates of the Gini index of inequality in equivalised household market income (before tax and transfers). Figure 5.1 (blue and red patterns) graphically reflects that although the trend is not universal, it can be observed that income inequality has been sluggish and in some cases increasing on average. Countries like South Africa, Botswana, and Zambia recorded the highest Gini of about 0.6, while Tanzania, Tunisia, Nigeria, and Morocco recorded about 0.4. Mauritius recorded the lowest Gini of about 0.2 on average, while Cameroon, Sierra Leone, Tanzania, and Kenya exhibit a downward trend.

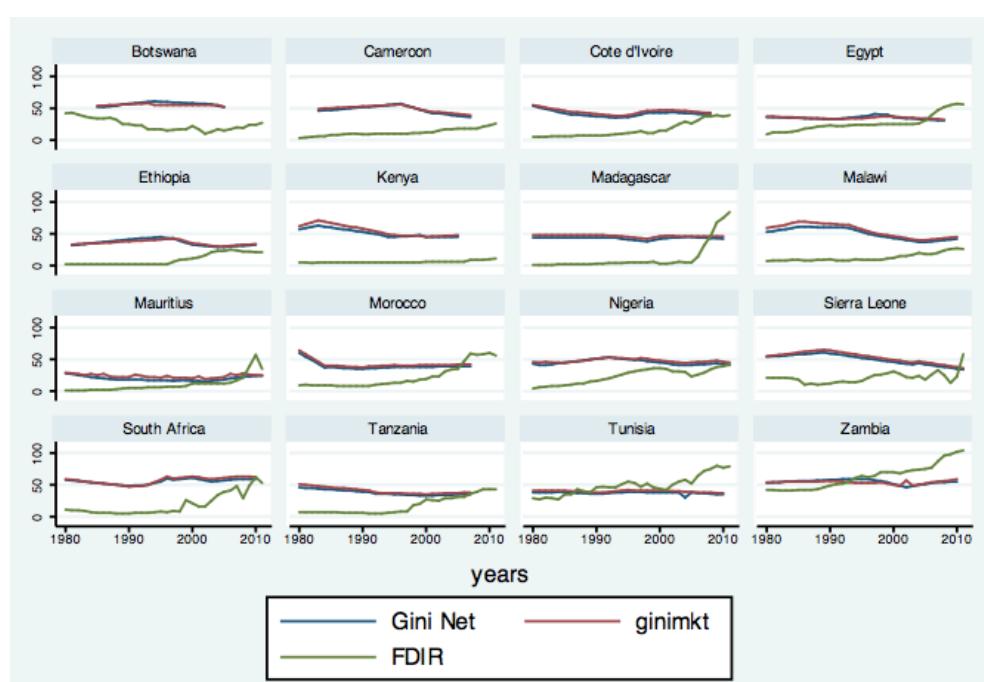


Figure 5.1: Gini net and Gini market trend of selected African countries

Source: Author's computation based on the SWIID 2014 database

Notably, income inequality of large economies like South Africa has worsened since its independence in 1994. A higher level of inequality is presumed to impede welfare

enhancement policies. Hence, the sluggish/higher trend of the Gini coefficient may pose some limitations on African countries' developmental policies.

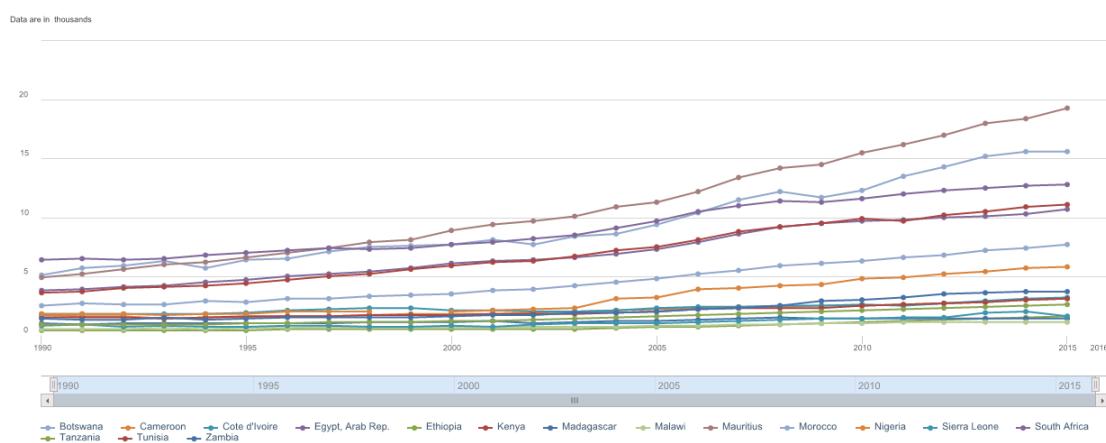


Figure 5.2: GNI per capita for trend for selected African countries

Source: Author's computation based on the World Bank 2016 database

Furthermore, a trend of inward stock of FDI ratio to GDP for similar countries was depicted. The green pattern in Figure 5.1 exhibits an upward trend on average, with the exception of Kenya, where the trend is fairly constant. Similarly Figure 5.2 reports the GNI per capita trends for the same countries. High values are reported for Côte d'Ivoire, Botswana, Egypt, South Africa, and Kenya, while low values are recorded for the majority of the countries in the sample.

5.2 Literature review

Theoretical literature on the FDI-income inequality nexus is characterised by many contending theories. In this paper, the modernisation theory, dependency, and world-systems theory, international trade theories, and transaction cost, economic geography and internal organisational theories of internationalisation are addressed. It is essential to examine different views to ensure that a deeper insight is gained into the evolution of FDI and income inequality, and the underlying theoretical dynamics.

The modernisation theory can be traced to the early 1950s and it revolves around the neoclassical economics (Rostow, 1960). It postulates that countries' development processes occur in different stages. The stage of development will have different implications for income inequality. The modernisation theory further acknowledges

that FDI is associated with technology transfer that translates into spillover gains. However, it views income inequality as an essential component during the early stages of development. This suggests that an increase in foreign capital at the early stages of development will worsen income inequality, but is expected to fall once an optimal development stage is attained. The modernisation theory is consistent with the Kuznets (1955) hypothesis that views the link between economic development and income inequality as characterised by an inverted U-shaped curve. Therefore, economic development arising from FDI activities may also be linked with the Kuznets (1955) hypothesis so that the relation between FDI and income inequality may follow an inverted U-curve.

The dependency and world systems theory views the link between FDI and income inequality to be defined by what it terms the core and periphery of the underlying economies (Mihaylova, 2015). The core represents the highly industrialised developed countries that are abundant in skilled labour, whereas the periphery encompasses the developing countries that are mostly abundant in unskilled labour. The theory argues that the development process of the periphery is often driven by the core through advanced industrial relations. The periphery remains dependent on the core and the resulting integration process is associated with an increase in income inequality. This theory deviates from the modernisation theory by arguing that although FDI may trickle down to the traditional sector (in terms of higher wages), it is highly likely that FDI will engage in capital-intensive production that constrains employment with a resultant rise in income inequality (Girling, 1973). This could be true for Africa where the majority of FDI activities are geared towards the extractive industries.

On the contrary, the traditional Heckscher–Ohlin international trade theory posits that developing countries have a comparative advantage in unskilled labour. This theory links the distributional aspect of FDI with the traditional Heckscher–Ohlin international trade model and the Stolper–Samuelson theorem (SST). The SST implies that most developing countries have a comparative advantage in low-skilled labour; hence FDI could increase demand for low-skilled labour. This will subsequently lead to a fall in intra-country income inequality.

However, SST has been subjected to criticisms on the impact of FDI on income inequality. Feenstra and Hanson (1996, 1997) argue that what is classified as unskilled labour in developed economies could be categorised as skill intensive in developing countries. Therefore, FDI coming from developed to developing economies could exacerbate inequality for recipient countries. Moreover, the technology embodied in FDI activities is often skill biased in nature; hence income inequality may worsen (Findlay, 1978; Wang & Blomström, 1992; Lee & Vivarelli, 2006).

The transaction cost theory views internationalisation of FDI activities as a function of the transaction cost incurred by MNCs. This theory argues that the likelihood to internalise MNCs' operations and processes is determined by their ability to reduce transaction cost. When transaction cost is minimal, MNCs are more likely to internalise and retain ownership (Verbeke, 2005). This will increase knowledge spillover and subsequently narrow the gap between the rich and poor in host economies. However, critics argue that other factors like legal restriction, cultural context, and investment risk could be more important than the ability to reduce transaction cost. In concurring, the economic geography of the internationalisation theory postulates that geographical location is the most important factor that determines the internalisation process of FDI activities (Caiazza & Ferrara, 2013). It argues that the proximity of the countries will enable the MNCs to maximise their resources and subsequently lower transaction cost.

Katz and Murphy (1992) used the supply and demand theory to explain changes in relative wage differentials. The supply and demand framework is built on an aggregated production function with K units of labour input. The corresponding demand for factors of production is expressed as:

$$X_t = D(W_t, Z_t), \quad (5.1)$$

where X_t is vectors of labour inputs in period t, W_t is the vector of market prices for labour inputs in the same period, and Z_t is vector of demand shifts variables. The demand shifts variables encompass technology, output demand and non-labour inputs. "Under the assumption that the aggregate production function is concave, the

$(K \times K)$ matrix of cross-price effect on factor demands, D_w , is negative semidefinite” (Katz & Murphy, 1992:47). Applying differential to equation (5.1) will yield:

$$dX_t = D_w dW_t + D_z dZ_t \quad (5.2)$$

The above semidefinite condition implies that variations in factor supplies and wages are inversely related so that:

$$dW'_t(dX_t - D_z dZ_t) = dW'_t D_w dW_t \leq 0 \quad (5.3)$$

According to Katz and Murphy (1992), variations in wages are attributed to changes in factor demand. The link between FDI and income inequality could therefore arise from factor markets. The implication of demand for labour by MNCs is the resulting increase/decrease in relative wages.

Contrary to the transaction cost theory, the internal organisation theory is of the view that a firm’s size and organisational behaviour plays a prominent role in the internationalisation decision of the firm. Literature reports that large retailers are more likely to use mergers and acquisitions as a mode of entry, whereas small firms often use low-risk strategies such as franchising (Caves, 2007).

Similar to the ambiguities within the theoretical grounds, empirical literature is also filled with mixed evidence on the impact of FDI on income inequality. For ease of exposition, empirical views have been classified into three groups. The first group consists of studies that support the hypothesis that FDI worsens income inequality. The second group entails studies that support the hypothesis of inequality reducing effects, whereas the third group presents those with a no-causation effect.

A number of studies support the view that FDI has negative effects on the income distribution of recipient economies (Reuveny & Li, 2003; Herzer & Nunnenkamp, 2014; Herzer, Huhne & Nunnenkamp, 2014; Mihaylova, 2015). Mihaylova (2015) examined the effect of FDI on income inequality in central and eastern Europe and found that FDI has led to an increase in income inequality. Similarly, Herzer and Nunnenkamp (2013) found supporting evidence that FDI exacerbated income inequality in the ten European countries examined. With reference to developing

countries, Tsai (1995) used a sample of 33 developing countries and concluded that FDI had increased income inequality in some of the Asian countries. This finding is consistent with that of Basu and Guariglia (2007) who used a panel study of 80 developing countries where FDI was reported to have promoted inequality. Similar findings were also reported by Reuveny and Li (2003) in their study of 68 countries, as well as by Choi (2006) in his study of 119 countries. The main finding from this stream of literature is that FDI is associated with increases in income inequality, relative wages and employment of skilled labour. The skill-bias outcome may promote wage inequality and could impede poverty reduction policies.

Empirical literature that focuses on the distributional aspects of FDI is very limited and almost non-existent in Africa (Haddad and Harrison, 1993; Mazundar, 1995; Te Velde & Morrissey, 2001). Haddad and Harrison (1993) examined the wage differentials between foreign-owned and domestic firms in Moroccan manufacturing firms and found that foreign firm paid 30% more. Mazundar (1995) did a similar study for Zambia and Cameroon and documented that foreign firms pay 18% and 24% percent more for Cameroon and Zambia respectively. This finding is consistent with Te Velde and Morrissey (2001) who found that foreign firms paid more wages in Cameroon, Ghana, Kenya, Zambia and Zimbabwe by 8%, 22%, 17%, 23% and 13% respectively.

The second stream of literature found supporting evidence that FDI had helped to decrease income inequality. Studies by Chintrakarn et al. (2012), Jensen and Rosas (2007), as well as Te Velde (2003) report that FDI has led to a decrease in income inequality for the United States, Mexico, and Latin America respectively. In the same vein, Figini and Görg (2011) examined the effect of FDI on income inequality in more than 100 countries. Their findings reveal that the effects of FDI on income inequality vary with the level of economic development. FDI has improved the distribution aspect of income in the developed countries examined. In contrast with developed countries, FDI has worsened income inequality in developing countries. However, there is supporting evidence that the relationship is non-linear. Although FDI has increased income inequality in developing countries, the non-linear term revealed that this effect has diminished with a further increase in FDI. This finding is

therefore consistent with the modernisation theory of FDI, where the effect of FDI is differentiated by the stage of development.

The third stream of literature found no significant relationship between FDI and income inequality. For instance, Te Velde and Morrissey (2004) did not find any supporting evidence that FDI has a strong influence on wage inequality in five Asian countries. Similarly, Milanovic (2002) and Sylwester (2005) did not find any robust links between FDI and income distribution. Given the debate in the literature and the mixed results in the few empirical studies, it is imperative to conduct further empirical studies to inform the theoretical issues and also to gain an understanding of FDI inequality links. Indeed there is the possibility of a non-linear relationship yet to be documented in Africa.

5.3 Methodology

5.3.1 Theoretical framework

The theoretical framework of this study is based on that of Katz and Murphy (1992) and Te Velde and Morrissey (2002). It builds on the assumption that the effect of FDI on wage inequality occurs through supply and demand for labour channels. The framework employs two factors of production [skilled (S) and unskilled labour (U)] in a constant elasticity of substitution (CES) production function:

$$f(U_t, S_t) = \{\lambda(\psi_{Ut} U_t)^\rho + (1 - \lambda)(\psi_{St} S_t)^\rho\}^{\frac{1}{\rho}}, \text{ where } \rho < 1 \quad (5.4)$$

where $\ln\psi_{Ut}$ and $\ln\psi_{St}$ are functions of unskilled and skilled labour efficiency units respectively. The substitution effect between unskilled and skilled labour is measured by $\sigma = 1/(1 - p)$. FDI is presumed to affect the labour efficiency index through its impact on the level of human capital and skill-specific technology. Therefore, the labour index is a function of FDI stock and the time trend component so that we obtain,

$\phi_{Ut} = \zeta_{1U}t + \zeta_{2U}fdi$; $\phi_{St} = \zeta_{1s}t + \zeta_{2s}fdi$, Where, $\phi_{Ut} \equiv \ln\psi_{Ut}$ and $\phi_{St} \equiv \ln\psi_{St}$
After substitutions, the wage of skilled labour relative to non-skilled labour is derived from the first-order condition, where factor productivity equates to real wage so that,

$$\ln\left(\frac{w_{St}}{w_{Ut}}\right) = \ln\left(\frac{1 - \lambda}{\lambda}\right) - \frac{1}{\sigma} \ln\left(\frac{S_t}{U_t}\right) + \frac{\sigma - 1}{\sigma} \zeta_1 t + \frac{\sigma - 1}{\sigma} \zeta_2 fdi_t + \varepsilon_t \quad (5.5)$$

where $\zeta_1 = \zeta_{1S} - \zeta_{1U}$ and $\zeta_2 = \zeta_{2S} - \zeta_{2U}$. Equation 5.5 suggests that wage inequality is a function of quantity of skilled labour employed, time trend and FDI. When $\zeta_2 > 0$, FDI leads to an increase in inequality, relative wages for skilled labour also increase.

This framework indicates that the channels through which FDI could impact on wage inequality can be explained in two ways. Firstly, FDI could affect wage inequality through its effects on relative demand/supply of the factors of production. Second, FDI may also impact on wage inequality through relative factor returns. In this case the resulting dynamics will have an influence on income inequality of recipient economies, which this study is trying to address. The following empirical model (Equation 5.2) will be estimated:

$$Gini_{it} = \alpha_{it} + \beta_{1,it} FDI_{it} + \beta_{2,it} FDI_{it}^2 + \beta_{3,it} X'_{it} + \varepsilon_{it}; \varepsilon_{it} = \delta_t + \xi_{it} \quad (5.6)$$

where Gini denotes the income inequality index measured by Gini net. It represents estimates of the Gini index of inequality in equivalised household disposable income (after tax and transfers). FDI = stock of Foreign Direct Investment, while FDI^2 is the quadratic term of FDI that captures the possibility of a non-linear relation between income inequality and FDI. Following Lee, Kim and Cin (2013), a possible U-curve relationship between FDI and inequality is expected, where an increase in FDI will reduce inequality ($\beta_{1,it} < 0$) until a point where further increases start increasing inequality ($\beta_{2,it} > 0$). However, following Aghion, Howitt and Violante (2002), Figini and Görg (2011), and Ucal, Bilgin and Haug (2014), the relationship could also be an inverted U-shape where FDI will first worsen income inequality ($\beta_{1,it} > 0$), with such effect diminishing after a turning point ($\beta_{2,it} < 0$).

The turning point of the quadratic relationship, is estimated by using partial derivatives with respect to FDI:

$$\frac{d\text{gini}}{dfdi} = \beta_{1,it} + 2(\beta_{2,it})FDI_{it} \quad (5.7)$$

Equation 5.7 will yield the marginal effects of a given value of FDI on income inequality. The turning point at which the effects of FDI switch from positive to negative and vice versa generally is attained at a point where slope will be zero. Subsituting zero for the slope and solving for FDI will yield the following turning point:

$$FDI_{it} = \frac{-\beta_{1,it}}{2(\beta_{2,it})} \quad (5.8)$$

When the relationship is non-linear, the concavity/convexity is determined by the sign of $\beta_{2,it}$. If the sign of $\beta_{2,it}$ is negative, the relationship is concave. Similary a postive $\beta_{2,it}$ implies a convex relationship.

In Equation 5.6, X is a vector of other control variables used in this study, for example, GDP per capita, gross primary school enrolment rate as a measure of education, and domestic credit to the private sector to capture financial development. According to Aghion et al. (2002), an increase in economic activity (GDP per capita) will ultimately improve the distribution aspect of the economy. Conversely, this relationship may not hold if economic activity does not lead to broad-based (pro-poor) growth. Furthermore, the Kuznets hypothesis argues that during the transition period, economic growth may increase income inequality. However, economic growth will eventually improve the equal distribution of income after the transition period. Similarly, the consequence of financial development can take any sign. Demirgüç-Kunt and Levine (2009) report that financial development could affect income inequality through the labour market. Inequality will worsen if financial development results in skill-biased employment. However, inequality will improve if financial services engage low-skilled labour. Education is often included to ensure the availability of skills in the labour market. An increase in education is expected to increase the supply of skilled labour. This will increase the relative supply of skilled labour and subsequently reduce income inequality (Figini & Görg, 2011). Education is therefore expected to have a negative sign.

5.3.2 Modelling approach

There has been recent development on how to model different panel data methodology in the best possible way. It is argued that when N (cross-section unit)

and T (time period) are relatively larger (macro panel), the traditional assumption of homogeneity slope parameters may not be correct (Pesaran & Smith, 1995; Im, Pesaran & Shin, 2003; Blackburne & Frank, 2007). Therefore, failure to account for heterogeneity in macro panel methods may yield inconsistent estimates (Pesaran & Smith, 1995). Panel models with small cross-sectional units and a large time dimension can also be better handled within Seemingly Unrelated Regression Equations (SUREs). However, the application of SURE models to panel data with larger cross-sectional units has been reported to lack practical feasibility and this has triggered the search for unobserved factor models (Kapetanios, Shin & Snell, 2006).

The vast majority of existing ‘macro panel’ empirical studies’ literature is silent on time series properties of the data in terms of cross-sectional dependency and unit root processes. Pesaran (2006), Eberhardt and Teal (2011), as well as Kapetanios, Pesaran and Yamagata (2011) argue that assuming cross-section independence when it is not present will also generate inconsistent parameters and invalidate the resulting inferences.

In this light, this paper addresses the potential problems of heterogeneity in the short-run slope coefficients and cross-sectional dependence by using the PMG estimator by Pesaran, Shin and Smith (1999). The PMG estimator is an intermediate technique that lies between macro and micro panels by essentially pooling and averaging the parameters. The novelty of the PMG estimator lies in its ability to allow for heterogeneity in the intercepts, short-run coefficients and error variances for all cross-sectional units while maintaining homogeneity assumption for long-run slope parameters (Pesaran et al., 1999).

Following Pesaran et al. (1999), the general specification of the PMG estimator is expressed by the following $ARDL(p, q, q \dots, q)$ model (Equation 5.3):

$$y_{it} = \sum_{j=1}^p \lambda_{ij} y_{i,t-j} + \sum_{j=0}^q \delta'_{ij} X_{i,t-j} + \mu_i + \varepsilon_{it} \quad (5.3)$$

where: $i = 1, 2, \dots, N$ and $t = 1, 2, \dots, T$

Subscripts ‘ t ’ and ‘ i ’ denote time dimension and cross-sectional units respectively, y_t captures the dependent variable, X_t is the vector of the regressors, μ_i captures fixed effect, λ_{ij} , δ'_{ij} are parameters to be estimated, and ε_{it} is the usual stochastic error term. The error correction model (ECM) equation is given by Equation 5.4:

$$\Delta y_{it} = \phi_i \left(y_{i,t-1} + \frac{\beta_i}{\phi_i} X_{it} \right) + \sum_{j=1}^{p-1} \lambda_{ij}^* \Delta y_{i,t-j} + \sum_{j=0}^q \delta_{ij}^{*'} \Delta X_{i,t-j} + \mu_i + \varepsilon_{it} \quad (5.4)$$

where, $\phi_i = -(1 - \sum_{j=1}^p \lambda_{ij})$, $\beta_i = \sum_{j=0}^q \delta_{ij}$, $\lambda_{ij}^* = -\sum_{m=j+1}^p \lambda_{im}$ ($j = 1, 2, \dots, p-1$) and $\delta_{ij}^* = -\sum_{m=j+1}^q \delta_{im}$ ($j = 1, 2, \dots, q-1$)

The main advantage of Equation 5.4 is its ability to capture both short-run and long-run dynamics. The parameter ϕ_i captures the speed of adjustment; the long-run relationship condition is that ϕ_i must be negative and also statistically significant. Similarly, the long-run relationship is given by $\left(y_{i,t-1} + \frac{\beta_i}{\phi_i} X_{it} \right)$. In the absence of a long-run relationship, the parameter ϕ_i will be equal to zero. Finally, the homogeneity restriction of the long-run coefficient is imposed as such that $-\frac{\beta_i}{\phi_i}$ stays the same \forall_i to obtain (Equation 5.5):

$$\Delta y_{it} = \phi_i (y_{i,t-1} + \theta X_{it}) + \sum_{j=1}^{p-1} \lambda_{ij}^* \Delta y_{i,t-j} + \sum_{j=0}^q \delta_{ij}^{*'} \Delta X_{i,t-j} + \mu_i + \varepsilon_{it} \quad (5.5)$$

where $\theta = \theta_i = -\frac{\beta_i}{\phi_i} \forall_i$

5.3.3 Data sources and description

The paper tested the impact of FDI on income inequality in a panel of 16 African countries from 1980–2013. Countries that are included are: Botswana, Cameroon, Côte d'Ivoire, Egypt, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Morocco, Nigeria, Sierra Leone, South Africa, Tanzania, Tunisia, and Zambia. The choice was mainly driven by data availability. Table 5.1 below gives a summary of data sources and description

Table 5.1: Data sources and description

Variables	Description	Data sources
Gini net index	Gini net represent estimates on income Gini index of inequality in equivalised household disposable income	SWIID
Foreign direct investment	Inward FDI stock ratio to GDP	UNCTAD
GDP per capita	Annual real GDP per capita	Africa development indicator (ADI)
Education	Gross primary school enrolment rate	ADI
Financial Development	Domestic credit provided by the financial sector (% of GDP)	ADI

5.4 Empirical results and interpretations

To ensure robustness in estimates, it is important that the time series properties of the data are evaluated. The unit root process of the data was examined by using the Im, Pesaran and Shin (IPS) panel unit root test. The IPS test was deemed appropriated owing to its ability to account for heterogeneity across the panel units. Table 5.2 shows the results of the IPS test. The depended variable is I (0) while all the regressors are I (1). Therefore, most of the variables become stationary after first differencing.

Table 5.2: Descriptive statistics

Variable	Obs	Mean	Std Dev.	Min	Max	CV
Foreign direct investment	512	4.485	1.820	3.246	12.098	40.58
GDP per capita	512	6.76	1.04	4.709	8.832	15.38
Gini index	467	3.791	0.251	2.944	4.262	6.62
Education	512	3.123	1.604	1.36	4.83	51.36
Financial development	512	3.35	1.15	0.301	4.574	34.33

Source: Author's computation based on the SWIID, UNCTAD and World Bank databases

Where CV measures coefficient of variation, calculated as $(std. dev / mean)$. Table 5.2 reports the descriptive statistics in log form for all the variables. For comparative purposes, coefficient of variation is used to interpret the relative magnitude of standard deviation. Education has the highest coefficient of variation, followed by foreign direct investment, while the Gini index reported the lowest variations.

Table 5.3 reports the IPS panel unit root test results. Most of the variables are stationary at first difference with the exception of the Gini index that is stationary at levels.

Table 5.3: Panel unit root test

Variable	IPS -level		IPS-first diff.	
Gini index	-2.6994 ***	(0.0035)		
Foreign direct investment	9.1584	(1.000)	-8.4246***	(0.0000)
Financial development	3.2153	(0.9993)	-16.1690***	(0.0000)
GDP per capita	2.6262	(0.9957)	-8.0742***	(0.0000)
FDI quadratic term	012.1197	(0.5248)	-2.7174***	(0.0033)
Education	-2.2057	(1.0000)	-6.3175***	(0.0000)

Where *** denotes 1% significance level

Source: Author's computation based on the SWIID, UNCTAD and World Bank databases

Table 5.4 shows the estimates of the PMG estimator. The PMG model reports both short-run and long-run dynamics; however, the emphasis is placed on the long-run estimates and the error correction term that shows the co-integration property. Where ECT is an error correction term, D.FDI is the differenced values foreign direct investment, L.FDI is the lagged values foreign direct investment, D.FDI² and L.FDI² are the differenced and lagged values of the quadratic term of FDI, D.RGDP and L.RGDP denote differenced and lagged values of real GDP per capita, whereas D.Education and L.Education represent the differenced and lagged values of the education measure. Similarly, D.Financial dev and L.Financial dev denote the differenced and lagged values of financial development.

Table 5.4: Empirical results

Variable	<i>Short-run parameters</i>			
	Equation 1	Equation 2	Equation 3	Equation 4
ECT	-0.057** (0.0250)	-0.105** (0.0525)	-0.0641* (0.0338)	-0.045** (0.0233)
D.FDIR	-0.118* (0.0623)	-0.0812 (0.0783)	-0.0701 (0.0842)	-0.17*** (0.0600)
D.FDI ²		0.548 (0.935)	0.565 (1.153)	1.673 (1.347)
D.RGDP		-0.501 (1.986)	-0.595 (2.347)	1.064 (2.163)
D.Education			0.0134 (0.0113)	0.0179 (0.0135)
D.Financial dev				-7.77e-05 (0.00618)
<i>Long-run parameters</i>				
	Equation 1	Equation 2	Equation 3	Equation 4
L.FDIR	0.257*** (0.0644)	-0.282*** (0.0788)	-0.338*** (0.100)	-0.484*** (0.187)
L.FDI ²		4.955*** (1.166)	2.443*** (0.940)	6.154*** (1.672)
L.RGDP		1.947 (2.914)	17.56*** (4.183)	59.42*** (6.947)
L.Education			-0.0683*** (0.0243)	0.0747*** (0.0261)
L.Financial dev				-0.253*** (0.0405)
Constant	1.611* (0.889)	-0.103 (0.271)	-5.541* (3.183)	-17.84* (9.228)
Turning point		2.84%	6.91%	3.93%
Observations	421	421	421	421

*Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1*

Source: Author's computation based on the SWIID, UNCTAD and World Bank online databases

Equation 1 represents a single regression model where the FDI ratio to GDP on income inequality was regressed. The short-run parameter reveals that FDI has

reduced income inequality; however, this effect will diminish in the long run where FDI is associated with widening income inequality. It is important to note that the magnitude of the long-run coefficient is much higher than its short-run counterpart. Even if FDI reduces income inequality in a short run, it is most likely that it will be eroded in the long run so that the net effect will not support the inequality reduction hypothesis.

In Equation 2, the quadratic term to capture the non-linear hypothesis and GDP per capita for economic activity has been added. FDI does not have a significant impact on inequality in the short run. However, in the long run it was found that FDI initially reduces inequality, but there is a turning point after which further increases in FDI will widen income inequality. The turning point is estimated to be 2.8%. It implies that when the inward FDI stock ratio to GDP rises beyond 2.8, it will exacerbate income inequality. In Equation 3 education was considered and a similar U-shaped relationship between FDI and inequality in the long run was found. The turning point is estimated at 6.91%.

After controlling for education, the finding is consistent with the prior expectation that education will reduce income inequality while GDP worsens. However, after controlling for financial development, there is no supporting evidence that education improves income inequality. This could indicate a clear case of growth and technological progress which is not pro-poor. Finally, in Equation 4, financial sector development was also considered, and more interesting results emanated. In the short run, FDI does reduce inequality. However, the U-shape relationship between FDI and inequality in the long run does persist. Findings on the U-shaped relationship between FDI and inequality in the long run are therefore robust, even after considering education and financial development in Equation 3 and Equation 4 respectively. Financial development has improved income inequality, while both education and GDP per capita are associated with worsening inequality. Theoretically, education is expected to improve the distribution aspect of any economy; however there is no robust evidence that this holds for Africa.

The U-shape effect of FDI requires some more intuitive explanation. In accordance with Reuveny and Li (2003), Herzer and Nunnenkamp (2011), Herzer et al. (2014)

and Mihaylova (2015), FDI may have resulted in skill-biased employment that further increases the gap between the rich and poor. It could also suggest that FDI may be dominated by resource-seeking FDI that is exploitative in nature and creates limited linkages with the entire economy. Moreover, income inequality may further worsen if mergers and acquisitions as opposed to greenfield investment dominate FDI activities. Therefore, the type (greenfield or mergers and acquisition) and the nature (resource or market seeking) of FDI activities can also influence the distributional effect of FDI. Accordingly, Feenstra and Hanson (1997), Cornia (1999) and Herzer and Nunnenkamp (2011) further argue that although FDI may be beneficial for economic development, there is great concern that FDI may also widen skill inequality and exacerbate income inequality.

Africa's case appears to be similar to the aforementioned empirical arguments, where economic growth has been increasing on average, but income inequality is one of the highest in the world. It is therefore not surprising that FDI as a developmental policy instrument has worsened income distribution in the countries that have been examined. This is consistent with the dependency and world-systems theory that argues that inequality will increase when the development process of developing countries is driven by highly industrialised MNCs. This will happen as long as African countries remain dependent on MNC activities that engage in capital-intensive production (Girling, 1973).

With reference to the short-run dynamics, the sign of the error correction term is negative as expected and it is statistically significant. This implies that any shock to the system is temporary and variables will converge to their long-run equilibrium level, although the speed of adjustment is quite slow.

5.5 Conclusion and policy implications

This paper examined the effect of FDI on income inequality in 16 African countries. Studies that make provision for heterogeneity and the possibility of a non-linear relation between FDI and income inequality are not fully established in Africa. To check for potential heterogeneity and the unit root process, a PMG model that accounts for non-stationary and heterogeneous panels was employed. A U-shaped

effect of FDI on inequality is documented. This implies that the relation between FDI and income inequality in Africa is characterised by a U-shaped curve. The linear component shows that FDI improves equal distribution of income in the countries that have been examined. However, after checking for the non-linear relation, this effect has diminished. There is robust evidence that the relationship is non-linear. It can therefore be concluded that although FDI improves the distributional aspect of the economy, there is a diminishing effect where a further increase in FDI will exacerbate income inequality.

The findings are worth noting; other literature has suggested that FDI to Africa is often biased towards extractive industries (resource driven) and the services sector that are inherently capital intensive and skill biased (Girling, 1973; Asiedu, 2002; UNCTAD, 2015). This has several implications in terms of creating sufficient backward linkages with the domestic economy. FDI in capital-intensive industries does not address income inequality (Aitken, Harrison & Lipsey, 1996; Te Velde & Morrisey, 2001; Te Velde 2003; Jaumotte et al., 2013). Policy strategies that are geared towards investment in human capital could serve as an adjustment mechanism to ultimately increase the supply of skilled labour. The resulting increase in human capital combined with the spillover effect in terms of backward and forward linkages has great potential to invert the current U-shaped curve. Based on the above empirical findings and the existing literature, there is reason to believe that it is beneficial to encourage FDI that targets both ends of the labour market.

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CHAPTER 6

CONCLUSION AND POLICY RECOMMENDATIONS

6.1 Introduction

The dissertation is structured in three papers that aim to examine how FDI translates into social welfare functions in Africa. A set of both one-dimensional and multifactor, as well as monetary and non-monetary welfare indicators, has been used to assess the underlying dynamics. Although FDI has been used as a policy instrument to address Africa's developmental agenda, a more comprehensive multi-dimensional framework has not been adequately addressed in Africa. Therefore, the three essays focus on Africa's pertinent issues of social welfare, human capital development, and the distributional effect of FDI.

To ensure robust and consistent estimates, this study has employed a sequence of estimation techniques that are robust to non-stationary panel models with heterogeneous slopes, endogeneity, and cross-sectional and spatial dependency. The traditional panel models will yield misleading inferences when the assumptions of homogeneity and cross-sectional independence are violated. Therefore, most of these methodological concerns have been addressed, which according to the knowledge of the author, have not been properly captured in the existing literature about Africa.

In this regard, this dissertation contributes uniquely to existing literature by using both multifactor and non-monetary measures of economic development. Poverty/welfare has been reported to be a multi-dimensional phenomenon; hence, using a one-dimensional measure will not adequately capture the underlying dynamics. Similarly, the metric measure of welfare is often criticised for not capturing the equity aspects of development embedded in the non-monetary indicators. The first paper examines the impact of FDI on several welfare indicators. Its contribution to the existing corpus of literature offers three variations. First, the study employs both one-dimensional and multifactor welfare indicators to adequately capture the nexus between FDI and economic welfare. Second, the effects of FDI on both monetary and non-monetary indicators of welfare are explored. Non-monetary indicators play a prominent role in detecting omitted attributes of welfare that are embedded in a broader goal of

economic development. Third, we have relaxed the assumption of non-linear marginal effects of FDI spillover. Most studies impose a linearity assumption; however, other scholars purport that the effect of FDI is not always linear and could exhibit a curvilinear pattern.

The second paper aimed to investigate the roles that FDI could play in enhancing human capital development in Africa. Drawing predominantly from endogenous growth theories, it has been examined how FDI impacts on disaggregated levels of human capital (primary, secondary and tertiary) by using the UNESCO Institute for Statistics (UIS) database of educational attainment. Efforts to improve educational levels are critical for Africa's developmental agendas. Africa is faced with a policy challenge on how to translate FDI activities into boosting the formal education of its workforce. The key contribution of this paper is two-fold. Firstly, the disaggregated levels of educational attainment were examined, and secondly, heterogeneous slope coefficients, cross-sectional dependency and endogeneity that may exist to ensure consistent estimates were accounted for.

The development process of Africa is inherently characterised by the challenge of how to harness the current economic momentum into sustainable and inclusive development. Africa has recently recorded an increase in inequality; the gap between the rich and poor has worsened over the past decade. Reducing inequality is vital for achieving MDGs and broad-based development. Furthermore, the distributional aspect of economic development is particularly important to Africa, where within and across countries income inequality is predominantly high. Therefore, in the third paper the impact of FDI on income inequality has been examined by capturing both linear and non-linear aspects of the underlying relationships.

6.2 Summary of the findings

Overall, the findings from this study reveal that there are several channels through which FDI could transmit into social welfare indicators. The impact of FDI on economic welfare was more prominent when a non-monetary welfare indicator was employed. With regard to human capital development, FDI is found to exhibit significant links with all levels of education. However, although some welfare

indicators have supported the FDI welfare-enhancing hypothesis, there is strong evidence that FDI is responsible for Africa's widening income inequality.

In particular, the findings from the first paper indicate that both multi-dimensional and monetary indicators employed reveal that FDI could lead to welfare enhancement; however, there is a turning point after which further increases in FDI may not translate into welfare gains. The net effect is therefore determined, but the magnitude of the resulting gains should be balanced vis-à-vis the welfare loss. Notably, FDI became more robust in enhancing welfare when the health non-monetary indicator was used. There is sufficient evidence that FDI has led to a decrease in the undernourished population of the countries examined. The limited link between FDI and the multidimensional welfare indicator could be attributed to a higher concentration of FDI in extractive industries that are highly capital intensive. It could also arise from Africa's weaker manufacturing sector that has failed to absorb the backward and forward linkages from FDI activities.

Subsequently, the findings from the second paper reveal that the impact of FDI on human capital development measured as primary, secondary and tertiary enrolment rates, differs across various levels. After considering aspects such as infrastructure, standard of living and the size of the economy, the study reveals that FDI has a negative but transitory effect on human capital development. The quadratic term of FDI shows a positive effect, an indication that there is a turning point after which the human capital augmenting hypothesis is supported. Moreover, FDI spillovers are greater for high-income countries when compared with low-income countries.

On the distributional aspect of FDI, the third paper reveals that FDI is responsible for widening income inequality in the country that has been examined. After assessing a non-linear effect and heterogeneity, the linear term shows that FDI will first improve income inequality, but only until a certain turning point, after which a further increase in FDI will exacerbate income inequality.

6.3 Conclusion

The overall conclusion from the findings in this study implies that poverty/welfare issues are multidimensional in nature. The type of welfare indicator (one-dimensional vs. multifactor; monetary vs. non-monetary) will have several implications on the resulting relationship. The transmission mechanisms through which FDI could transmit into social welfare functions and address Africa's developmental agenda depend on many factors, as well as initial conditions of the underlying economies. The link between FDI and social welfare indicators is more prominent when non-monetary indicators are employed. Therefore, studies that only concentrate on monetary indicators may therefore miss the underlying relationships. Similarly, FDI enhanced all three levels of education employed within the ambit of this essay. FDI is not a panacea, although it has resulted in some welfare gains. FDI is also responsible for Africa's widening income inequality. Hence, well-calibrated policy instruments need to be implemented to ensure that spillover from FDI activities is realised.

6.4 Recommendations

Africa has made progress in attaining some of the MDGs. However, poverty reduction remains a critical focus point of the post-2015 development agenda. The new SDGs underscore the importance of tackling the issues of welfare and income inequality. According to this study, international business in terms of FDI could play an important role in addressing Africa's broad-based economic development. However, to ensure the optimal benefit of FDI spillover, Africa needs to put in place adequate policy measures and create a conducive environment for spillover benefits.

To accelerate the pace of socio-economic development, Africa needs to create an incentive for international businesses' commitment to social and development impact. This can be done through integrating international business with host economies' social protection and safety nets that are linked to the national policy. Improvement in rural education, sanitation and health can serve as conditionality to MNEs.

To create a regulatory framework that enforces/induces corporate social responsibility, there is a need for a greater effort in order to establish regulation that

ensures commitment towards the community. Regulation will enhance consistency, continuity and optimal capitalisation of international business activities.

To harness the full benefits of international business activities, Africa should ensure that the initial host economy's conditions are met. Policies should be geared to improving human capital, institutions and infrastructure development in both rural and urban areas. Africa should also ensure that there is continuous inward FDI that will ultimately translate in welfare gains.

Considering that knowledge is of more importance in addressing capacity constraints, international business activities should be geared towards promoting both secondary and tertiary levels of education. This could be done through the provision of funding in the form of scholarships. It could also arise from formal/informal on-the-job training. Promoting private funding to both secondary and tertiary levels is needed to enhance skills development.

The extent to which international business activities translate into welfare gains is intrinsically linked to underlying industrial policies. A dynamic industrial base is needed to absorb both forward and backward linkages. The resulting linkages are critical in enhancing the value chain that will ultimately translate in improved social welfare.

Africa needs to explore the possibility of gearing FDI projects towards pro-poor establishments. Greenfield investments have a potential to crowds in domestic investment and subsequently improve the socio-economic welfare in the recipient economies. It could also take advantage of the booming services sector. The current boom in the services sector has the potential to generate more jobs and improve social conditions.

Africa's healthcare sector, one of the most welfare enhancing industry, is expected to enhance the optimal efficacy of international business activities. There is immense scope to gear FDI activities toward health services penetration in Africa. This presents an ample opportunity for socio-economic development that translate into welfare gains.

Africa should identify policy strategies that stimulate socio economic development opportunities from the health industry while simultaneously leveraging the benefits of welfare gains already underway. International business activities could be used to increase access to health care services. Establishments of priority services and affordability is vital for welfare gains. Africa should identify priority services, which are vital for improving quality of life. Moreover, it is also important to ensure that issues of affordability, quality and equity in the provision of health care related services are addressed.

Embracing social welfare is underpinned by leveraging inter-sectoral synergies within the host economies. Policy makers need to identify inter-sectoral synergies and harmonise them with FDI to enhance social welfare. Overall, Africa needs to design well-crafted national policies that ensure international businesses operate in a way that contributes to inclusive socio-economic development.