DETERMINANTS OF CHINA'S ECONOMIC ENGAGEMENT WITH OIL AND MINERALS EXPORTING AFRICAN COUNTRIES

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ABSTRACT

Many times, the engagement between China and Africa is stereotyped as an energy quest to sustain China's economic growth, leading to anti-Chinese narratives in Africa. Against this background, the observed presence of China in the top 18 oil/minerals exporting countries in Africa warrants special attention, as the strategic engagement has expanded significantly to emerge as a powerful, yet questionable, South-South alliance. In this study, the determinants of China's economic activities in Africa are derived through the three dominant economic linkages of trade, foreign direct investment (FDI) and aid/financial flows; using data over the period of 1992-2015. To achieve the objectives of this study, the UN-Comtrade trade data, based on the Harmonized System (HS) nomenclature is used to classify into agriculture, oil/minerals and manufacturing. The gravity model (GM), fixed effects (FE), Generalised Least Squares (GLS), Poisson Pseudo – Maximum Likelihood (PPML) and the Least Squares Dummy Variable (LSDV) estimators were deployed to analyse trade. The results indicate that China's oil/minerals imports are higher than in manufacturing and agriculture. Also, GDP, population and trade openness are determinants of trade. However, the distance between China and Africa reduced trade. Also, institutional quality (political instability and corruption), spur trade. In objective two, GLS and Instrumental Variable 2-Stage Least Squares (2SLS) were deployed to identify the imports sector(s) and other determinants of China's FDI stocks and flows. The results indicate that FDI stocks are less volatile than flows, but FDI flows have more explanatory power than FDI stocks. The results of FDI stocks indicate that oil/minerals and agricultural imports facilitate more stocks. While the institutional variable proxy of political instability has an overall negative and significant impact on FDI stocks. The results indicate a positive and strongest statistical significance on oil/minerals imports. Also, the institutional variable (political instability) shows a

negative, but significant relationship with imports. The third objective examines the determinants of China's foreign aid to Africa, and whether it is determined by altruism or by trade-benefits. These twofold objectives were carried out using China's bilateral loan data obtained from the China Africa Research Initiative (CARI). In the trade disaggregate data used, imports were used to examine the altruism motive for giving aid while disaggregated export data were used to analyse aid-for-trade-benefits. Using the FE, GLS and Pesaran dynamic fixed effects techniques, the results show that oil/minerals are not the determinants of aid in the two specified equations, however, aid is tied to China's manufacturing exports. The findings on the institutional variables (political instability and corruption) show that a decrease in political instability and corruption reduce China's aid. Related results apply to external debt and infant mortality rate as the analyses show that they are important determinants in China's bilateral aid considerations to Africa. The findings of this study should serve as recommendations for policymakers to improve trade policies that will enhance the sustainability of Africa's engagement with China.

Keywords: China, Africa, foreign direct investment, trade, foreign aid.

ABSTRAK

Banyak kali, penglibatan antara China dan Afrika distereotaipkan sebagai usaha tenaga untuk mengekalkan pertumbuhan ekonomi China, yang membawa kepada naratif anti-Cina di Afrika. Terhadap latar belakang ini, kehadiran China dalam 18 buah negara pengeksport minyak / mineral teratas di Afrika memberi perhatian khusus, memandangkan penglibatan strategik telah berkembang dengan pesat untuk muncul sebagai pakatan Selatan-Selatan yang kuat, dipersoalkan. Dalam kajian ini, penentu aktiviti ekonomi China di Afrika diperoleh melalui tiga hubungan ekonomi perdagangan dominan, pelaburan langsung asing (FDI) dan bantuan / aliran kewangan; menggunakan data sepanjang tempoh 1992-2015. Untuk mencapai matlamat kajian ini, data perdagangan Komrad UN-berdasarkan kepada tatanama Sistem Harmonized (HS) digunakan untuk mengklasifikasikan ke dalam pertanian, minyak / mineral dan pembuatan. Model graviti (GM), kesan tetap (FE), Generalized Least Squares (GLS), Poisson Pseudo - Maximum Likelihood (PPML) dan Penaksir Dummy Variable Dummy Variable (LSDV) digunakan untuk menganalisis perdagangan. Hasilnya menunjukkan bahawa import minyak / mineral China lebih tinggi daripada pembuatan dan pertanian. Juga, KDNK, penduduk dan keterbukaan perdagangan adalah penentu perdagangan. Walau bagaimanapun, jarak antara China dan Afrika mengurangkan perdagangan. Juga, kualiti institusi (ketidakstabilan politik dan rasuah), merangsang perdagangan. Dalam objektif dua, GLS dan Instrumental Variable 2-Level Least Squares (2SLS) telah digunakan untuk mengenal pasti sektor import dan penentu lain saham dan aliran FDI China. Hasilnya menunjukkan bahawa stok FDI kurang menentu daripada aliran, tetapi aliran FDI mempunyai lebih banyak penjelasan daripada saham FDI. Hasil saham FDI menunjukkan bahwa minyak / mineral dan impor pertanian memudahkan lebih banyak stok. Walaupun proksi berubah institusi ketidakstabilan politik mempunyai kesan keseluruhan negatif dan signifikan ke atas saham FDI. Hasilnya menunjukkan

kepentingan statistik positif dan terkuat terhadap import minyak / mineral. Juga, pembolehubah institusi (ketidakstabilan politik) menunjukkan hubungan negatif tetapi signifikan dengan import. Objektif ketiga meneliti penentu bantuan asing China ke Afrika, dan sama ada ia ditentukan oleh altruisme atau manfaat perdagangan. Objektif dua belas ini dijalankan menggunakan data pinjaman dua hala China yang diperoleh daripada Inisiatif Penyelidikan China Africa (CARI). Dalam data perdagangan yang dipisahkan yang digunakan, import digunakan untuk mengkaji motif altruisme untuk memberi bantuan sementara data eksport yang dipisahkan digunakan untuk menganalisis manfaat bantuan untuk perdagangan. Dengan menggunakan teknik-teknik kesan tetap dinamik FE, GLS dan Pesaran, hasil menunjukkan bahawa minyak / mineral bukanlah penentu bantuan dalam dua persamaan yang ditentukan, walau bagaimanapun, bantuan berkaitan dengan eksport perkilangan China. Penemuan mengenai pembolehubah institusi (ketidakstabilan politik dan rasuah) menunjukkan bahawa penurunan ketidakstabilan politik dan rasuah mengurangkan bantuan China. Hasil berkaitan berkaitan dengan hutang luar negeri dan kadar kematian bayi kerana analisis menunjukkan bahawa mereka adalah penentu penting dalam pertimbangan bantuan dua hala China ke Afrika. Penemuan kajian ini harus menjadi saranan bagi penggubal dasar untuk meningkatkan dasar perdagangan yang akan meningkatkan kelestarian penglibatan Afrika dengan China.

Kata kunci: China, Afrika, pelaburan langsung asing, perdagangan, bantuan asing.

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LIST OF SYMBOLS AND ABBREVIATIONS

2SLS	:	Two-Stage Least Squares
ADBC	:	Agricultural Development Bank of China
ADF	:	Augmented Dickey Fuller
AERC	:	African Economic Research Consortium
AFDB	:	African Development Bank
AU	:	African Union
CADF	:	Cointegration Augmented Dickey Fuller
CARI	:	China Africa Research Initiative
CDB	:	China Development Bank
CIF	:	Cost Insurance and Freight
CSR	:	Cooperate Social Responsibilities
D-8	:	Organization for Economic Cooperation, also known as Developing-8
DAC	:	Development Assistance Committee
DR Congo	:	Democratic Republic of the Congo
ELGH	:	Export-led growth hypothesis
EU	:	European Union
FDI	:	Foreign Direct Investment
FE	:	Fixed effects
FOB	:	Free on Board
FOCAC	:	Forum for China-Africa Cooperation
GDP	:	Gross domestic product
GDP per capita	:	Gross domestic product (per capita)

GLS	:	Generalised Least Squares
GM	:	Gravity model
GMM	:	Generalized method of moments
GNP	:	Gross national product
GPI	:	Gender parity index
HIPC	:	Heavily Indebted Poor Countries
HIPC	:	Heavily Indebted Poor Countries
H-O	:	Eli Heckscher and Bertil Ohlin
HOS	:	Heckscher-Ohlin-Samuelson
HS	:	Harmonized System
IMF	:	International Monetary Fund
ITC	:	International Trade Centre
IV	:	Instrumental Variables
LA	:	Latin America
LDC	:	Less developing countries
LM	:	Lagrange Multiplier
LSDVC	:	Least Squares Dummy Variable
MDGs	:	Millennium Development Goals
ME	:	Middle East
MNC	:	Multinationals corporations
MOFCOM	:	Ministry of Commerce, China
NTT	:	New Trade Theory
ODA	:	Official development assistance
OECD	:	Organisation for Economic Co-operation and Development
OFDI	:	Outward Foreign Direct Investment
OIC	:	Organization of the Islamic Conference

OLS	:	Ordinary Least Squares
OOF	:	Other Official Flows
PCSE	:	Panel Corrected Standard Errors
PMG	:	Pooled Mean Group
POLS	:	Pool Ordinary Least Squares
PPML	:	Poisson Pseudo Maximum Likelihood
PRC	:	People's Republic of China
RE	:	Random effects
RMSE	:	Root Mean Squared Error
SA	:	South Africa
SAP	:	Structural Adjustment Programme
SEZ	:	Special Economic Zone
SITC	:	Standard International Trade Classification
SME	:	Small and Medium Enterprises
SOE	:	State Owned Enterprises
SSA	:	Sub-Saharan Africa
RTA	:	Regional Trade Agreement
TAZARA	:	Tanzania-Zambia Railway
TNC	:	Transnational Corporations
Tralac	:	Trade Law Centre is a capacity-building organisation
U.S.A.	:	United States of America
UK	:	United Kingdom
UN	:	The United Nations
UNComtrade	:	The United Nations Commodity Trade Statistics Database
UNCTAD	:	United Nations Conference on Trade and Development

VAR	:	Vector Autoregression
WB	:	The World Bank
WGI	:	World Governance Indicators
WTO	:	World Trade Organisation

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CHAPTER 1: INTRODUCTION

1.1 Background of the Study

In the two last decades, China has emerged as one of the largest global economies. This feat followed its change from a centrally planned economic system, which was to a great extent not open "to international trade, to a more market-oriented economy" (Ajakaiye, 2006p. 2; Alden & Davies, 2006; Cheong, 2009; Li & Cheong, 2019). The dramatic change in China from a poor developing country to one of the world economic powers to reckon with has gained the attention and admiration of many developed and developing countries (Renard, 2011). China's success is attributed to the liberalisation of prices, fiscal decentralisation, state enterprises autonomy, diversified financial system, cautiously controlled exchange rate, high foreign exchange reserves, the rapid expansion of the government sectors, the openness of international trade, investments and economic cooperation (Ajakaiye, 2006). Thus, China's liberalised economy has impacted on all other economies of the world, mostly the developing nations in Latin America, Africa and Asia through its major and diverse sources of enormous trade, investment and international aid channels, which serves as an alternative to these regions' traditional development partners. The channels of trade, foreign direct investment and foreign aid in international economic and political relations are the primary commercial and political interaction among countries (Biggeri & Sanfilippo, 2009; Gold & Devadason, 2018; Nissanke, 2013).

Of importance amongst the three regions is China's expansion of its economic prowess to African continent that has gained prominence in development literature (Alden & Davies, 2006; Carmody, 2009; Edwards & Jenkins, 2014; Hanusch, 2012; Jenkins & Edwards, 2006a, 2006b; Taylor, 2006; Wang, 2007). The Chinese renewed engagement since the early 1990s with Africa is becoming entrenched in 'powerful market dynamics' (Eisenman, 2012). Thus, this places China as the third exporter of manufacturing ahead

of the United States of America (U.S.A.) and several other countries in 2007 (Giovannetti & Sanfilippo, 2009). By 2012, China becomes the second largest exporter of manufacturing for Africa (Hu & Van Marrewijk, 2013) and by 2015, China turns out to be Africa's biggest trade partner (Johnston, Morgan, & Wang, 2015), as well as one of the major importers of oil and gas, agricultural commodities and minerals such as ore, metal, copper, iron and steel (Biggeri & Sanfilippo, 2009; Hu & Van Marrewijk, 2013; UN-Comtrade 2016). At the bilateral level, China has gone further by rapidly expanding its economic footprint in Africa through its massive exports of cheap manufactured products and services to African markets. While the Chinese exports benefit the local consumers and enhances their welfare, it poses a threat to the local production and crowd out Africans' manufacture (Edwards & Jenkins, 2014; Muhammad, Buba, Azman, & Ahmed, 2019; Muhammad, Buba, Yusuf, & Gold, 2018; Muhammad, Mansur, & Gold, 2017).

Likewise, about 40 per cent of the total, China's FDI to Africa goes into the resource-endowed countries like Nigeria, South Africa, Angola, Egypt, Congo, Sudan among others (Alabi, Adetunji, & Ogunkola, 2011; Bing & Ceccoli, 2013; Broich & Szirmai, 2014; Gold, Rasiah, & Kwek, 2019; Rasiah & Gachino, 2004; Rasiah, Gammeltoft, & Jiang, 2010; Shen & Fan, 2014; Taylor, 2015; Zafar, 2007). As a reflection of China's quest to sustain its economic growth and development, which requires the mobilisation of both domestic and foreign energy and raw materials, the pattern of the FDI inflows from China to Africa is skewed towards extractive industries. The FDI inflows are mainly from State-Owned Enterprises (SOE) driven by the state's interest in the minerals and oil sectors (Alden, 2012; Alden & Davies, 2006; Cheng & Ma, 2010; Cheru & Obi, 2011; Jauch, 2011). Indeed, the pattern of China's FDI in Africa captured the global imagination in 2006 to 2008 and was reported in UNCTAD database as well as trade statistics databases, which show that China imports were concentrated in oil and minerals (Alabi

et al., 2011; Taylor, 2007, 2015; Gold et al., 2019), making the resources endowed Africa's countries the top beneficiary of China's FDI outflows in the period 2003-2014. At the end of 2014, Chinese FDI flows destined for Africa, totalled US$24181.84million, while, its FDI stocks in Africa total US$136692.77millions in the same year 2014 (UNCTAD, 2014; Ministry of Commerce, 2017).

Also, China-linked its trade and investment with infrastructure development, foreign aid and granting of loans (known as economic cooperation) has been on the increase to about 50 African countries. This practice of aid to trade linkage is in consonance with the economics of aid objective of securing trade benefits through goodwill (Younas, 2008). Also, foreign direct investment is the equivalent of foreign aid invested in the form of physical capital (Selaya & Sunesen, 2012). Therefore, China gives support and builds vital infrastructure, such as railroads, hospitals, government buildings, roads, dams, power plants, and telecoms services in African countries which have diplomatic relations with Beijing instead of Taipei (Bräutigam, 2009; Edwards & Jenkins, 2014; Gold, Rasiah, Kian-Teng, Muhammad, & Yusuf, 2017; Zafar, 2007). These fast-growing economic engagements between China and Africa have led to the proliferation of Chinese companies and other multinational enclaves in the African continent (Mohan, 2013). Thus, the unprecedented rise in China´s economic relationship with Africa since the beginning of the new millennium can be related to four main factors. First, China in the pursuit of 'Going Global strategy' *(Zou chu Qu)* launched in 2003[1] (Alden, 2005; Biggeri & Sanfilippo, 2009); industrialization drive and massive inflow of FDI into the country led to fast-growing manufacturing economy which requires oil and minerals

[1] Beijing in its pursuit to accelerate its commitment to enter the World Trade Organisation (WTO), initiated the go global strategy in 1999 (launched formally in 2003) to encourage domestic enterprises expand beyond the home market, acquire foreign experience, compete globally and promote oversea investments (Li & Cheong, 2019).

inputs[2] (Alabi et al., 2011; Gold et al., 2017; Hanson, 2008), that is outstripping the country's domestic resources, hence, the need to source abroad including Africa (Kolstad & Wiig, 2011). Second, the formation of Forum for China-Africa Cooperation (FOCAC) in Beijing in the year 2000 with a follow-up forum held every three years to establish a fair and just international political order in the 21st century. Moreover, since the inception of FOCAC, Africa has remained the largest recipient of China's external aid (Gold et al., 2017; Kobayashi, 2013). Third, there was the subsequent accession of China into the World Trade Organization (WTO) in the year 2001 (Alden, 2012; Rasiah et al., 2010). Moreover, this period coincides with the time when China was rated as one of the world's topmost three recipients of foreign investment and then became the third global largest economy. Forth, the proposed Belt and Road Initiative (BRI) in 2013 by China to improve transportation connectivity, trade, foreign investment and overall cooperation on transcontinental scale includes African countries (Ruta et al., 2019). For instance, the 2019 official data from China indicated that some African countries that are located along the BRI corridors had signed agreements to collaborate with China for the growth and development benefits therein.

Nevertheless, China's relations with Africa have been 'stereotyped' (Mohan, 2013) as an energy quest[3] to sustain its economic growth, leading to anti-Chinese resistance narratives in Africa. Also, China has been alleged for capitalizing on Africa's weak institutional structures to export its manufactures in the available large market (Alabi et al., 2011; Alden, 2005; Alden, 2012; Alden & Davies, 2006; Bing & Ceccoli, 2013;

[2] China became second global leading importer of crude oil after the U.S.A. (Alden, 2005; Hanson, 2008). It is estimated that in the year 2030, China's need for oil will increase to 13.1 million barrels per day, this demand will amount to the entire oil produce in Africa and twice the production of Saudi Arabia (Kelley, 2012).

[3] At present, 30 per cent of China's energy is derived from Africa (Ayodele & Sotola, 2014) of which 70 per cent comprises crude oil (Kelley, 2012).

Edwards & Jenkins, 2014; Eisenman, 2012; Jauch, 2011; Oyejide, Bankole, & Adewuyi, 2009; Taylor, 2006; Zafar, 2007). Contrarily, the China-Africa win-win protagonists (Aguilar & Goldstein, 2009; Ajakaiye, 2006; Broich & Szirmai, 2014; De Grauwe, Houssa, & Piccillo, 2012; Giovannetti & Sanfilippo, 2009; Gu, 2009; Kaplinsky, 2013; Kaplinsky & Morris, 2009; Kragelund, 2009; Rasiah & Gachino, 2004; Renard, 2011; Shen, 2015; Vaschetto & Yin, 2011; Wu & Cheng, 2010) argue that China's presence has been beneficial, in terms of poverty reduction, improvement in gross domestic product (GDP) and prices of commodity exports in the global market. Also, its quest for agricultural and natural resources leads to favourable terms of trade and boosts Africa's economic development.

Consequently, this has placed the relationship under surveillance (Ayodele & Sotola, 2014; Hanusch, 2012), in which it has received divided attention of scholars, media and those in authorities in recent years, partly to evaluate the benefits, and the dangers inherent in their renewed relationship (Hanusch, 2012; Mawdsley, 2008). Although, the realities of the potential gains of China's relations with Africa remain contestable, and despite the negative perturbations of external influence on their domestic economies, bilateral relations have continued with several African countries who perceive China as a model for development, as well as an alternative to their traditional partners whose structure and patterns of engagements are tagged as exploitative (Kragelund, 2009; Renard, 2011). More specifically, the African oil and minerals[4] exporting countries engagement with China are one of such bilateral relations amongst several scores of bilateral ties established and designed to be of mutual benefit to the cooperating parties.

[4] The extractive sector is an important driver of the domestic economies, this sector accounts for about 85 per cent of foreign exchange earnings, and 90 per cent of their exports (Ogunkola, Bankole, & Adewuyi, 2008).

However, based on the track record of China's engagements in Africa, a study that will investigate the determinants, the potential benefits Africa oil/minerals exporting countries stand to gain from the partnership, and the trajectory of the influx of China's engagement becomes worthy. Furthermore, as the body of research grows, there is a need to examine sector-specific outcomes to align and mainstream such bilateral relationship with Africa's current development and challenges. Although previous studies of Biggeri and Sanfilippo (2009), Gold and Devadason (2018) and Zafar (2007) were able to identify China-Africa relations three linkages which are, trade, FDI and aid, the disaggregate products trade, the political undertones in terms of the quality of African institutions, the effect of infrastructure and per capita income, the actual bilateral China-Africa FDI flows and stocks and the actual Chinese loans on a bilateral basis were rarely examined. Most importantly, a rigorous econometric analysis is required to examine the impacts for both China's FDI and loan because there is no reliable data on Chinese bilateral investment and aid before the official launch of its 'going global strategy'. Likewise, empirical literature has neither focused on the oil and minerals African countries solely, nor analysed the determinants of the linkages using long-span standard and acceptable data in spite of several qualitative studies which pointed to the fact that Chinese engagement is concentrated in these countries and the importance of the study to both China and African economies. Rather, the arguments are on China's acquisition of Africa's primary commodities, the win-win or win-lose status of their relationship (Ado & Su, 2014) and the general opinion that one of the major attractions of China to Africa is the weak institutional structure of the region. In agreement to the above, Kolstad and Wiig (2012) are of the view that monitoring the evolution of Chinese investment through acceptable long-span data in more studies are required. Biggeri and Sanfilippo (2009) suggested future research on Chinese aid activities and FDI using non-partial data to have more comprehensive analysis and reliable results. Hence, this study attempts to examine the

determinants of Chinese trade, FDI and aid empirically. Specifically, the study examines the quality of the institutional structures of the region using political stability and absence of violence/terrorism index and control of corruption index to corroborate or negate the notion about China supporting pariah states and weak institutions nations in Africa because of resources and political relevance.

1.2 Problem Statement

Trade is considered as the catalyst and whirling engine for economic growth and development. This trade notion is engraved in the export-led growth hypothesis (ELGH) of Dreger and Herzer (2013), Maneschiöld (2008), Nayyar (2007), Sengupta and España (1994), Thornton (1996), Tyler (1981) and Zivot and Andrews (1992), and among others. Therefore, the role of exports to improve the growth potential of a country occupies a conspicuous space in development literature. Based on this notion, many countries in the world, Africa inclusive, have at one time or the other embarked on export promotion and increased openness, especially in this era of trade liberalisation. As a result, many African countries, have been witnessing a considerable improvement in economic growth, which varies significantly over time and in various countries. This significant increase in exports is more particular to countries that are bestowed with natural resources such as, crude oil, metals, iron ore, copper, and agricultural commodities. Therefore, trade in oil and minerals play a significant role in African countries with their different factor endowments and economic conditions.

Based on the natural resources deposited in many African countries, trade between China and Africa had grown in the past two decades, particularly since 1992. In 2007, China overtook Britain, U.S.A., Germany and France to become Africa's major trading partner. Consequently, the destination for Africa exports is China. In return, China exports low-cost and medium-cost manufacturing goods like plastic products, footwear,

clothing and textiles, machinery and transportation that is beneficial to consumers, but damaging to local production (Eisenman, 2012; Muhammad et al., 2018; Muhammad et al., 2017; Zafar, 2007). China exhibits a competitive advantage over Africa, despite its resources, and this has placed its relationship under scrutiny (Edwards & Jenkins, 2014). Furthermore, it is noticeable that China-Africa studies on trade have been focusing more on Chinese manufacturing exports (Edwards & Jenkins, 2014; He, 2013; Muhammad et al., 2017). Other studies of Biggeri and Sanfilippo (2009), Foad (2011) and Qian (2012) were concentrated on natural resources. However, the limitations in their studies include the use of a proxy that does not capture the actual trade flows of oil and minerals. Secondly, their studies focus either on entire Africa as a region, Sub-Saharan Africa (SSA) or a combination of Africa with other developed and developing region in the world. Hence, merging countries with different economic conditions with African oil/minerals endowed region leads to bias estimation (Blonigen & Wang, 2004; Cheng & Ma, 2010). Therefore, it is essential to analyse the possible institutional, socioeconomic, and geographical variables that trigger this trend between China and Africa using disaggregated trade categorised into three classifications, oil/minerals, agriculture and manufacturing. Also, there is a need to identify the macroeconomic variables that will provide powerful effects in facilitating China-Africa bilateral trade. Identifying the variables that determine their relationship is crucial, as it would help to ensure new suggestion of strategy for African oil/minerals exporting country's policymakers and draw further implications to enhance the sustainability of trade between China and Africa.

Furthermore, having realised the benefits of foreign direct investment (FDI), mainly as it serves as one of the most striking elements of today’s globalisation push, especially as it brings in Greenfield ventures, and the conscious encouragement of cross-border investments of multinationals corporations (MNC) and transnational corporations (TNC), international organisations and other external advisors have therefore strongly

recommended that developing countries and less developing countries (LDC) should rely primarily on FDI (which is less volatile), for external finance. FDI is superior to other kinds of capital inflows in stimulating global economic growth. This is because foreign investment is a combination of technology, capital, management and marketing channels to spread economic development from developed countries to developing countries and LDC (Gold et al., 2019; Nayyar, 1978; Nunnenkamp & Spatz, 2003; Rasiah et al., 2010).

Also, it has been argued by Caves (1974), Hirschman (1980) and Rasiah (1995) that FDI has the greatest potential to stimulate spillover for domestic firms through demonstration effects, and technology transfer. However, the realisation of linkages of such potential depends on the interventions to strengthen the institutional environment at host sites (Rasiah, 1995). Therefore, Africa as a region depends very much on FDI for its acknowledged advantages, as evidenced in the concerted efforts of numerous African countries to enhance their business climate through reforms, resource mobilisation, and improved environment to attract long-term bilateral investment relationship globally and mainly from China (Ayanwale, 2007). China's FDI data are mostly not very precise and lacking, unlike Western countries whose FDI data are easily accessible and conforms to international organisation standards. However, the non-standardization of Chinese FDI data accounts for the zero values of Chinese FDI data for Africa from 1992-2002 (UNCTAD, 2014). Nonetheless, there is a significant increase in China's FDI to Africa regarding volume and consistency, beginning from the year 2003, due to its go global policy. It is worth noting that, the pattern of the FDI that does exist between China and Africa is skewed to the extractive industry, an indication that the discrepancy of FDI rate in Africa is due to natural resources (Anyanwu, 2012; Asiedu, 2002, 2006; Ayanwale, 2007; Drogendijk & Blomkvist, 2013; Gold et al., 2019; Morisset, 2000; Ross, 2015).

Of the 54 African countries, Algeria, Mauritius, Angola, Congo, Cameroon, Nigeria, Zambia, Sudan, Ghana, Chad, Ethiopia, Equatorial Guinea, South Africa, Libya, Tunisia, Egypt and a few others are the largest investment destination from China. This is due to the natural resource base and possibly large market size (Biggeri & Sanfilippo, 2009; Eisenman, 2012; Giovannetti & Sanfilippo, 2009; Hanson, 2008; Kolstad & Wiig, 2011; Kolstad & Wiig, 2012; UNCTAD, 2014; Zafar, 2007). Like China's bilateral trade with Africa, most of the studies on China's FDI in Africa are qualitative due to unavailability of disaggregate bilateral FDI data. The econometric study of Cheng and Ma (2010), employed UNCTAD FDI stocks and flows data from 2003-2006, but neither examined natural resources nor oil as one of the variables. Empirical studies of Drogendijk and Blomkvist (2013), Kolstad and Wiig (2011, 2012) and Qian (2012)[5] use UNCTAD inflows FDI data from 2003-2009. While these studies are undoubtedly necessary, FDI data time span used in their analyses are too short to give reliable estimates (Cheng & Ma, 2010, p.565). Secondly, mineral proxies used are only suggestive and does not capture an actual share of a country's oil/minerals exports (Gold et al., 2019). Thirdly, these studies focus on China's FDI to both developing and developed countries and not oil/minerals exporting African nations who are the primary beneficiary of Chinese FDI, which is likely to lead to bias results (Blonigen & Wang, 2004). Lastly, the political instability and corruption that are pointed as the significant institutional determinants of FDI into developing nations were not examined (Asiedu, 2006; Büthe & Milner, 2008; Sachs & Sievers, 1998). Thus, it is in the light of these shortcomings that an empirically to examine Chinese investments in African oil/minerals economies using bilateral UNCTAD FDI stocks and flows data and disaggregate imports share in order to address

[5] These studies were among the pioneer attempt carried out with China's data that are in conformity with IMF and OECD guidelines.

the issue of whether China's investment is spurred by oil and to identify how sectoral trade can influence FDI is required.

Akin to its increased dominance in trade and FDI, Chinese aid and other official economic assistance are more in favour of African resources endowed countries (Gold et al., 2017; Nissanke, 2013; Nissanke & Shimomura, 2013; Shimomura & Ohashi, 2013; Zafar, 2007). This has led to speculations mostly from Western commentators (Alden, 2005; Bing & Ceccoli, 2013; Hanson, 2008) who perceive China as a competitor in the acquisition of Africa's natural resources, and as such, query its economic conditionalities tied to aid. Whereas, China's aid is rapidly overshadowing several traditional donors, yet, it is said to encourage debt defaults and hinder good governance and reforms (Alden, 2005; Broich & Szirmai, 2014; Kragelund, 2008; Tull, 2006; Zafar, 2007), based on its divergence from the Organisation for Economic Co-operation and Development (OECD)-Development Assistance Committee's (DAC) members and multilateral agencies donors standardised pattern, channels, disbursement modalities, institutions, rules, and norms (Bräutigam, 2009, 2011b). Hence, Chinese aid to Africa is termed 'ambiguous' (Hanusch, 2012; Kobayashi, 2013, p.5; Mawdsley, 2008). Also, the volume and flow of China's aid to Africa are contested as either being overestimated or underestimated (Bräutigam, 2010, 2011b; Zafar, 2007) due to unavailability of sufficient quality data on bilateral aid.

Despite the divided opinions on the effectiveness of Chinese aid, its volume and flows in Africa, Kobayashi (2013) and Renard (2011) argue that assessing China's economic effect on Africa is premature when compared to the number of years the traditional donors have been relating with Africa. This study differs because China's aid effectiveness and aid relationship are best examined frequently, to be able to measure and evaluate its impacts on recipient countries. Nonetheless, the studies of Bräutigam (2009, 2011b),

Nissanke (2013) and Zafar (2007) argue that China's economic cooperation in Africa could be seen more in aid-funded infrastructure development projects. However, the availability of China's foreign aid data has limited most of these studies to case studies, in which in most cases, the results do not reflect the actual impacts on the entire African region. Furthermore, the empirical research of Biggeri and Sanfilippo (2009) finds that Chinese aid is not directed to poor African countries. Instead, the human capital endowment of the region is an attraction. As important as this study is, its period (1998-2005) does not conform with when Chinese economic cooperation data became acceptable by the OECD. Therefore, the estimates may not be too reliable.

Also, from a macroeconomic perspective, the available studies on Chinese aid have not successfully provided the determinants as there are no quality Chinese bilateral aid data over a long span of time to carry out such econometric analyses. Furthermore, a study of the sectoral trade that impacts aid, the explanatory and institutional variables that determine China's assistance to recipients' resources endowed African countries is lacking. Thus, this study fills the vacuum by empirically investigating the determinants of China's aid using a more acceptable bilateral Chinese loan data over a long span from 2000 to 2015. More importantly, the sectoral trade that impacts China's aid with other institutional and socioeconomic variables were examined. This kind of approach seems relevant in understanding the direction of trade and factors that determine foreign aid. Given the discussion above and arguments, this thesis hopes to provide new insights into the complementary linkages of Chinese assistance, FDI stocks and flows and trade in oil and minerals exporting African countries given the limitation in identifying the sectoral trade that determines their relationship.

1.3 Research Questions

Given the development of the above scenarios, there is need to analyse the determinants of the unidirectional linkages (trade, FDI and aid) of China's renewed engagement in the oil and minerals exporting African countries. Therefore, to solve the problem, this study seeks to address the following research questions:

1. What determines the dynamics of China's bilateral imports with African oil and minerals exporting countries?
2. What are the determinants of China's bilateral outward FDI stocks and outward FDI flows to African oil and minerals exporting countries?
3. What are the determinants of China's bilateral aid to African oil and minerals exporting recipients' countries?

1.4 Research Objectives

In sync with the above research questions, the specific objectives of the study include:

1. To examine the determinants of China's bilateral imports from African oil and minerals exporting countries.
2. To analyse the determinants of China's bilateral outward FDI stocks and outward FDI flows to African oil and minerals exporting countries.
3. To examine whether China's bilateral aid to African oil and minerals exporting recipient countries is determined by economic motive or whether altruism is the motive.

1.5 Significance of the Study

According to Biggeri and Sanfilippo (2009) and Kolstad and Wiig (2012), the major impediment when analysing Chinese engagements with Africa is data availability over a long span of time. From its foreign investment to trade and most especially foreign aid,

researchers have used few proxies as variables to represent them over a short span of time. However, there exists a considerable disagreement among researchers on the selection of appropriate quality data and proxies to measure bilateral investment, trade and aid (Bräutigam, 2011b; Cheng & Ma, 2010; Kolstad & Wiig, 2011; Kolstad & Wiig, 2012). By analysing the determinants of Chinese engagement in trade using disaggregate bilateral trade data HS 4-6-digit obtainable from UN-Comtrade; foreign investment bilateral outward stocks and outflows data obtainable from UNCTAD database; and foreign loan data obtainable from China Africa Research Initiative (CARI) database, Johns Hopkins University, this study add to the current literature on international economics. More specifically, this study differs from previous efforts by considering a long-time span from 1992 to 2015, and the comprehensiveness of these data and long duration could provide reliable and more robust estimation results which are currently lacking.

Apart from the lack of comprehensive data on China's bilateral economic engagements with resource endowed African countries, another major issue is a shortage of empirical research on the direction of sectoral trade that determines their engagement. Most of the existing studies assumed that oil, minerals and natural resources influence all the three linkages (Biggeri & Sanfilippo, 2009; Bräutigam, 2009; Zafar, 2007). Also, institutional structures, notably political instability of the host country that hinders or spur trade, FDI and aid is also required to negate or corroborate Alden (2005, 2012), Zafar (2007) and Tull (2006) arguments that China rarely relates to countries more democratic than itself. Therefore, to fill this research gap, this study undertakes detailed analyses of the economic engagement between China and African oil and minerals exporting countries, to establish a satisfactory grasp of the sector-specific trade direction of their engagement and the institutional factors, to be able to gauge the performance of political dimensions between China and oil and minerals exporting African countries.

Furthermore, the issue of foreign aid is more complicated as available studies focused more on the individual country recipient of China's aid-financed-infrastructure or oil-for-infrastructure development plan (Bräutigam, 2011b; Gold et al., 2017; Goldstein, Pinaud, Reisen, & McCormick, 2009; Kobayashi, 2013), leading to results and conclusions that are frequently generalised to many if not all countries in Africa. Therefore, to fill in the missing aspect, this research provides more empirical support for the assertions on the controversies surrounding the China-Africa aid flows by adopting the advanced econometric model, namely dynamic Pesaran fixed effects to analyse the trade-aid link and other determinants of China's aid to African oil and minerals exporting countries in a framework that reflects more economical and institutional dimensions.

Most importantly, the rationale for this research hinges on the methodological contributions to knowledge it seeks. Firstly, the augmented gravity model of trade with dynamic panel data techniques is employed to undertake trade model in research objective one. The use of well-founded multivariate econometric estimation model that is embedded in the gravity model of international trade, coupled with dynamic panel technique for estimating the determinants of trade will contribute a new perceptive to trade literature and update the methodology of bilateral trade. Secondly, generalised two-stage least squares technique is used to analyse the bilateral FDI China's stocks and flows, to address the issue of whether China's investment is spurred by oil and minerals and to identify how trade can influence FDI. The strength of the econometric estimation would enable strategy for more FDI plan that will yield numerous economic benefits from China's appended interest in the region. Thirdly, dynamic panel data technique is also used to examine bilateral foreign aid between China and African oil and minerals exporting countries. Employing a dynamic panel method for analysing foreign aid will enable the identification of long-term and short-term impacts of foreign aid on the countries under study. The identification of long-term and short-term dimension is vital

to provide implications and proffers policy strategy to oil and minerals exporting nations in making tactical decisions to improve their trade to enhance more foreign aid from China. Overall, the critical inquiry of China's economic engagement in the oil and minerals exporting African countries is based on the combined patterns of trade, FDI and aid that will reflect the related prospects and challenges of Africa's development prospect (Oyejide et al., 2009; Oyeranti, Babatunde, Ogunkola, & Bankole, 2010).

1.6 Scope of the Study

In all, there are twenty-four (24) African Union (AU) member countries producing oil and minerals. However, this study focuses on only 18 countries, namely; Nigeria, Angola, Algeria, Egypt, Libya, Chad, Gabon, Ghana, South Africa, Equatorial Guinea, Congo, Cameroon, Tunisia, Cote D'Ivoire, DRC Congo, Ethiopia, Mauritania and Zambia for the period from 1992 to 2015 (International Energy Agency, 2016). It is worth mentioning that this study excludes Sudan and South-Sudan because these two countries were regarded as Sudan until 2011 after the civil war. Hence the new countries' data begin in 2011, while old Sudan data become incomprehensible. Therefore, taking into consideration the old Sudan, Southern Sudan or the new Sudan will create the problem of missing data for a long duration. Niger Republic's oil production commenced in 2011, and there are no data of bilateral China-Niger trade before then. Zimbabwe's production capacity of crude oil is 1000barrel daily and there are several missing trade data. More so, crude oil is not its primary exports to China, but minerals. Basically, the exclusion is due to several missing trade data. In the case of Malawi, the exports to China are negligible because oil production is still in its infancy and due to lack of transparency, the sustainability has been a subject of discourse (Gamula, Hui, & Peng, 2013).

Consequently, the justification for the selection of only oil and minerals exporting countries is based on the empirical results of Blonigen and Wang (2004) which show that

pooling data from wealthy and developing countries is inappropriate. This has been theoretically proven with strong reasons to explain that FDI driving factors in developing countries differ from the factors that drive FDI to developed countries (Büthe & Milner, 2008). Thus, these countries are selected because they have similar economic conditions and endowments. Also, oil and minerals are the primary sources of their foreign exchange earnings, and it represents their major trade with China and the World. To further buttress the importance of these countries, Alabi et al. (2011), Bing and Ceccoli (2013), Bräutigam (2009), Broich and Szirmai (2014), Edwards and Jenkins (2014), Shen and Fan (2014), Taylor (2015) and Zafar (2007), stated that the majority of China's FDI and aid are concentrated in these countries. Therefore, using a cross-section of bilateral imports flows between China and African nations totalling 423 observations (1 x 18 x 24), country-specific gravity model was employed for trade model. On the other hand, for the FDI and aid models, the data will start from 2003 and 2000 respectively, due to the availability of standard and acceptable bilateral China's FDI data and China's bilateral foreign loan data to African countries under study.

1.7 Organisation of the Study

This study comprises seven chapters. Chapter 1 presents the background on the determinants of China-African oil and minerals exporting countries, bilateral trade, FDI and the foreign aid relationship. It also presents the problem statement, research questions and research objectives, significance of the study and scope of the study. Chapter 2 contains relevant theories on international trade, FDI and aid link within the review of bilateral trade. Also, the literature on Chinese engagement in trade, investment and aid is reviewed and developed, first as a general discussion, and then for oil and minerals exporting African countries. Much emphasis is placed on literature that is related to the research questions and the methodological differences used in previous studies. The general theme of chapter 3 is methodology; and it consists of the conceptual framework,

the sample size and data sources, the econometric models adopted for this study, variables description, the estimation techniques including a gravity model of trade and justifications for the econometric models adopted. Chapter 4, 5 and 6 provide analyses and discussion on the empirical results of the determinants of Chinese bilateral engagement with African oil and minerals exporting countries in the three unidirectional linkages of trade, FDI and foreign aid respectively. Chapter 7 concludes the study with policy recommendations to policymakers, limitations of the research and suggestions for future research.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

In this chapter, a brief review of the existing theories and their roles in determining the bilateral relationship between China and African oil and minerals exporting countries is carried out. Furthermore, to understand the context of China-Africa engagements, the study limits its theoretical framework to justify the analysis of bilateral trade, FDI and aid. Also, an exhaustive review of the rigorous and critical empirical literature on China's engagement in Africa is carried out to review the findings on China's role in Africa, more specifically in trade, FDI and economic cooperation.

2.2 Theoretical Framework

2.2.1 Theoretical Framework for Trade Model

2.2.1.1 Ricardo's Trade Theory

Trade with any nation is vital to enhance the economic development and welfare of its populace. This notion about trade has been documented severally as far back as when Adam Smith (1776) propounded absolute advantage of the trade. Subsequently, David Ricardo conceived the comparative advantage theory known as the classical theory of trade in the early 19th century. He advocated that each country should specialise in producing goods in which they have lower relative opportunity costs, autarky prices or, comparative cost advantages (Ricardo, 1955). The Ricardian theory of trade further assumes that "the peculiar powers bestowed by nature, distributes labour in the most effective and most economical ways" (Ricardo, 1955p.90). Also, the comparative advantage theory explains the difference in technologies as the basis for trade flows between at least two countries. Nevertheless, the comparative cost theory has been criticised based on some of its oversimplified, static and unrealistic micro welfare assumptions (Erten, 2010; Zhang, 2008) and based on its inability to adequately explain the reasons for relative advantage differences (Morgan & Katsikeas, 1997).

Nonetheless, the Ricardian theory is argued (Erten, 2010) to be superior to the absolute advantage of Adam Smith (1776) since Smith failed to put up a convincing international economic trade theory. Further, this theory explains trade gains and is particularly relevant as it influences China's investment and trade decisions in Africa. Hence, in a review of the comparative advantage theory, Deardoff (2005) used correlations between autarky prices and quantities of net exports across all goods and countries, and the result revealed that comparative advantages and gains from trade remain valid despite trade barriers, transportation and other trade impediments. Also, it is believed that if the principles of comparative advantage theory were instituted properly, minerals and energy, especially from African origins would be made available at the most efficient and economical ways without the compulsion of geopolitical competition, unnecessary conflicts and unwarranted wars.

2.2.1.2 The Heckscher-Ohlin (H-O) Theorem

The model of Eli Heckscher and Bertil Ohlin (H-O) (1919 and 1933) is sometimes referred to as the Heckscher-Ohlin-Samuelson (HOS) model (Evenett & Keller, 2002). This is because of many elaborations made on this theory by Paul Samuelson in the 1930s. Other notable contributions were made by Jones (1956) and Vanek (1968). The theory is known as the neoclassical international trade theory, built on the furtherance assumptions of the classical theory (Heckscher & Ohlin, 1991). Accordingly, the Ricardian and the H-O theorem is the basic theory of international trade that postulates the models on which premise the modern trade theories lay (Rasiah, Cheong, Cheok, & Loayza, 2019; Zhang, 2008). In contrast to the classical theory of David Ricardo, the factor proportions theory can explain the differences in comparative advantages exhibited by trading countries (Morgan & Katsikeas, 1997). Hence, the H-O theory is superior to the Ricardian theory. It predicts that scarcity of a nation's fixed endowment or the relative abundance of capital,

labour and endowed resources determines what it sells and buys to and from the other country.

One of the major underlying assumptions is that labour and capital are not available in similar proportions in both countries. That is, a nation may have a comparative advantage in the capital while another country may have a relative scarcity of labour. This assumption encourages production specialisation which increases trading countries income; a country with relatively more labour specialises in producing labour-intensive commodities exported in exchange for capital-intensive products. The relative factor abundance theorem is sufficient in predicting China-Africa relations (Herbst & Mills, 2009; Wang, 2007) because Africa is endowed with relatively more natural resources (minerals and crude oil) that are attracting aid and trade from China. Also, foreign investments act as a complementary factor to trade.

2.2.1.3 The Product Life Cycle Theory

To improve on the static comparative advantage theory of Ricardo (1891) and respond to the failure of Heckscher-Ohlin (1933) model in explaining international trade pattern, Raymond Vernon (Vernon, 1966) developed the Product Life Cycle theory. In the published model, he described internationalisation patterns of organisations in relation to how the USA firms which dominate world trade developed into multinational corporations (MNC). Vernon illustrated that a country with an absolute advantage in all products has the advantage of trading and allowing its labour force to concentrate on the products with the highest added value. Vernon (1966) rejected the classical assumption that knowledge is a free good and highlighted the importance of innovation, scale, ignorance, and uncertainty. The first phase of Vernon theory is that developed nations concentrate on producing less labour-intensive good at a higher cost. Second, as the product matures due to competition, sales growth, and internationalization, production is

extended to support other developed countries markets demands. The final phase happens when the market is mature and further cuts in production costs are impossible. At this point, research and development fall and production shifts to less developing countries which export to the original home country the finished goods (Vernon, 1992). Although Vernon's theory explains trade flows among countries of varying levels of economic development. However, it is not sufficient in explaining the trade and FDI relations between China and African oil and minerals exporting countries.

2.2.1.4 New Trade Theory

A major deviation from the traditional trade theories was made by Paul Krugman, in *'Was it All in Olin?* Which is a contribution to the literature on the new trade theory (Krugman, 1999; Sen, 2010) and it's a modification to the concept of increasing returns to scale which was mentioned in Bertil Ohlin theory but has been neglected for ages (Eisenman, 2012). Krugman's fundamental contribution was that increasing returns to scale is the reason for trade specializations among developed countries having similar technology and factor endowments and not the traditional comparative advantages (Krugman, 1999). Similarly, Sen (2010) appreciates the new trade theory and its capability to embellish scale economies, imperfect markets, and product differentiation as against the H-O theory. Conversely, Marques (2008) points out that the new trade theory aid in explaining the trade pattern between two developed countries with similar factors endowments. The new trade theory omits explicit treatment of physical capital and does not recognize the significance of physical accumulation (Zhang, 2008). Likewise, Eisenman (2012) emphasized its relevance in explaining trade pattern between two developed countries with high fixed costs, a situation more applicable to a more developed China and not applicable to Africa. Also, the new trade theory has been criticized on the bases that competition may arise due to 'first comer benefit'. Secondly, new and infant producers may be denied overture because of economies of scale and

lastly, government role becomes very important. Eisenman (2012) argues that relative factor endowments, that is, labour, capital and resources to a large extent dictates China and Africa trade relationships, either collectively or in countries specific cases. Sen (2010) argues that the traditional and the new trade doctrines both have failed to address the dynamic implications of trade opening in terms of growth and development of the trading nations; especially so for the developing countries.

2.2.1.5 Theoretical Exposition: Explaining Trade Patterns

In the unending arguments on China-Africa relations, several studies have used economic theories to explain and compare their relationship with that of the U.S.A., European Union (EU), Asia and several other global trade dominants (Dannreuther, 2010; Eisenman, 2012). The theories range from classical, neoclassical, product life cycle, new trade theory and political trade. However, Erten (2010) and Zhang (2008) note that its simplified, static and its unrealistic micro welfare assumptions of the comparative advantage do not reflect China-Africa relations. Bouare (2008) corroborates that, it is not enough in explaining international trade since it fails to determine the trade patterns and the trade gains from unilateral or bilateral trade. Furthermore, the theory is an indication that trade will not occur if endowed resources are exhausted. In support, Eisenman (2012) and Palley (2008) argues that "absolute advantage can be conferred on a nation due to technological differences". They state further that in the modern world, comparative advantages are created and not endowed.

Emmanuel's (1972) "Unequal Exchange" brought to the fore the strength of comparative advantage with the integration of commodity flow and international capital into the theory but made fundamental efforts to take over Ricardo's assumption of international immobility of factors. His aim is twofold; first to explore the effect of international capital flows on comparative advantage theory, and second, to perceive how

Ricardo's theory performs in presently. Emmanuel (1972) was able to demonstrate that international capital flows repudiate all forms of trade gains. Also, he argues that investors make high profits in developing and LDC countries when the wage rate is low. Therefore, for developing countries to gain from foreign investment, then profits made must be re-invested to bridge the gap between the haves and the have-nots and rapidly develop their economy. Situations where foreign investment and capital flows and yield much profit in the host country, are usually rare, the reason being that foreign investment and capital flow is prompted by low returns on investment and higher wage rate in investor countries. Hence, the decision to invest in developing countries where labour wages are relatively cheap and the interest rate is high. Therefore, if after investing in developing countries, foreign investors are faced with the reality of lower profits, then they are obliged to receive profits even lower than that of local investors. For these reasons, investors become more determined to take over the domestic markets, reduce prices and siphon gains made to their home countries. On this premise, Emmanuel (1972) submits that investors in developed countries take benefit of the huge difference in the labour cost of developing and underdeveloped countries and move their foreign investment and capital flows to these regions to maximise profit. Therefore, "unequal exchange" is centred on the advantage the industrially developed countries have over the developing countries that are mostly dependent on the former (Oyejide et al., 2009; Oyeranti et al., 2010).

Likewise, Zhang (2008) writes that Ricardian and the H-O theorem is the basic theories of trade and production that postulate the model on which premise the modern trade theories lay. Although, Zhang (2008) notes that in analysing trade in the 1960s, the H-O model served as the dominant framework, the H-O theory has failed to replace the specific-factor trade models and supplant the Ricardian model. Rather, the theories were refined in small scale (Zhang, 2008). To advocate like Jian-Ye (2007) and Herbst and Mills (2009), the relative factor abundance theory is sufficient in predicting China-Africa

trade patterns, since Africa has the natural resources that China needs for economic growth, and China has capital and technology that are necessary for African development.

But, H-O's three basic assumptions of (Eisenman, 2012), the constant return to scale, similar production function or technologies and no transportation costs are not relevant in China and Africa trade patterns and economic relations. In corroboration, the validity of the H-O's theorems was tested in the study of WTO (2008), which reveal a significant effect of relative factor abundance on the commodity composition of trade after relaxing some of the restrictive assumptions of similar taste and technologies. Similarly, services trade and intermediate inputs trade were partially found to be amenable to the comparative advantages and the factor proportions theories (Bouare, 2008; Deardoff, 2005). Eisenman (2012), in contrast, writes that "China's trade with Africa, at least does not appear to function as relative factor abundance theory alone might predict" (p.796). Bouare (2008) argues that H-O theory is an 'upstream' of comparative cost advantages; therefore, it is 'inadequate' as stated in Leontief's finding in determining bilateral trade. Although, Eisenman (2012) agrees that the relative factor abundance theory appears to be dominating international trade patterns, even when Paul Krugman and other economists observe the difference between the traditional trade theories and their applicability to modern trade. Furthermore, Eisenman emphasised the role of political factors with reference to Learner quotes; that some H-O's assumptions of no transportation costs or any impediments to trade, increasing returns to scale and differences in technology need modification in China-Africa trade patterns. Nevertheless, the relative factor endowments, that is, labour, capital and resources to a large extent dictate China and Africa trade relationships, either collectively or in countries specific cases (Eisenman, 2012).

2.2.2 Theoretical Framework for FDI Models

2.2.2.1 Dunning's Eclectic Analytical Framework

In 1988, Dunning put up an eclectic analytical framework as an extension of Buckley and Casson (1976) international production theory that indicates that ownership, location and internalisation advantages influence foreign investment decisions by multinationals. Before 1988, Dunning presented in 1976 *'eclectic paradigm of international production'* (p1), at a Nobel Symposium held in Stockholm on the International Allocation of Economic Activity (Dunning, 1988). According to Dunning (1988), ownership advantages are when foreign firms decide to acquire an asset to get advantages over local firms in the host country. Also, to avoid trade barriers and government policies, foreign firms sought for plump locations advantages. By internalisation advantages, foreign firms protect and control through the internalisation process. External and internal factors influence the internalisation process. External factors are market size, factors prices and resources available which dictate the transfer of resources from the investing nation to the host nation. The internal factors enhance vertical integrations of the firms' home country's attributes and the characteristics of the specific firms which distinguished them from the other firms in their own countries. The internal firm's factor is difficult to be measured, such as government policies on trade and investment incentives (Dunning, 1988). Therefore, Dunning's investment framework is categorized into efficiency-seeking, resource-seeking, market-seeking, and strategic asset-seeking (Ross, 2015). Also, Ogunkola, et al. (2008) emphasise that multinationals' investment components could be in a way of aid to promote trade and economic development which can be complementary to the host country. While this is debatable that despite the existence of technology spill-overs due to foreign investment; the existence of overseas producers may lead to competitive effect through crowding out domestic productivity and growth through competition (Alabi et al., 2011).

2.2.2.2 The Internationalization Process of the Firm Model

Johanson and Vahlne (1977) developed the internationalization process of the firm model. They highlighted small steps acquisition, integration, and foreign markets knowledge of operations as criteria for firms to build incrementally their foreign markets presence. In their model, small firms and government use exports development, and the model gives a general perception on early and sequential stages of the internationalisation process which includes location and distance. However, the theory disregard decision-makers who have the power of disrupting the internationalisation effort and assumed that the internationalisation process cannot be stopped once it begins. In addition, importing, licensing, and foreign direct investment were not considered as the starting point of any internationalisation. The model has been criticised on the bases that it focused mainly on manufacturing individual firms and overlooked the services sector. Therefore, the model cannot be used to make predictions. It provides only a partial explanation since it excluded technology, firm size, strategic considerations, economies of scale and other economic variables as factors that affect internationalisation processes.

2.2.2.3 Theoretical Exposition: Explaining Foreign Direct Investment (FDI) Patterns

The theory of factor mobility has been analysed analogously as the theory of trade by means of the notion of inter-temporal comparative advantage in trade and production. As well, trade literature demonstrated that the foundation for cross-border factor mobility is the variations in factor endowment, development in technology, the penchant of the future and present consumption among countries and propensity to consume (Oyejide et al; Todaro, 1994). Also, labour shortage often results in the mobility of labour because of the disparity in the real wage rate between and among nations. Likewise, a shortage of capital can be acquired or attracted from abundant economy abroad (Dunning, 1988; Kemp, 1964; MacDougall, 1960). Similarly, a nation that currently enjoys a comparative

advantage in consumption goods without an external loan will in the future enjoy consumption at a relatively lower price, less fluctuation of the exchange rate and higher interest rate. These stable exchange rate and high real interest rate translate into a higher return on investment. It signifies that a nation that is capable of loaning will switch capital from its present production due to volatile exchange rate and a higher rate of interest in the borrowing nation to boost the future ability to produce or consume. Thus, the major determinants of international capital and labour mobility are the interest rate, exchange rate and wage rate (Ogunkola et al., 2008). Therefore, global capital mobility, through multinational enterprises, is seen as channels for foreign capital flows or foreign investments (Dunning, 1988; Krugman & Obstfeld, 2000).

The neo-liberal theorists posit that developing countries can benefit from developed countries through the interdependence of the former to the later for development motive. This becomes possible through capital flows from wealthy nations that will help in bringing the needed transformation to the 'backward' economies of the needy nations which are characterised with high returns on capital investments. Also, the neo-classical theorists argue that with time, developing nations are expected to unite with the developed wealthier countries due to their better capacity for absorbing capital since needier nations develop faster on average than wealthier nations because of diminishing returns on capital. However, the reality on the ground shows that divergence has been the case as the amount of capital flow from the wealthier economies to the poor economies is low, leading to further gap between the have and the have-not economies (Udo & Obiora, 2006).

Furthermore, foreign investment is usually linked to sweatshop employment, reserve investment, high external dependency and income inequality (Udo & Obiora, 2006). The different opinions on the likely negative effect of foreign investment on economic growth

indicate the importance of specific enabling conditions to make sure that the positive impacts outweigh the adverse effects. Presently, the consensus seems to be that positive and meaningful relationship exists between foreign investment inflow and economic growth if the enabling environment is provided. Since economic growth is realistically related to better productivity, foreign investment inflow is capable of positively affecting economic growth. Also, new growth theorists have uncovered the major ways through which foreign investment affect economic growth (Barro & Sala-I-Martin, 1997; Borensztein, De Gregorio, & Lee, 1998; Lemi & Asefa, 2001; Markusen, 1995). A simple endogenous growth model is formulated to validate the magnitude of foreign investment in stimulating growth via technological diffusion. Normally, technological diffusion through the transfer of knowledge and espousal of good practice across borders is debatable as a vital element for prompt economic growth. It takes diverse forms; on one part, capital goods imported might represent enhanced technology. On the second part, it allows technology licensing to help developing nations to gain innovations and gives expatriates more opportunity to transfer technical know-how. Thus, it is evident from the above mechanisms that foreign investment with the package and integrate elements have the most enormous ability to transfer technical skills. Also, foreign investment encourages the adoption of modern technology in production activities during investment spill-overs. As well, foreign investment inspires skill transfers, both regarding workforce training, knowledge acquisition and through the starting alternative management practices and good organisational arrangements.

2.2.3 Theoretical Framework for Aid Model

2.2.3.1 Aid Effectiveness

The aid effectiveness literature is concerned with two distinct questions about whether aid works, and not why it should be given. The necessity of providing aid has been assaulted on the grounds of its alleged ineffectiveness in which the four strands of

arguments are established in the aid effectiveness literature. The first argument is leaning on empirical and theoretical conclusions bothering on the claim that most conditionality (aid offered in exchange for pledges of a certain change in policy) practised by donors has failed. The second stressed that aid fungibility undermined the donors' intentions as given capital is used for other ostensibly project not meant to be funded through aid. The third argument bothers on how growth regression is used to examine the determinants of aid effectiveness and measure the recipient country's policy quality. The last emerges as an extension of the third one, and it posits that aid effectiveness varies in conformity with the quality of the recipient country policy environment.

Furthermore, the broad aid objectives of development and welfare improvements have been effective, mainly in targeted programs with defined goals (Levine, 2005). However, aid is distorting fiscal sustainability, policy ownership, institutional development and autonomous long-term economic growth that donors expect to encourage aid. Analysing the effectiveness of aid has led to the consideration of the impact of aid inflows and the question of how the foreign transfer through external trade balance is affected. This becomes a genuine resource transfer issue that is somehow similar but different from the actual finance accessibility. The economic analysis consensus regarding the transfer issue is based on attaining trade deficit through higher imports and lesser exports related to an appreciation of the exchange rate. Also, 'Dutch Disease', that is, the undesirable consequence of natural resources returns on the manufacturing sector, related to the actual appreciation for the discovery of natural resources can create transfer problem (Corden, 1984; Gelb, 1988). Concerning external aid, it improves the trade of goods, reduces the price of goods and increases demand for non-tradable goods through income effects of transfer. On this basis, factors of production (land, labour and capital) are directed to non-tradable goods-producing sectors. This theoretical observation led to using literature to

analyse the empirical importance of 'Dutch disease' and the degree to which external aid is affected through a reduction in exports instead of through rising imports.

2.2.3.2 The Rationale for Aid Giving

Gunning (2005) posed the question 'why give aid'? He argues that the question is for donors to find out the rationale behind giving aid. This reasoning is logical. Because a recipient nation gets foreign aid for strategic and political considerations such as past colonial history, and to vote at the United Nations (UN) by the donors to be instead of for the needs and policies. Beyond this restrictive thinking of the possible justification for giving aid, the donors have different motives for giving aid, though few are related to economic development directly (Alesina & Dollar, 2000). Outside the political-economic rationale for giving aid, it is widely believed that the main justification for aid is the need to eradicate poverty. Evidence shows that donors often provide more concessional aid to poor countries, and certain aid plans are put in place plainly with this motive in mind. Other rationales include country population because big states are given smaller volumes of foreign aid based on per capita, despite the prevalence of poverty in these states, while smaller nations receive larger volumes of aid. Also, the donor country usually influences many countries, and this tends to result in the disproportionate volume of foreign aid being transferred to less populated countries.

Regarding bilateral foreign aid's final destinations, it is frequently intended to support partially the economic interests of identified firms or sectors in a donor's nation. Multilateral foreign aid is less susceptible to these pressures, although not completely immune from the pressure. As several donors "tied" substantial portions of given aid by means of making sure that goods and services are bought from donor's country firm(s), or aid is utilised in the donor's country for certain purposes. This practice connotes a phenomenon known as 'aid tying'. For instance, America's condition for aid requires the

purchase of food and the transportation of the food items to recipient countries is carried out by America carriers. The process is often expensive and takes longer duration when compared to purchasing the food items from any neighbouring country. By implication, recipients of 'aid tied' will receive lesser worth for every dollar of aid allotted to them than it would otherwise. Consequently, this reduces significantly the aid impact on receivers' countries.

2.2.3.3 The Linkage between Foreign Aid and Trade

According to Wagner (2003), foreign aid and trade have both direct and indirect linkages that invariably enlarge the donor country exports levels to the recipient's country. The direct linked explicitly tied aid is where an aid recipient is obligated to procure goods and services from the donor, although, exports are not proportional to the amount of assistance given. However, Wagner believes that this is done with the intention of minimising loss due to corruption or unintentionally. The indirectly linked on the other hand is when aid is not triggered by trade, but rather to maintain goodwill in expectation of future project or aid. Alesina and Dollar (2000) analyse the extent to which different self-interest or altruistic factors can explain giving patterns. In their study, they include the recipient country's per capita income, measures for colonial ties and friendship, the democratic level of the recipient's country as the explanatory variables. The findings indicate self-interest as the predominant factor behind the giving patterns, and this varies amongst donors (Wagner, 2003).

2.3 Empirical Literature

2.3.1 China's Historical and Political Cooperation in Africa

China's role in the African polity has been a hotly debated issue in contemporary development literature (Taylor, 2006), with several counter-arguments to justify the Chinese growing role in the continent. On this premise, Kaplinsky and Morris (2009),

classify phases of the historical and political dynamics of Chinese engagements with Africa in the present era into three. The first was for political motives and it happened many decades ago before the formation of the former Organisation of African Unity (OAU) and the present Africa Union (AU) when China established relations with Africa after it changed the government in 1949. Specifically, its relations with Africa began after the Bandung Indonesian conference on April 18-24, 1955 (Ofodile, 2009) of Non-Aligned Nations which was stated as solidarity for the Third World driven purposely by China's ideological rivalry with the former Soviet Union (Kaplinsky & Morris, 2009). During this era, China initiated relations and offered technical, economic, political, limited military backing to African region and liberation movement to unite with them against colonisation by the West (Renard, 2011; Vaschetto & Yin, 2011). By 25 November 1971, the Peoples' Republic of China (PRC) officially took the place of the Republic of China (Taiwan) in the UN and in the United Nations Security Council against strong opposition from the U.S.A. to recognise Beijing's 21 years clamour for global recognition as one true government of China (Egbula & Zheng, 2011). This feat was achieved with the help of countries in Asia, Latin America and Africa. Furthermore, as a member of the United Nations Security Council, China, becomes a valuable ally to African countries and grants several African countries access to intermediary voice for their concerns to be heard (Vaschetto & Yin, 2011).

The second phase of China's engagement in Africa is from the middle of the 1990s when African nations started witnessing the appended Chinese presence in economic (Kaplinsky & Morris, 2009) and political interest of the continent (Carmody & Owusu, 2007; Ofodile, 2009). This was mostly through trade and investment carried out by Chinese State-Owned Enterprises (SOE) to sustain its rapid industrialisation and economic development (Jauch, 2011). According to De Grauwe et al. (2012), as China demand for Africa's export increases, it saw the need for exporting its low-cost

manufactured products to Africa's new potential markets. In contrast, Wenping (2007), in Broich and Szirmai (2014), argues that China's presence in Africa is political and not resource seeking in the sense that China is trying to uphold 'One China Policy', and the proof is Beijing's disassociation with countries relating with Taiwan. However, to others, Beijing's interest in Africa is to acquire mineral assets, while political factor plays a role in achieving it (Davies, 2008; Kishi & Raleigh, 2015). Nonetheless, China's strategic diplomatic cooperation with Africa was intensified during this phase under the auspices of the Forum on China-Africa Cooperation (FOCAC), inaugurated in Beijing in October 2000 (Embong, 2013). At this formal inauguration, Beijing hosted its first China-Africa Ministerial Meeting, with about 80 ministers from 40 African countries and other African representatives who have diplomatic relations with China in attendance (China's Facts and Figures, 2002). Other attendees are Shi Guangsheng of the Ministry of Foreign Trade and Economic Cooperation and Chinese Foreign Minister Tang Jiaxuan (China's Facts and Figures, 2002). This Forum marked the official platform for China-Africa solidarity, economic and other cooperation, with two core documents indicating the legal and policy framework of their dialogues. Since then, the FOCAC has been held consecutively every three years, to establish a fair and just international political order in the 21st century and promote China-African relationship. Relatedly, on 10th November 2001, China's accession into the World Trade Organisation was ratified, with the belief that this will boost economic and investments globally (Malpezzi, 2001).

Subsequently, in 2003, FOCAC held its second meeting in Addis-Ababa, Ethiopia's capital with several African leaders' present, and made the successive follow up of Chinese leaders and foreign ministers to African countries annually (Zafar, 2007) to showcase itself as a political friend and an attractive economic partner, (Jauch, 2011). Thus, in the Beijing FOCAC summit of 2006, China regarded itself as the "largest developing country in the world" and Africa "encompasses the largest number of

developing countries" (Bing & Ceccoli, 2013p.120). At Beijing's Forum, China pledged to establish Special Economic Zones[6] (SEZs) across Africa (Bräutigam & Xiaoyang, 2011; Davies, 2008). Also, it defines the values and extent of China's policy in Africa with a policy statement, China's *African Policy* (Broich & Szirmai, 2014), and emphasize its stand to adhere to the principles of non-interference in internal political affairs, peaceful coexistence, mutual respect, win-win benefits and international development agenda for the African countries (Fijałkowski, 2011; State Council report, July 2014; Vaschetto & Yin, 2011).

At the FOCAC 2009 Sharm El-Sheikh-Egypt summit, China announced the cancellation of 168 African countries' debts and signed some unconditional loans and contracts in Africa that are important to China's economy (Renard, 2011; Vaschetto & Yin, 2011). At the end of the year 2009, China became one of Africa's leading trade partners, both regarding imports and exports (Edwards & Jenkins, 2014) while the United States of America (USA) and European Union (EU) remained Africa's primary export destinations (Jauch, 2011). In consonance, Renard (2011) states that even at the peak of global financial crises in 2008, the Chinese government fulfilled its FOCAC pledges and promises of economic assistance and infrastructure in Africa. Moreover, at the Beijing FOCAC 2012 summit, the African Union was officially allowed to participate in the ministerial meeting to institutionalise and consolidate their relationship with China (Alden, 2012). Thus, China's principle of no 'string attached' has also made some African leaders replace 'Washington Consensus' of the West with China's 'Beijing Consensus'

[6] Davies (2008), claim that the four SEZs in Zambia, Tanzania, Mauritius, Tanzania and Nigeria are part of the China's 'Grand Plan for Africa' to access commodities and energy assets and in return build infrastructures which the West were unable to afford for the continent. While, Bräutigam and Xiaoyang (2011), argues that the seven SEZs established in Zambia, Egypt, Nigeria (Lekki and Ogun), Mauritius, Ethiopia and Algeria (suspended) have sustainable development benefit for Africa. However, the political, economic and social consequences could hinder Africa's industrialisation plans.

(Jauch, 2011). However, China's political ideology of non-interference with internal policies of African states as against the Western ideology of control has been criticised (Alden, 2012; Hilsum, 2008; Renard, 2011). Both Alden (2005) and Tull (2006) claim that China has trouble in manoeuvring nations more democratic than itself, thus, posing a threat to quality governance. To Shen (2015), China's relation with Africa relies on agreements made at higher political levels, which is beneficial to a few elites to satisfy its aim for larger geopolitical control. Hilsum (2008) and Davies (2008) corroborate the preceding, stating that China supports elite regimes, autocratic and venal African leaders.

Furthermore, China's principle of 'less-interference' was put to the test after the December 2007 elections in Kenya and violence broke out; the analysis shows more about China than Kenya (Hilsum, 2008). Zafar (2007) went further to narrate how China benefits and prefers to trade with African countries with autocratic leaders such as Zimbabwe, Equatorial Guinea, Guinea, Sudan and Ethiopia; with evidence that the benefits go only to few political elites. Gu (2009) attests to the preceding argument in the survey of Chinese private investors in Africa by confirming that "unlike many Western investors, corruption, crime and bureaucracy did not seem to disturb particularly Chinese investors in Africa" (Gu, 2009, p. 578). According to Xu (2014), the presence of the Chinese SOE in Africa is not necessarily favourable; apart from environmental pollution, they have acted as agents for negative changes in the form of corruption, human rights violations and crimes.

Although, China has recently become more pragmatic by considering international decisions, through its efforts to control the crisis in Sudan, while also reducing its assistance to the Zimbabwean government (Ado & Su, 2014). Alden (2005, 2012), criticised China for using divide and rule tactics to gain Africa's sympathy and access to their resources. Alden (2005) added that sometimes, China sow seeds of discontent in

heterogeneous African states with different cultures and ethnic backgrounds (Eisenman, 2012). Alden (2005, 2012) foresees that over time, Beijing will face more contrary pressure and intervene in African domestic affairs either as peace broker or as done in the case of Sudan and Zimbabwe. Alden ponders further on the naivety of China in believing that it will not fall out of Africa's favour like the Westerns.

Conversely, Fijałkowski (2011) and Renard (2011) note that although Chinese engagement with Africa has mix consequences, especially in the aggressive pursuit of its economic policies, evidence shows that China serves as a new competitor for the USA and EU in Africa (Carmody & Owusu, 2007; Vaschetto & Yin, 2011). Moreover, China is toeing the Western pattern of trade and investment in the continent (Davies, 2008; Kaplinsky & Morris, 2009; Kragelund, 2009). Despite the criticism, and the Western strategic approach to under-run China's economic relations with Africa, the aim is failing (Kragelund, 2009) with China investing in areas tagged as unsustainable and risky political terrain by the traditional partners (Renard, 2011; Taylor, 2007). All these deepen China-Africa intensification with African leaders and other China's advocates embracing China as the new development partner, (Broich & Szirmai, 2014; Kragelund, 2009). Thus, Africa adheres to China as against their traditional partner's strict funding methods, such as the World Bank and International Monetary Fund (IMF) with its radical Structural Adjustment Programs (SAP) applied in the 1980s and 1990s (Jauch, 2011; Mawdsley, 2008; Renard, 2011). In support, Zafar (2007p.103) cites Sahr Johnny, the Sierra Leonean ambassador to Beijing in 2005, as saying; *"we prefer China's investment, we have a meeting, we discuss what they want to do, and they do it …, there is no benchmark or preconditions".*

This made Shinn (2007) state that "Africans are fast to criticise the West conditionality and praise the China" (p.56). In the same vein, in 2006 the President of Angola, Jose

Eduardo Dos Santos commented positively on its perfect marriage and constructive cooperation with China through 'oil-for-infrastructure' mutual benefits known as the 'Angolan model' (Bing & Ceccoli, 2013; Gold et al., 2007). However, African leaders like, Thabo Mbeki, and Jacob Zuma, the former Presidents of South Africa have a contrary opinion on China; To Mbeki, 'China cannot develop Africa; rather Africa will develop and determine her development pattern' (Zafar, 2007). Jacob Zuma warns "on the potential danger of Sino-Africa relations, which, according to him, is the replica of Western colonial exploitation and deliberate underdevelopment of the continent through exporting Africa's raw materials in exchange for imports of manufactured goods" (Bing & Ceccoli, 2013p.107). The third phase is the emergence of small and middle private sector Chinese enterprises and firms in Africa, who are mostly migrants that have worked in Chinese SOE and made a cliché for themselves through the legal or illegal source to invest in Africa, (Kaplinsky & Morris, 2009). These last two phases have not been free of criticism, (Alabi et al., 2011; Cheru & Obi, 2011; De Grauwe et al., 2012; Hanson, 2008; Moyo, 2012; Oyejide et al., 2009; Tull, 2006) with the notion that these phases are part of the economic and political strategy China has in Africa, which could be disadvantageous to Africa which lacks a strategy for China (Kaplinsky & Morris, 2009).

2.3.2 China-Africa Narratives

Sino-Africa optimistic authors view China's presence as leading to a reduction in poverty, improvements in GDP, prices of exports in the global marketplace and African economies (De Grauwe et al., 2012; Renard, 2011; Taylor, 2015). The China-Africa win-win protagonists, argues that China-Africa relations have been beneficial and mutually favourable (Aguilar & Goldstein, 2009; Ajakaiye, 2006; Ayodele & Sotola, 2014; Broich & Szirmai, 2014; De Grauwe et al., 2012; Devadason & Govindaraju, 2014; Giovannetti & Sanfilippo, 2009; Gu, 2009; Kaplinsky, 2013; Kaplinsky & Morris, 2009; Renard, 2011; Shen & Fan, 2014; Shen, 2015; Vaschetto & Yin, 2011). They explain that despite

the imbalances in terms of trade, Africa benefits from China relations in terms of the inflow of FDI, development of both social and economic infrastructures, foreign aid, granting of unconditional loans, additional revenue accrued from trade, which is a boost to Africa's economic development. Supporting the above, Oyejide et al. (2009) believe that recent Africa's growth performance is attributed to the unusual quest for African natural resources by China. Since 1992, Chinese exports to Africa grow at 18 per cent average at an annual rate, placing China as the third exporter of manufacturing in 2007 after the U.S.A. and France (Giovannetti & Sanfilippo, 2009; Taylor, 2006), and presently, the most important for several individual African countries, and the entire continent (Broich & Szirmai, 2014). Similarly, the 'Go Global' China's strategy, economies of scale, reduction in tariff, coupled with the strong comparative advantage they possess in producing light manufactured goods, have put China on an upper edge against Africa.

Conversely, others are pessimistic and question China's motives and its implications for Africa's development (Alden, 2005; Muhammad et al., 2017; Muhammad et al., 2019; Tull, 2006). Hence, they underscored China's relations with Africa as needs to secure resources to sustain its economic development (Ado & Su, 2014; Alden & Davies, 2006; Bing & Ceccoli, 2013; Pegg, 2012; Taylor, 2006, 2007). The win-lose China-Africa antagonists (Alabi et al., 2011; Cheru & Obi, 2011; Oyejide et al., 2009) give their opinions on the Ado and Su (2014) question of sustainability of the benefits of Africa cooperating with China. They answer that the relationship will only have short-run benefits, which are too risky and do not project the development agenda of the African economies. That is, in the long-run, China is likely to create the problem of 'Dutch Disease' (Zafar, 2007), due to excessive demand of oil and energy from the continent, and the resultant impact of the boom in commodity prices. In addition, Giovannetti and Sanfilippo (2009), Jauch (2011) and Zafar (2007) claim that China's role has been limited

to developing showpiece infrastructures like roads, dams, government buildings, schools, hospitals, and stadium to specific countries, where it has a long-term economic interest and have direct access to resources, without the willingness to assist Africa to industrialize. Jauch (2011) believes that China's infrastructural projects in developing African countries are discouraging the development of local industries or the expansion of industrial and competitive capacity.

Eisenman (2012) argues that on an aggregate level, resource-endowed African countries, where few elite benefits from accrue of resources exported, tend to gain regarding trade with China, while the non-resources nations on the other hand face destabilising political consequences and trade deficits. Furthermore, Eisenman (2012) notes that local producers paid heavy taxes to the government while China through the help of corrupt government agencies avoided such taxes and smuggled in their products. Edwards and Jenkins (2014), Pegg (2012) and Schott (2008) observed that the proliferation of low-cost manufacture from China into African markets may increase competition in the domestic Africa markets; leading to crowding-out of non-Chinese products flowing from other continents of the world to Africa. Alden and Davies (2006), Muhammad et al. (2017), Muhammad et al. (2018), Muhammad et al. (2019) and Pegg (2012), corroborate the position by citing the case of textile mills specifically in places where thousands of local jobs were lost in countries like Lesotho, Kenya, South Africa and Nigeria.

Due to the above scenarios, China-Africa trade relationship may have destabilizing effects on some African countries and may inhibit Africa from becoming manufacturing economies by retarding them in the era of colonialism; where they export raw materials to the traditional trading partners in exchange for imports manufactured goods (Oyejide et al., 2009). In accordance, Alabi et al. (2011), Alden and Davies (2006), Oyejide et al.

(2009), Taylor (2006) and Zafar (2007), support that China's interest is not confined to natural resources alone; it engages in light manufactures, which is beneficial to consumers but may be detrimental to African economies, with the insinuation that China's trade pattern with Africa is based on powerful market dynamics that was created partially by government policies, and they will continue to face resistance among some Africans (Eisenman, 2012).

In support of China, Bing and Ceccoli (2013) argue that the Chinese environmental and worker safety consequences are part of the initial sacrifice and colossal price to pay for any economic development model. Furthermore, Beijing is also criticised disputably for harbouring colonial tendencies towards Africa (Cheru & Obi, 2011; Jauch, 2011; Mohan, 2013), through importation of their workforce from home, poor labour practices, and lack regard for the rule of law; thus, the host economies are deprived of job creation benefits (Kolstad & Wiig, 2012; Shen, 2015). In describing China's engagement in Africa, Bergesen cited in Mohan (2013), terms it as 'surgical colonialism' and the return of 'mercantilist' (p.1263) enclave. Mohan (2013) explains Bergesen's idea of China's 'surgical colonisation' and argues that unlike the Western neo-colonisation where the West solely owns the entire African factors of production, China differs through the practice of 'national self-exploitation' and 'imperialism' because of their habit of importing cheap labour and buying off local elites. Nevertheless, the allegations that China employs prison labour in projects construction and other (Ado & Su, 2014) human right issues have not been critically answered in any literature.

Contrary to this conventional wisdom, Fijałkowski (2011) argues that certainly, China does not intend to 'colonize, subjugate, or enslave' (p.29) Africa; stating further than Beijing's help in the continent is symbolic and lack colonial legacy as against Africa's traditional partners. Fijałkowski further avers that the leading role China played in

assisting Africa during their anti-colonial struggle in the 1950s should help douse colonial and imperialist view about China (Bing & Ceccoli, 2013). Bing and Ceccoli (2013) and Fijałkowski (2011) are convinced that China and Africa have experienced military conquest in the past, and are both aiming at the same goal of development. They assert that China's political 'soft power' instrument in Africa is based on agreement, political equality and sovereignty. Also, China provides political and economic supports for SSA (Broich & Szirmai, 2014; Kaplinsky & Morris, 2009). Further, Africans independent statehood and escape from natural resources supplier is China's key to economic independence for Africa (Bing & Ceccoli, 2013; Fijałkowski, 2011). Mohan (2013) cautions political commentators who argue that 'Chinese do not integrate' and therefore are exploitative as this could mean exonerating the colonial Westerns and tagging the Chinese as 'worse' than the traditional exploiters. In support, Feng and Mu (2010) and Gu (2009) attribute 'not integrating nature' of the Chinese in Africa to cultural and communication barrier, and possibly working environment.

Renard (2011) posits that decolonisation of Africa led to disaggregation of trade, aid and FDI, which has reduced exploitation of developing economies and, integration of its markets with other new economies like the US and China. Therefore, China's presence in SSA is to resent the orthodoxy Africa historical links with the Northern and bring to the continent the frantically needed capital (Kaplinsky & Morris, 2009; Zafar, 2007). In the case of China, (Kaplinsky & Morris, 2009) FDI is tightly bundled with aid to facilitate natural resources exports. This approach of strongly built complementary relation of 'aid-trade-FDI' is 'commercial ties', (Broich & Szirmai, 2014). In their different studies, Bräutigam (2009), Moyo (2012) and Vaschetto and Yin (2011) challenge the Western stereotype view of China's relation with Africa with the notion that both China and the West mode of relations with Africa are similar. Moreover, China as a developing country with success stories about the drastic poverty reduction and glaring economic growth is

a credible and attractive partner for African countries that intend to tread related development trajectories (Vaschetto & Yin, 2011).

Indeed, these combinations of the positive and the negative benefit of China-Africa engagements have raised unanswered or partially answered questions about what the pull and push factors that determine the economic engagement of Africa to China and China to Africa? The question of the pull-factors is partially answered in Gu's (2009, p.577) survey of private enterprises in Africa as commercial opportunities while the push-factors are natural resources, market size and manpower. Therefore, it is evident from the narratives that the pull-factor/push-factor for investment in Africa is like that of the Westerns (Hanusch, 2012). Broich and Szirmai (2014) compare the similarity of both the Western and Chinese FDI in Africa. They confirm that the Western FDI is market seeking in the service sector only, but both Western and China's FDI are resource seeking in the extractive industry. Though the Chinese FDI is market seeking in the small and medium scale manufacturing industries that are labour-intensive (Chen, Dollar, & Tang, 2016). Thus, China's market seeking FDI has many textile industries locked up in South Africa, Nigeria and Ghana, where about 100,000 job losses were recorded (Alden & Davies, 2006; Muhammad et al., 2017; Renard, 2011). Gu (2009) admits that although the Chinese FDI in Africa is not efficiency-seeking but rather resource and market seeking. Indeed, it is glaring from the empirical evidence in the narratives that the nature and the direction of the impacts of Sino-Africa relations vary (Kaplinsky & Morris, 2009), from one African country to another depending on the general economic structures of the state in question.

Cheru and Obi (2011) conclude that where visionary African leadership is absent, concerted, and well-planned action is missing on the part of African leaders, then, the emerging Southern power relationship with Africa could end up to be colonialism by

invitation. Thus, Eisenman (2012) and Gu (2009) and emphasise institutional role in enacting rules and regulations to adhere to for sustainability of the relationship. However, Vaschetto and Yin (2011) caution on the issue of over-generalising the findings and conclusions of specific case studies in Sino-Africa relations as it may not be too relevant or applicable to what the fact says in other African countries.

2.3.3 Studies on China-Africa

Pioneer research efforts on China-African relations were carried out mostly in the scoping studies of the African Economic Research Consortiums (AERC) on Asian Drivers. To Ajakaiye (2006), the scoping studies commenced with eighteen (18) African countries. It was later extended to twenty-two (22) African countries with comprehensive case studies. Ajakaiye further notes that the results of most of these scoping studies have a combination of complementary and competitive consequences, which can be either direct or indirect. Although, the direct impacts as pointed out by Zafar (2007) are easy to measure, while the indirect is obscure and requires disaggregating data. The direct consequence includes China's role in locating Special Economic Zones (SEZ) in Africa to promote the structural transformation (Ajakaiye, 2006; Broich & Szirmai, 2014) that will have a sustainable impact on the continent. Other direct benefits include the creation of local employment in countries where Chinese enterprises are located mainly in countries like the Democratic Republic of Congo (DRC), Angola and Nigeria. However, these AERC studies were aimed at analyzing the impact of China-Africa relationship without any attempt at examining the determinants or the motive.

Of the few studies that examined the determinants is that of Wang (2010), he analyses the determinants of Chinese outward FDI to Africa from 2002-2007. The result reveals that the need for energy and mineral resources primarily determines China's FDI in Africa. In the study, 11 of all the African countries that are non-resources base lack

China's investment while all others have been witnessing the Chinese infrastructural development. Similarly, Edwards and Jenkins (2014) empirical study on China's crowding-out effect on South Africa's (SA) exports to sub-Saharan Africa (1997-2010) reveals that China's manufacturing exports affect SA medium and low technology products exports in the region by 20 per cent in 2010.

Hu and Van Marrewijk (2013), use gravity model of trade to examine the role of trade policies on China-Africa trade puzzle on 28 Africa countries and their partners, such as; USA, Europe, China and its other major trading partners. The study period is classified into phases; 1990-2000 and 2001-2010, in order to make a comparison. Their first results indicate that geographical variables conform to *a prior* expectation, while GDP per capita of most African countries are almost negligible when compared to that of its other trading partners. The second results which are tagged as that of the active group indicate that GDP and GDP per capita positively enhance exports. However, landlock and regional trade agreement (RTA) does not have a meaningful effect on trade. Overall, China's trade (import and export) with Africa has been underestimated and have continued to witness increase over the period under study, EU trade with Africa is declining, while US trade with Africa has been consistent. They attributed the increase in China-African trade to review policies, creating SEZ in enabling more trade with Africa and the willingness of China to trade with African countries with weak institutional structures.

Johnston, Morgan, and Wang (2015) employ the gravity model of trade to analyse how China's imports from Africa will create development prospects for Africa. The study period is from 1995-2009, and the PPML results indicate that the GDP of China is not a determinant of trade while African countries GDP is positive and significant. As expected, distance, landlocked countries, the population of the African countries,

common language conforms to *a prior* expectation. However, there is a negative effect on trade for not recognising the One China policy.

Chen et al. (2016) analyse why private Chinese enterprises invest in small and medium private firms in 49 African countries from 1998 to 2012, using firm-level data of about 2000 Chinese firms obtained from MOFCOM. These Chinese private investments are categorised into 25 sectors. Their result indicates that markets size (GDP), availability of skilled manpower, natural resource deposits therein, politically instability in the host countries with high capital-intensive sectors are the major determinants of Chinese investment. Although, Chinese investment provides the needed external capital for the region. However, the positive correlation between GDP and OFDI indicate that China's investment is market seeking (horizontal). Similarly, Chinese FDI is profit-seeking (vertical), as the results show that investments are determined by comparative advantage, they have over the host countries firms. In their other analysis of China's FDI in service sectors, the results show the market size, abundance capital, stage of development of the host country, institutional variables used and, trade costs are not determinants. While resource resources and human capital stimulate more service OFDI from China. Similarly, Ross (2015) identify and analyse the determinants of China's outward FDI in eight African countries namely; Algeria, Egypt, Ghana, Kenya, Nigeria, Sudan, South Africa and Zambia from 2003 to 2012. Findings from the results show that Chinese FDI is resource-seeking as it is determined by natural resources to sustain its economic growth; infrastructure to ease China's investment and regulatory environment the host government-enforced.

Using Tobit model (Tobin, 1958) and Heckman (1979) two-stage method, Qian (2012) examine the determinant of Chinese investment and quest for oil in Africa, Middle East, Central-Asia, Russia and Latin America. Due to the unavailability of standard FDI data,

the study period is divided into two phases, 1991-2005 (using approved China's authorities' data) and 2003-2007 (using MOFCOM OECD-IMF standardise data). The findings from both Tobit and Heckman indicate that more supply of oil and large export market enhance China's investment, therefore, its OFDI is market-seeking. On the proxies used to measure institutional quality, the results indicate that Chinese investment takes advantage of political uncertainty and corruption in the oil-producing countries. Similarly, infrastructure that is proxy as GDP per capita result shows that China's investment in oil-producing countries with poor infrastructure. However, energy output and FDI are not correlated in all the equations, rather 'go global policy' variable correlates with OFDI. Interestingly in a related study of Cheung, de Haan, Qian, and Yu (2012) on the determinants of China's FDI to Africa, the 'go global policy' make the quest for natural resources visible. Overall, China's investment in the Middle East, Africa, and other oil-producing countries are not the same.

Drogendijk and Blomkvist (2013), analyse empirically from 2003 to 2009, Chinese OFDI into 174 countries in which 47 represents Africa. They find that three variables; trade, political risk, and Chinese minorities, are significantly related to China's investments in Africa and represent the major OFDI motives. The negative correlation between political risk and investments indicate that lower political risks have a higher prospect of attracting Chinese investments. Also, Chinese firms invested more in countries with higher GDP, higher exports of natural resources and higher technological patents, thus, supporting the market-seeking, natural resource-seeking and asset-seeking theoretical motives. They conclude that the motive for Chinese FDI in Africa is not different from that of the Western firms. Correspondingly, using fixed effects technique and panel data from 22 African counties, Shan, Lin, Li, and Zeng (2018) examine the effect of natural resources, market size, institutional quality, infrastructure, trade and inflation in attracting Chinese FDI to Africa (2008-2014). The results show that natural

resources, inflation, trade, rule of law, control of corruption and lower regulatory quality do not deter FDI. Rather, market size, inadequate infrastructure, voice and accountability and political instability facilitate FDI inflow.

2.3.4 Foreign Aid

Foreign aid to developing countries in Africa is a source of capital for government and international cooperation agencies and it is complementary to both trade performance and foreign investments (Selaya & Sunesen, 2012). The standard international agencies/donors that give financial aid include the Commonwealth, the Group of 8 (G-8), Paris Club, the International Monetary Fund (IMF), the OECD, the World Bank and the Organization of the Petroleum Exporting Countries (OPEC), the United Nations Development Cooperation Forum (Bräutigam, 2010; Gold et al., 2017; Younas, 2008). These organisations classified their financial assistance into Official Development Assistance (ODA) and Other Official Flows (OOF). According to the UN, ODA is the transfer of finance and resources, which include loans, grants, and technical assistance, at a concessional rate, but military motives, finance and assistance are excluded. Also, the OECD's Development Assistance Committee's (DAC) members define OOF as preferential export credits, which is, official government bilateral transactions of loans and grants of less than 25 per cent that do not meet the ODA standards (Gold et al., 2017). The central motive for giving aid is to provide conducive economy and help to improve the welfare of the populace (Fielding & Gibson, 2013; Selaya & Sunesen, 2012). However, some conventional literature on aid argues that political and strategic interests supersede economic and welfare reasons, especially for multilateral donors. As well, colonial ties and the need to support recipient country institutions are other factors for giving aid (Alesina & Dollar, 2000; Neumayer, 2003). This argument about giving aid motive brought to the forefront "moral standard" issue about the economic and institutional conditions tied to aid by traditional donors, particularly in the 1980s and

1990s during the period of Structural Adjustment Programs (SAP) put in place by the World Bank due to the chronic debt crisis in Africa. Subsequently, by the late 1990s, the world began to witness the emergence of Asian economies (China and India in particular) shaping the new global economic order (Nayyar, 2010, 2016) and exerting huge influence through South-South development cooperation[7]. Among the Asian economies, China's economic interactions and influence are more pronounced in aid-giving, infrastructure (Bräutigam, 2009; Gold et al., 2017), exports of low-cost manufactured goods at the detriment of African countries' industries (Lubieniecka, 2014; Muhammad et al., 2018; Muhammad, Mukhtar, & Gold, 2017; Schott, 2008) while its need for natural resources are viewed to have caused commodity booms and economic growth as the resource-endowed countries become global investment targets[8] (Kaplinsky, 2009). The above scenario about Chinese dealings in Africa is in consonance with the economics of aid objective of securing trade benefits through goodwill.

Despite the mixed reaction on Chinese motive for giving aid to Africans, China's aid and other official economic assistance to Africa is rapidly overshadowing several traditional donors, due to its loan policy of less conditionality. The less conditionality policy to critics encourages debt defaults and hinders good governance and reforms (Alden, 2005; Broich & Szirmai, 2014; Dreher, Fuchs, Parks, Strange & Tierney, 2018; Kragelund, 2008; Tull, 2006; Zafar, 2007). Furthermore, Chinese assistance and other engagements with Africa is regarded as "ambiguous" (Hanusch, 2012; Kobayashi, 2013,

[7] To promote South-South trade and collaboration within its agencies, the United Nations in 1978 established South-South cooperation, but its influence on development began in the late 1990s.

[8] There is a consensus that natural resources, lucrative market, labour cost, fiscal and other non-tax incentives, exchange rate, interest rate and liberalization policies determine China's influx to Africa (Dreher et al., 2018; Nissanke, 2013; Ofodile, 2009).

p.5; Mawdsley, 2008), because of its divergence from the traditional bilateral and multilateral agencies' and donors'standardised pattern, channels, disbursement modalities, institutions, rules, and norms (Bräutigam, 2009, 2011b). Thus, China's approach is classified as changing forever the landscape in an aid-donor relationship involving resource-endowed and aid-recipient countries in Africa (Gold et al., 2017; Nissanke, 2013; Nissanke & Shimomura, 2013; Shimomura & Ohashi, 2013; Zafar, 2007).

2.3.4.1 Chinese Development Assistance and Aid in Africa

The African continent is the largest recipient of China's external development aid, which has been influenced by economic reasons, strategic diplomacy, domestic politics, ideologies and values (Kobayashi, 2013). An "emerging donor" as the People's Republic of China (PRC) is often called (Bräutigam, 2010, p.3) began its international development assistance shortly after its 1949 change in government. Indeed, the foundation of China's foreign policy was formulated on the "Eight Principles of Economic Aid and Technical Assistance", as laid down in 1964 by the Chinese Prime Minister Zhou Enlai (Strange et al., 2013), which are: Equality and shared benefit; Respect for sovereignty, non-interference in internal affairs of African state and territorial integrity; Giving low-interest and free loan with flexible repayment plan; The Chinese government helps increase the recipient country's income and accumulate capital by completing projects with less capital, but produce quicker outputs; Making sure the recipient countries are self-reliant to develop their respective economies; Providing best equipment and other Chinese manufacturing goods at affordable market prices; Technical assistance; The Chinese experts dispatched to assist with construction will be treated the same way as recipient countries experts. More than 50 years later, the eight principles remain the features of engagement influencing Chinese official stance.

China's first development assistance to Africa was to Egypt in 1956, extended to Guinea in 1960 and this continued until African countries gained independence. Furthermore, financial aid was given to support socialist leaders in Mali and Ghana. The scope was further extended to all African countries having diplomatic relations with Beijing instead of Taipei. By the mid-1970s, other major infrastructure projects, including the Tanzania-Zambia Railway (TAZARA) was funded (Bräutigam, 2009; Strange et al., 2013; Xinhua, 2011), although, due to its reform in the 1970s and 1980s, China's aid to African continent dwindled (Bräutigam, 2010). Nonetheless, during a visit to Africa in December 1982, Chinese Premier Zhao Ziyang declared the "South-South cooperation" and included "diversity in the form" to its foreign aid principles. This marked a significant reform on its existing principles because it was meant to change foreign aid from one-way loans to economic cooperation for the benefit of all partners. It was during this period, precisely in 1984 that announcement of its aid obligations to Africa acceded some OECD Development Assistance Committee's members like Sweden, the United Kingdom, Japan and Norway (Kobayashi, 2013).

Furthermore, official financial support of China to Africa separates business development projects from social services with the former attracting trade credit and commercial loans, and in most cases, repayment is linked to the output of the projects while the latter attract grants and quasi-grants (Ogunkola, Adewuyi, Oyeranti, & Bankole, 2008). Other characteristics of Chinese official assistance which helps in developing more financial inflows to Africa includes merging commercial projects with debt financing, taking advantage of aid to influence funding from sources that are non-governmental and developing productive sectors and concentrating on capital expenditure (Ogunkola et al., 2008). Chinese loans are known to proffer 3.6 per cent as the interest rate for a period of four (4) years and mature in twelve (12) years. In precise terms, this grant element

represents about 36 per cent, thus it meets DAC's[9] criteria of concessional loans (Bräutigam, 2010, 2011b).

Hence, like its other relations with Africa, China's aid has continued to be more equivocal and highly criticised based on its divergence from the traditional "official development assistance patterns and norms[10] (Bräutigam, 2009). Although Chinese development assistance to Africa is relatively small (Alden, 2005), its development programs centred on infrastructure construction, production, technical assistance and training, rather than the OECD implemented programs and social projects (Condon, 2012). Another initiative implemented, which falls outside the PRC's aid policy is the provision of "humanitarian aid[11]" in Africa. Unlike the highly publicised Western aid, China's aid figures were kept as a state secret and not officially published until recently (Bräutigam, 2011b; Strange et al., 2013). This is due to the possible criticism and objections from "a substantial part of the Chinese population who might have strong objections to Beijing's decision to give aid funding to other developing nations" (Broich & Szirmai, 2014, p. 18), particularly, from the West and mountain parts of China where poverty and income inequality are still evident. Therefore, China views its aids data publicity as "improper or even immoral" (Bräutigam, 2009, p. 166) as it amounts to priding oneself on delivering development assistance to other developing countries.

[9] According to DAC, ODA comprises concessional funding meant for countries with income per capita of $11,455 below. The ODA has grant element at 25 per cent rate. Also, OOF includes government finances that does not fulfil ODA condition. See Bräutigam (2010, 2011b) for detail review.

[10] Bräutigam (2009, 2011b) gives the details and distinct characteristics and definition of the Chinese government 'aid' and official development assistance. Also, Kishi and Raleigh (2015), Kobayashi (2013) and Strange et al. (2013) analyses the motive behind Chinese aid to Africa.

[11] "Humanitarian aid" is differently administered by the Ministry of Social Welfare – is a stopgap measure that is usually administer when there is catastrophe or extreme situation of needs, determined by circumstance and requirement.

Against this backdrop, the Chinese Ministry of Commerce (MOFCOM) established the Export-Import Bank of China's (Ex-Im-Bank[12]), to provide concessional (fixed-rate, low-interest) loans, semi-commercial grants and zero-interest loans to developing countries. China's Exim-Bank mixes development, diplomacy and business objectives with overseas finance. Thus, at the wake of the new millennium which coincides with its emergence as economic superpower, coupled with the realities of globalisation, saw China under the leadership of Jiang Zemin introduced the 'go global policy' and the recently BRI as its new national strategy to sustain its economic development and with external assistance embedded as one of the elements in achieving this aim. Ever since, African countries that maintain diplomatic relations with China get instant funding aid irrespective of their institutional contexts (Bräutigam, 2010; Kobayashi, 2013). Moreover, the "strategic partnership" launched in the FOCAC 2000 summit increased China's assistance to Africa. China's Ex-Im-Bank has remained an essential vehicle for delivering the FOCAC summit's pledges and ease the administration of foreign aid (Ofodile, 2009).

According to the State Council Official White paper reports (Xinhua, 2011), China made Eight-Point Plan pledged during the November 2006 FOCAC Beijing Summit which are; i. to double China's aid assistance provided to Africa by 2009; ii. to offer $3billion preferential loans and $2billion of preferred export buyer's credit to Africa by 2009; iii. to inaugurate the China-Africa development fund to reach the total amount of $5billion and assist Chinese investors in Africa; iv. to help build the African Union Convention Centre; v. to cancel all government interest-free loans given to Africa indebted countries that maintain diplomatic relations with China but failed to pay back as

[12] The Exim-Bank was founded in 1994 with China Agricultural Development Bank and China Development Bank and is currently the world third largest credit agency (Bräutigam, 2010).

at the end of 2005; vi. to establish China market in Africa and expanding tariff coverage from 190 tariff lines to over 440 on commodities for less developing African countries having diplomatic relations with China; vii. to create five special overseas trade and SEZ[13]; viii. to intensify collaboration in agriculture, human resource development, medical care, social development and education. This will be achieved through training of 15,000 professionals, 100 senior agro-technology experts and the dispatch of 300 youth volunteers to countries in Africa. Furthermore, there was a plan for setting up of 10 agro-technology demonstration centres with special features; 100 rural schools; and increase African student scholarships from the current 2,000 annually to 4,000 annually by the end of 2008. Also, building 30 hospitals; 30 centres for prevention and treatment of malaria, with over 30million Chinese Yuan grant anti-malaria drugs, was another step towards achieving the goal.

Furthermore, at the September 2008 United Nations High-Level Meeting on the Millennium Development Goals, China pledged to help train solely for 1,500 teachers (principals included) from African countries; train 1,000 doctors, nurses, managers; staff and equip the 30 hospitals it built for African countries. In its usual characteristics, New Eight-Point Plan for China-Africa cooperation was launched during the November 2009 fourth FOCAC Ministerial Conference; they are;

- provision of 100 clean energy projects in the fields of biogas, solar energy and small hydropower stations in tackling climate change, urban environmental protection, new energy development, prevention and control of desertification issues;

[13] The proposed zones are to be established in Zambia, Mauritius, Egypt, Nigeria and Tanzania (Ogunkola et al., 2008).

- inauguration of the China-Africa partnership in science and technology with 100 joint research, demonstration projects to be carried out by 100 post-doctoral students invited to China with the aim of giving them subsidies on their return to home countries;

- to provide $10billion concessional loan, $1billion for small and medium enterprises (SMEs) and cancel all debt of interest-free government loans matured in 2009 for HIPCs and LDCs having diplomatic relations with China;
- to offer an initial 60 per cent zero-tariff to export commodities from LDCs in 2010, which gradually increased to 95 per cent to ally countries;
- to deploy 50 agro-technology teams to train 2,000 agro-technicians and increase to 20 the number of built agro-technology demonstration centres in Africa;
- to deliver medical equipment and malaria-fighting materials worth 500million yuan and train 3,000 doctors and nurses in total;
- to strengthen the development of human resources; 50 schools were built with more training for professionals and 5,500 African students were to be given scholarships by 2012; and
- China-Africa Joint Research and Exchange Plan for scholars and think tanks for better policymaking.

At the end of 2010, China's Exim-Bank loaned Africa about $67.2billion for development projects (Bing & Ceccoli, 2013), as compared to $54.7billion from the World Bank. Thus, 325 infrastructure projects were financed of which 142 had been completed (Kobayashi, 2013) in LDCs, and the resource-endowed, non-HIPCs such as Angola, DRC, Nigeria and Sudan (Goldstein et al., 2009). Also, China's Department of Aid under its Ministry of Commerce financed over 900 foreign aid projects in Africa (Bräutigam, 2010). Also, the assistance of $20billion was given in 2012 under the

FOCAC summit (Kobayashi, 2013), with preference given to agricultural, medical and infrastructural development. Within this period, over 86 infrastructural, economic projects were completed, amongst which is the landmark Tanzania-Zambia Railway (Xinhua, 2014).

2.3.4.2 Other Studies on Development Assistance and Aid in Africa

Most of the existing studies on China's official aid to Africa have been generally descriptive in nature due to the non-availability of standard bilateral aid data that are acceptable by OECD. Therefore, the review of literature on other studies of aid or economic cooperation to Africa becomes necessary to help identify the relevant variables to be examined using econometric techniques. Younas and Bandyopadhyay (2007) examine whether aid donors (multilateral and bilateral) care about declining trade revenue from liberalisation using pooled ordinary least squares (POLS) econometric technique and obtain data from international development statistics, WDI and IMF for 52 low-income and middle-income aid recipient countries from 1992-2003. They include in their model income per capita, infant mortality, population, level of political rights and civil liberties to recipient country GDP, trade openness, geographical distance, the colonial experience of the recipient, import duties and tax revenue of the recipient country. The econometric results show that per capita income and infant mortality are indicators of aid allocation. Other variables that determine aid allocation for bilateral donors are political rights, trade openness, colony, distance, tax revenue. For multilateral aid, there is less magnitude on infant mortality, while trade openness and tax revenue are insignificant. Overall, their study indicates that economic efficiency is visible through trade liberalisation, but liberalisation leads to fiscal instability in low-income countries, therefore, the determinants of multilateral and bilateral aid are quite dissimilar.

Younas (2008) investigate whether altruism or trade benefits is the determinant for aid allocation among 22 DAC member countries of OECD to 80 recipients of aid countries from 1991-2003. The study employs a POLS estimation technique and obtains data from international development statistics, WDI and UNCTAD databases. In the econometric results, a diminishing marginal impact of aid is visible for countries with a higher population, that is, the higher the recipient's population, the lower the impact of aid on such country. As well, per capita income and infant mortality are indicators of well-being; and the human right variable that is proxy as political and human right, common colony, total import and ratio of manufacturing goods to total imports have the expected sign as determinants of aid allocation. However, the total export result indicates a bias to aid allocation and agriculture goods; so total imports have no significant impact on aid allocation. Therefore, exports of the donor country, institutional quality and alleviating physical miseries are all crucial determinants of bilateral aid.

Fielding and Gibson (2013) analysed aid inflows and Dutch disease in 26 Sub-Saharan African countries using OLS and vector autoregression (VAR) with data spanning from 1970 to 2009. They identified GDP, real exchange rate and inflation as the three dependent variables that determine aid inflows including GDP per capita, trade openness and institutional quality (regulatory quality or government effectiveness). The results show that countries with pegged hard exchange rate experience real exchange rate appreciation once aid increases and it leads to positive responses on their GDP when compared to countries with the flexible exchange rate. The change in GDP of countries with flexible exchange does have a negative correlation with the degree of aid appreciation, which tells an indirect indication of Dutch disease. Also, institutional quality shows that better regulatory quality or government effectiveness helps efficiency and mitigates exchange rate appreciation when aid increase. However, trade openness and

GDP per capita do not have any significant impact on aid inflows to both pegged exchange rate countries and those operating flexible exchange rate.

2.3.5 China - Africa Minerals Resources

The year 1993 marked the emergence of China as a major importer of crude oil (Downs, 2007; Hanson, 2008). Before this period, China depends mainly on Coal as the main energy source (Hanson, 2008). However, in the last two decades, China became the world's second-biggest importer of oil, after the United States and above Japan and India (Alden, 2005; Anyu & Ifedi, 2008; Carmody & Owusu, 2007; Hanson, 2008; Obi, 2008; Taylor, 2015), as against its former position as the second-largest exporter of oil in Asia. Thus, in 2009 it became a net importer of crude oil and petroleum products (Quigley, 2014). Consequently, it is estimated that by 2030, China's demand for oil will increase to 16.6 million barrels daily and imports will rise to 12.6million barrels per day, indicating that 75 per cent of its consumption will be imported (Downs, 2007). This demand will amount to the entire oil production in Africa and twice the output of Saudi Arabia (Kelley, 2012).

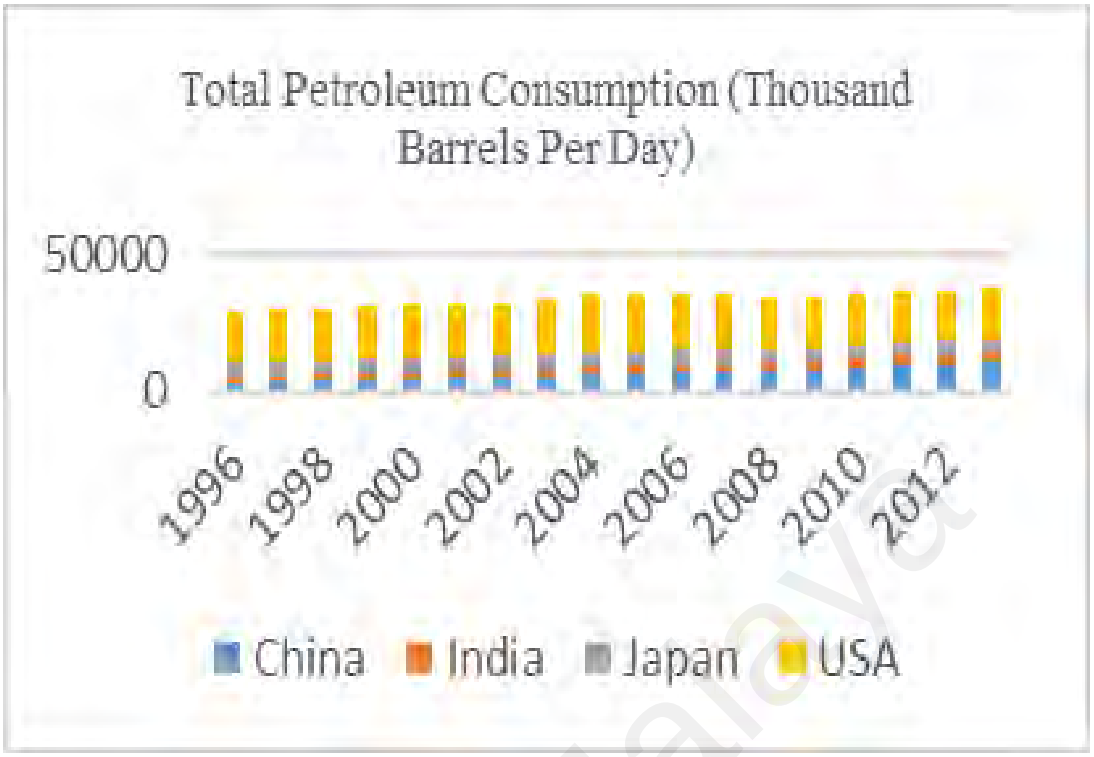

Figure 2.1: Global Major Petroleum Consumption (thousand barrels per day)

Source: International Energy Agency (2016).

According to the International Energy Agency (2016), China's oil consumption in 1996 was 4.2 million but rose to 7.9 million barrels per day in 2012. Its demand on the average stood at 6.2 million barrels per day in 2014 while its oil consumption amounted to about 43 per cent of World oil consumption growth. China's increasing need for oil and natural resources is fuelled by its dynamic economic growth (Carmody & Owusu, 2007; Quigley, 2014), domestic and 'meteoric' rise in the number of private automobiles (projected to be 100 million in 2015, which will surpass that of the United States by 2030) plying its roads (Anyu & Ifedi, 2008; Hurst, 2006; Kelley, 2012, p. 38). Chinese oil MNCs have been investing in oil production around the world, particularly in Sub-Saharan Africa, partly for security reason[14], to sustain its growth, and also to diversify its

[14] Downs (2007), China's energy demand is beyond the present consumption, but rather sceptical for future energy security, preparing for a day it will find itself in a situation when money is available but no oil in the international market because of war or other political turmoil.

sources of energy away from the Middle East (Alden & Davies, 2006; Carmody & Owusu, 2007; Dannreuther, 2010; Egbula & Zheng, 2011; Obi, 2008; Pegg, 2012). At present, 30 per cent of China's energy is derived from Africa (Egbula & Zheng, 2011; Kelley, 2012; Obi, 2008). This figure translates to the fact that China's import from Africa is 70 per cent crude oil base, while 15 per cent is on other mineral resources like bauxite, copper, aluminium, uranium, iron ore and manganese among others (Kelley, 2012; Kolstad & Wiig, 2011; Taylor, 2006). Also, Beijing's interest in copper increases the price from $1319 per tonne in 2001 to $8800 in 2006 (Carmody & Owusu, 2007). China's significant imports and the biggest share of China's FDI in Africa is more in the extractive industries (Alabi et al., 2011; Anyu & Ifedi, 2008; Biggeri & Sanfilippo, 2009; Carmody & Owusu, 2007; Hanson, 2008; Kolstad & Wiig, 2011; Pegg, 2012). In 2013, Nigeria, Angola, Libya, Egypt and Algeria produced 75 per cent of Africa's crude oil (International Energy Agency, 2016). Against this backdrop, China's exports and investment in crude oil and minerals from resource-endowed countries in Africa to secure energy increased (Alabi et al., 2011; Alden & Davies, 2006; Anyu & Ifedi, 2008).

2.4 Methodological Differences

In recent times, researchers have turned to the gravity theory of trade to fill the vacuum between the new trade theory and the conventional trade theories in analysing the China-Africa relations. The proponents of this model believe that it works well empirically, and it is very robust (Rose, 2000), yielding reasonable parameter estimates, including political, technological and economic drivers (Eisenman, 2012). It is flexible and accommodates core trade variables; income and distance in the equation justify trade theories, imperfect competition and H–O model (Yamarik & Ghosh, 2005). However, GM is also lacking a theoretical foundation and has been criticised based on this. Nevertheless, several investigations on the theoretical underpinnings of the GM are on the increase. There seems to be reviving of the theoretical and empirical credibility of the

international trade model (Olofin, Salisu, Ademuyiwa, & Owuru, 2014). Moreover, recent developments in the modelling of bilateral and multilateral trade provide GM with better satisfactory theoretical underpinnings in the theory of trade, which is considered important in the study of China-Africa. Lately, empirical researchers centring specifically on what determines trade, FDI and aid are on the increase. Earlier efforts were pioneered by Linnemann (1966), Pöyhönen (1963) and Tinbergen (1962), where the use of the Gravity model was first proposed. Subsequent studies were carried out after these pioneering researches to examine the workability of the GM, particularly in modern decades. Kepaptsoglou, Karlaftis, and Tsamboulas (2010) analyse Mediterranean countries' and European Union exports and imports from 1993 to 2007. By employing panel data and structural uncorrelated regression method with two ways fixed and random effects, they find that the basic traditional GM variables, perform well, thus satisfying the direct and indirect theoretical expectation of the relationship between trade and distance and income respectively. Having stated some studies that employ GM to analyse both China-Africa economic relations studies and other trade-related studies, it is imperative to put in clearer perspective other studies on trade and FDI that employ different methodologies to analyse their renewed relations, hence, China-Africa trade is in Table 2.1 and FDI in Table 2.2.

Table 2.1: China-Africa Trade Relations Studies with Different Methodologies

1.	Oyejide et al. (2009)	"China-Africa trade relations: insights from AERC scoping studies."	World Bank, World Development Indicator 1990-2007, and ITC 2003-2007 data.	Qualitative	The negative effects of China's trade relations with Africa overshadow the positive effects. In the sense that the existing trade pattern is reinforced by China's increasing profile that is not in line with the long-term industrial objectives of Africa. Although there are trade-related gains regarding lower import prices, and availability of varieties of goods mainly to the consumers, as well as the need for Africa's exports resulting in the price increase. On the other hand, China poses a threat to Africa's manufacturing sector as a result of its competition with local and external markets.
2.	De Grauwe et al. (2012)	"African trade dynamics is China a different trading partner?"	53 African countries (1996-2009); SITC data on export, import from IMF-Dot, WB.	Quantitative: GM to identify the impact of good quality governance in Africa on her trading partners like China, UK, France, Germany, and the USA	Among the five (5) African trading partners, China is the only country where the negative and significant relationship is found between African exports and the quality of governance variable. This indicates that China is the only country that export and import to Africa countries with bad governance and plays a significant role in their development. Although all other four exports to Africa irrespective of the quality of governance, but imports not from an African country with bad leadership.
3.	Besada, Wang, and Whalley (2008)	"China's Growing Economic Activity in Africa"	IMF; OECD; AFDB's African Economic Outlook report; UNCTAD Asian FDI in Africa 2007	Qualitative	China needs a secured supply of resources from Africa, other factors that determine their interest in Africa are political, the quest to fill the void left by the OECD in Africa by bringing growth and development to the poor developing Africa states, China is poised to be the primary source of development finance in Africa as against the OECD. Also, China's presence has impacted positively and significantly, especially in alleviating poverty and improving people's standard of living.

'Table 2.1 continued'

S/no	Author	Title	Data	Method	Main findings
4.	Devadason and Govindaraju (2014)	"China-Africa Trade and Investment Relations: Whither South-South Cooperation?"	1992 to 2012 SITC data of selected 43 Africa, 11 the Middle East, 15 Asia and 20 Latin America (LA) regions.	Quantitative: Poisson Pseudo Maximum Likelihood (PPM) and Gravity Model (GM)	Natural resources and market dynamics determine Sino-Africa trade relations, and the same pattern goes for LA and ME. Except for FDI variable which is positively significant for China-Asia only.
5.	Hanusch (2012)	"African perspectives on China-Africa: modelling popular perceptions and their economic and political determinants."		Multi-level modelling techniques	The respondents believe that Chinese investment in Africa may reduce poverty.
6.	Zafar (2007)	"The Growing relationship between China and Sub-Saharan Africa: Macroeconomic, trade, investment, and aid links."		Qualitative: a narrative case study of oil sector & low-textile industry.	Dutch disease may arise because of China's excessive demand for Africa's mineral resources. Also, China exports of low-cost manufactured textiles to the African market is displacing local producers, increase unemployment and poses a treat to industrialization.
7.	Besada, Wang, and Whalley (2008)	"China's Growing Economic Activity in Africa"	IMF; OECD; AFDB's African Economic Outlook report; UNCTAD Asian FDI in Africa 2007	Qualitative	China needs a secured supply of resources from Africa, other factors that determine their interest in Africa are political, the quest to fill the void left by the OECD in Africa by bringing growth and development to the poor developing Africa states, China is poised to be the primary source of development finance in Africa as against the OECD. Also, China's presence has impacted positively and significantly, especially in alleviating poverty and improving people's standard of living.

Table 2.2: China-Africa FDI Studies with Different Methodologies

S/no	Author	Title	Data	Method	Main findings
1.	Weisbrod and Whalley (2011)	"The contribution of Chinese FDI to Africa's Pre Crisis Growth surge."	13 Sub-Saharan African countries (2003-2009) namely; Angola, Botswana, DRC, Ghana, Madagascar, Nigeria, Sudan, Zambia, Ethiopia, Kenya, Niger, South Africa and Tanzania	Quantitative: Solow growth accounting model	About 78% of Chinese inward investment is in core countries like Nigeria, Niger, DRC and Zambia; Chinese FDI increased during the pre-global crisis 2005-2007; as well as during the crisis period of 2008-2009 more than the entire 2003-2009 period. Although the impact of Chinese FDI on GDP of the selected countries varies between individual countries, years and key resources sectors; Overall Chinese FDI had some significant notable effect on GDP growth. Other countries like Tanzania, Ethiopia, Ghana and Kenya, on the other hand, witnessed a considerable increase in their respective GDP because of Chinese FDI in a post-crisis period of 2008-2009. It was observed that Chinese FDI increased GDP by 0.04% to 1 % on the average in all the countries except for Zambia which witnessed about 1.9% growth. By and large, there is the potential possibility of increased Chinese FDI in the entire continent in future due to more demand for resources. Apart from South Africa, Nigeria is the second biggest economy in sub-Saharan Africa with China's FDI of $916 million from 2003 to 2009. This result indicates some positive effect is accounting for 0.46%, 0.13 % and 0.11% of annual GDP in 2007, 2008 and 2009 respectively.
2.	Kolstad and Wiig (2012)	"Better the devil you know? Chinese Foreign Direct Investment in Africa"	2003-2006 UNCTAD data of Chinese outward FDI for 29 African countries	Econometric approach OLS	The result shows that natural resources have a positive and significant relationship with FDI for low institutional development values. That is, natural resources and weak institutions attract China's FDI to Africa.

'Table 2.2 continued'

3.	Bing and Ceccoli (2013)	"Contending Narratives in China's African Development"	A narrative case study of Angola and Nigeria	Qualitative	Through a formal institutional mechanism known as oil-for-infrastructure, China provides needed infrastructure development and financial assistance to Angola and Nigeria, which are the two leading oil exporters in sub-Saharan Africa. Though, the successful implementation of China's economic 'development model' in two case study quite varied. The difference comes from the leadership of the countries under study. In the case of Angola, the formal agreement termed as the 'Angolan Model' records success because of the ideological commitment on the part of their government. Unlike Angola, Nigeria recorded less success due to inconsistency in political ideology, even though it lacks the needed infrastructures.
4.	Kolstad and Wiig (2012)	"What determines Chinese outward FDI?"	2003-2006 UNCTAD data of Chinese FDI flow in 104 countries. Of both OECD (25) and Non-OECD (79).	Quantitative: OLS	Chinese FDI in Africa has the image of "ravenous dragon" and is different from that of developed countries FDI in Africa, unlike in the OECD countries FDI, which is mainly determined by markets. This shows that the determinant of China's FDI for the two categories of the host economies differs. Chinese FDI flow to host countries is not only attracted by large markets but is also determined by abundant natural resources and weak institutions, emphasising petroleum as the primary interest of Chinese FDI.
5.	Alabi et al. (2011)	"An analysis of China-Nigeria investment relations."	1997-2007, 3-digit SITC	Mixed: Quantitative; ratio, percentages, correlation and cross-tabulations. Qualitative: Surveys, case studies and interview of key informants.	China's foreign direct investment in Nigeria is concerted only in sectors strategic to China's interest, e.g. like the extractive industry.

2.5 Summary

In this chapter, theoretical and empirical literature review on China's rapidly growing economic relations with African oil/minerals exporting countries vis-à-vis trade, FDI, aid was carried out. A conscious effort was made to indiscriminately inculcate many important kinds of literature on Sino-Africa studies. Its emphasised China's increasing engagement with Africa to get an understanding of their renewed relationship and build the basis of their economic engagement. The purpose was to identify the areas that were overlooked or not addressed by previous scholars and to assist in the selection of appropriate econometric techniques and variables to be included in the models. Based on the literature, there is at best-mixed evidence and findings on the impacts of Chinese engagement with Africa in the literature. It is also evident from the review that due to data limitations, most of the studies are based on qualitative and limited case studies, while the few econometric analysis results lack rigours to buttress many of the opinions on Sino-Africa relations. Thus, this has led to results and conclusions that are frequently generalised.

Furthermore, this review of the empirical literature brings to the fore three important implications for examining the determinants of Chinese engagement in African oil and mineral exporting countries. First, it must be considered within a specific trade sector to bear any meaningful result on the determinants. Second, analysis of Chinese engagement should take on regions having similar economic conditions and endowment to delineate the benefits and costs of this engagement to development. Lastly, the role of institutional quality as one of the major determinants of China-Africa economic engagement remains an issue that requires further investigation.

CHAPTER 3: METHODOLOGY

3.1 Introduction

This chapter discusses the conceptual framework of the study, sampled countries, sources of data and data description, model specification, estimation techniques, justification and explanation of the selected variables used in the study.

3.2 Conceptual Framework

This trade part of study builds majorly on the comparative advantage and Heckscher-Ohlin (H-O) factor endowment theories, whereby; endowed resources, labour and technology determines the trade relationship between China and Africa (Eisenman 2012). Based on these theories, existing empirical studies on trade have identified other economic, socio-economic, geographical and institutional factors that either enhance or reduce trade between bilateral and multilateral trading partners. In the existing bilateral relationship between China and African oil-exporting countries, FDI is identified as a major economic factor that is based on the theories of internalization investment and trade patterns of organisations (Vernon, 1966). The FDI decisions are mostly linked to trade, institutional structures of the host countries, the level of human capital development available in the host countries, market size, infrastructure, macroeconomic policy and efforts put into ensuring its stability by the host countries government (Gold et al., 2019; Johanson & Vahlne, 1977). All these approaches are regarded as location, ownership and internalization advantage (Dunning, 1988). China's approach is not only trade and FDI linkages but also linked to infrastructure development; such as; building railroads, hospitals, dams, power plants, telecoms, government buildings among others; granting of loans and giving aid (termed as 'economic cooperation'). This China's pattern of engagement in Africa is relevant considering that FDI is capital source outside to help in stimulating economic growth (Gold et al., 2019), and it is equivalent of foreign aid invested in the form of physical capital (Selaya & Sunesen, 2012). Therefore, these three

channels of trade, FDI and foreign aid are linked based on these theories, and it is used to formulate the conceptual framework depicts in Figure 3.1 on the determinants of economic engagement between China and oil and minerals exporting African countries.

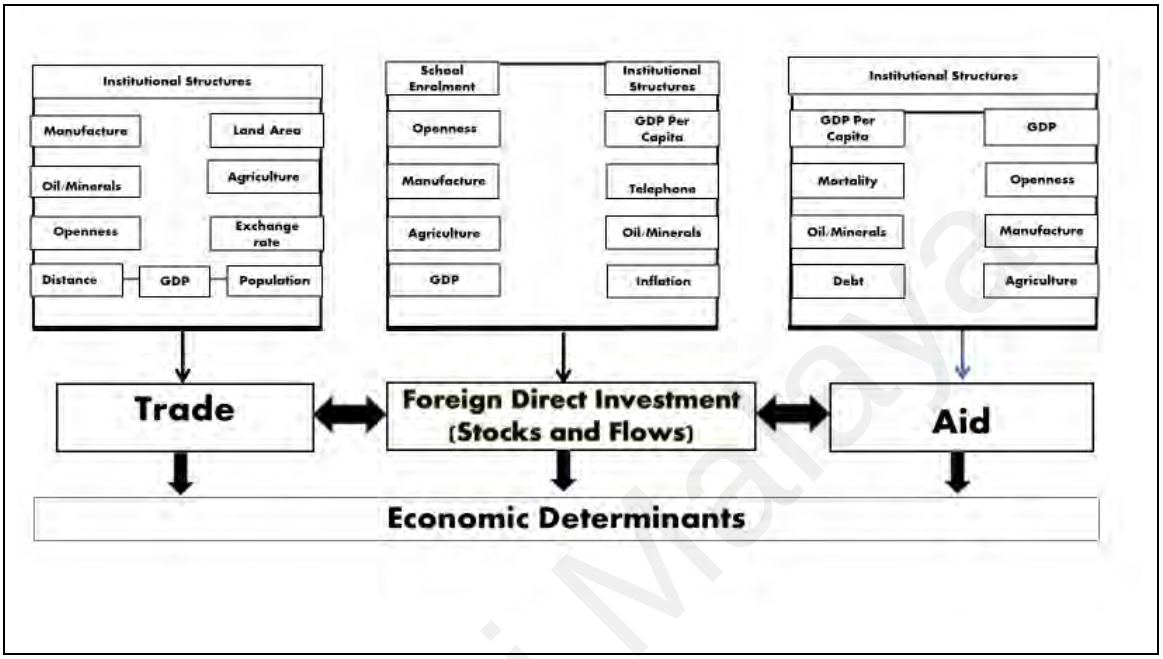

Figure 3.1: Conceptual Framework

Oil and minerals imports share is expected to be positively correlated with China's trade and FDI. However, China's aid is expected to be negatively correlated with oil/minerals exports and positively correlated with oil/minerals imports. More importantly, arguments on China's SOE's engagement with countries with weaker institutional structures for undue commercial gains (Zafar, 2007; Alden, 2012; Tull, 2006; Kolstad & Wiig, 2012) lead to the inclusion of institutional quality variables in the estimations and the subsequent testing of the following hypotheses.

Hypothesis 1: Oil/minerals positively attract China's imports

Hypothesis 2: Oil/minerals positively attract China's FDI stocks and flows

Hypothesis 3: Oil/minerals imports positively attract China's aid for altruism

Hypothesis 4: Oil/minerals exports negatively attract China's aid for trade

Hypothesis 5: Political instability and corruption attract China's trade, FDI and aid

3.3 Sample and Data

3.3.1 Selection of Sampled Countries

As stated in the introductory chapter, eighteen (18) countries were selected out of the twenty-four (24) oil and minerals exporting African countries. The eighteen countries were selected from the International Energy Agency database (2016), based on the existing bilateral relationships between them and China and the oil market direction. They are; Nigeria, Angola, Algeria, Egypt, Libya, Chad, Gabon, Ghana, South Africa, Equatorial Guinea, Congo, Cameroon, Tunisia, Cote D'Ivoire, Congo (DRC), Mauritania, Zambia and Ethiopia. The basis for the selection is firstly due to the fact that most of the countries are important oil/minerals-exporting countries to China, they rely heavily on oil and minerals trade, with well over 90 per cent of total exports, 40 per cent of FDI, about 85 per cent of foreign exchange earnings, and between them they account for 70 per cent of China's imports from Africa in 2014 (Tralac, 2018). In the case of Nigeria, Angola, Algeria, Egypt, Congo and Libya, they ranked among the top thirty world oil producers in 2016 (International Energy Agency, 2016).

However, Sudan and South Sudan were left out despite being one of China's major oil trading partners, because South Sudan was created out of Sudan in 2011 after the civil war that was borne out of resources that were not properly allocated. Also, excluded from the sample are Niger, Morocco, Malawi[15] and Zimbabwe. As for Niger, its oil production commenced in 2011. On this premise, including Niger Republic, Sudan and South Sudan as selected countries will create estimation error due to missing data since the study is from 1992. On the other hand, Morocco is an African country but politically it is not a member of AU. Malawi and Zimbabwe's oil production capacity is less than 500barrel

[15] See Gamula et al. (2013) for details on energy sector in Malawi.

daily, and there are several missing trade data for these countries. Hence they do not export crude oil as their main exports to China. Going by the above inference, the six countries oil/minerals exports to China are negligible; therefore, adding them to the analysis will lead to biased results.

Secondly, given many countries (54) in the African region, the comprehensive data required for the intensive analysis, and the problem of data unavailability peculiar to African countries, it was considered best to focus on the oil/minerals producing countries which represent the most important economic consideration for China's engagement in line with the focus of this study (Edwards & Jenkins, 2014; Foad, 2011). Confirming the importance of some of the selected countries, Foad (2011) noted that there has been economic growth rate across Africa and Middle belt due to China's engagement with natural resources based economies, coupled with the openness of their local markets and liberalisation in the past twenty years that has led to more exceeding trade growth rate over economic growth rate. Hence, this is the motive for selecting oil/minerals exporting countries in Africa. Also, focusing on the group with similar economic and market characteristics (Büthe & Milner, 2008) allows the researcher to carry out a thorough investigation and guard against biased analysis on the actual determinants of China's engagement using important institutional and sector-specific variables which are very few in the existing studies.

3.3.2 Data Description

The study period covers the years 1992 to 2015. The period of analysis coincides with when China renewed its relations with Africa and is also guided by data availability because most of the bilateral trade data were not available prior to 1992. As well, China's bilateral FDI and Loans acceptable OECD data became available from the year 2000 upward. Since the focus is on determinants of China's economic engagement in oil and

minerals exporting African countries, and Chinese import is assumed to be overwhelmingly oil/minerals, the study employed the UN-Comtrade data to estimate the sector specify trade (import and export) that determines China's economic motives. The UN-Comtrade data contain the reporting values of cross-importation and exportation by country, sector and year (He, 2013). However, there are several missing and zero data in the observations, hence, the use of mirror data method and reporting country imports, instead of the partner country exports are the two approaches used to deal with it. This is not strange for sub-Saharan African countries; these countries usually have issues of several missing data. Therefore, there are two methods of selecting imports and exports UN-Comtrade data for sub-Saharan African countries related studies, the first is the mirror data method, in which it is recommended to use reporters for which statistics are believed to be the most accurate and to keep using the same reporter for the full period if building time series (He, 2013). According to He (2003), if South Africa's imports from China are missing for some selected years and a complete-time series is required, then, it is better to rely on China's exports to South Africa for every year, even if South Africa's imports from China's is available for some of them. Otherwise, year to year trade value variations may reflect a shift from China to South Africa as a reporter rather than actual changes in trade flows. The other method is to use UN-Comtrade import data of reporting country since imports are recorded based cost, insurance and freight (CIF) while exports are free on board (FOB). For instance, for a given nation, imports are usually registered with more accuracy than exports because imports generate tariff revenues while exports don't, and this may represent a 10 per cent to 20 per cent difference. Thus, the trade data, which are part of the main control variables were categorised into agricultural products, manufacturing products and oil/minerals products. The structural composition is based on the UN-Comtrade Harmonized System (HS) 1-99 nomenclature. Where HS 1-24 is agriculture, HS 25-27 is crude oil-minerals, and HS 28-99 is manufacturing. Also, the

UN-Comtrade aggregate trade data are used as the dependent variable for the objective one.

For objective two's dependent variables, annual disaggregate bilateral China's FDI (stocks and flows) to Africa data is obtained from the United Nations Conference on Trade and Development (UNCTAD), foreign direct investment database will be employed over the period of 2000-2015. The time span is due to unavailability of bilateral China-Africa data that conform with OECD and IMF standard prior to the year 2000. As well, China's annual bilateral aid (loans) data used as the dependent variable for objective three are obtained from China Africa Research Initiative (CARI) database from 2000-2015 (SAIS China-Africa Research Initiative, 2016).

The institutional quality country-level time series data are obtained from the World Bank's World Governance Indicators database. These institutional variables data became available only from 1996 (Kaufmann, Kraay, & Mastruzzi, 2010). The data for geographical variables are sourced from the CEPII Distance database (http://www.cepii.fr/distance/). Other main control variables such as GDP, per capita income, external debt total, openness, inflation, school enrolment, fix telephone, mortality rate, population and real exchange rate, are obtained from World Bank's World Development Indicators database. All nominal values are expressed in constant prices.

3.4 Model Specification

This section is sub-divided into three subsections to give details on each of the models specified to test the research objectives. Also, this is done to provide detailed information on the selection of the estimation techniques used to achieve the objectives stated in chapter one. For instance, the study adopts and modifies the gravity model of Anwar and Nguyen (2011), De Grauwe et al. (2012), Foad (2011), Frankel, Stein, and Wei (1995) and He (2013) to estimate trade model which is objective one. Also, the study uses panel

data techniques adapted from the studies of Anwar and Nguyen (2011), Biggeri and Sanfilippo (2009), Cheng and Ma (2010), Kolstad and Wiig (2011), Kolstad and Wiig (2012) and Neumayer and Spess (2005) with some modifications to estimate objective two, and modifies Biggeri and Sanfilippo (2009), Calì and te Velde (2011), Vijil and Wagner (2012) and Younas (2008) models to analyse objective three models.

3.4.1 Trade Model

To answer the research question one (1), the augmented Gravity Model of trade is utilised to analyse what determines the trade between China and oil/minerals exporting countries in Africa. The advantage of the gravity model is that country-specific model can be derived from it. This country-specific model provides an answer for the total trade volume of all the trading partners. The hypothesis on GM indicates that exports of country i (origin) and imports of country (j) destination are proportional to individual nations economic size that is proxy by GDP and negatively related trade impediments between them. In its simplest form, the standard GM is:

$$IX_{ij} = A\frac{Y_i^{\beta_1} Y_j^{\beta_2}}{D_{ij}^{\beta_3}} \qquad (3.1)$$

Where IX_{ij} is imports of countries i and j; Y_i and Y_j is the income of countries i and j and is used as a proxy for economic size; D_{ij} measures distance between countries i and j and A is a constant term. The basic importance of this gravity model is that it does not answer for the volume of total trade flows of the trading partners and country-specific model can be derived from it. Similarly, the standard GM in equation (3.1) can be expressed in panel data framework by including the natural logarithm (ln) and error term (ε) as seen in equation (3.2).

Hence, the linear panel framework is depicted as:

$$ln\, IX_{ij} = \beta_0 + \beta_1\, ln\, Y_i + \beta_2\, ln\, Y_j + \beta_3 lnD_{ij} + \varepsilon_{ij} \qquad (3.2)$$

Thus, following the augmented gravity models of Anwar and Nguyen (2011), De Grauwe et al. (2012), Foad (2011), Frankel et al. (1995) and He (2013) the linearised GM in equation (3.2) is modified ($ln\, IX_{ij}$) to capture the sector-specific trade of China (i) from Africa (j) in equation (3.3). Also, it is augmented in equation (3.3) to include additional variables such as share of oil, manufacturing, agriculture, and other control variables (economic, institutional and demography). The model specified in equation (3.2) can be estimated using an ordinary least square econometric technique with the use of cross-section data (panel technique) that will help to capture the trade effects and trade relationship in a specific time span with the classical gravity model. Thus, natural logarithm by one year is applied to disaggregate share of oil/minerals, disaggregate share of manufacturing, disaggregate share of agriculture, other explanatory variables and dummy variables. Also, $'t'$ is time trend variable and ε is the error term that reflects other non-identified influences on the country $j's$ trade of all commodities by country i's at year t.

The gravity model in the log-linear form can be written as:

$$ln\, IX_{ijt} = \beta_0 + \beta_1\, ln\, Y_{it} + \beta_2\, ln\, Y_{jt} + \beta_3 lnD_{ijt} + \beta_4 lnN_{ijt} + \beta_5 lnN_{ijt} + \beta_6 lnOShr_{ijt} + \beta_7 lnAShr_{ijt} + \beta_8 lnMShr_{ijt} + \beta_9 C_{ijt} + \varepsilon_{ijt} \qquad (3.3)$$

Where:

$ln =$ Represent natural logs of variables

Yi (Yj) = GDP for country i and j

Dij = Geographical distance between country_i and country_j

$Ni(Nj)$ = Represents the population size of country_i and country_j

$OShr_{ji}$ = Oil/minerals share of country$_i$trade from country$_j$

$AShr_j$ = Agriculture share in country$_i$trade from country$_j$

$MShr_j$ = Manufacturing share in country$_i$trade from country$_j$

C_{ij} = Dummy variables

β = Regression coefficients

Hence, to eliminate any form of biases stemming from "gold-medal error" (Baldwin & Taglioni, 2006), that is, incorrect omission and specification of the error term, the inclusion of time-varying country dummies is the typical approach and it is regarded as multilateral trade resistance (Anderson & van Wincoop, 2003). Therefore, included in the trade model are dummies for time and country-specific effects to account for all time-invariant multilateral price terms (heterogeneity) (Anderson & van Wincoop, 2003; Baier & Bergstrand, 2007; Baldwin & Taglioni, 2006; De Grauwe et al., 2012; Edwards & Jenkins, 2014; Giovannetti & Sanfilippo, 2009). The country fixed effects in all instances cater to any other possible effect of time-varying country-specific factors such as location and geography in the model. Therefore, equation (3.3) is modified to accommodate dummies for time and country effects in equation (3.4). The included dummies in the gravity model in equation (3.4) are time effects $\gamma_t$and country-specific trends λ_{ijt}in the cost of trading that are independent of the dependent variable ($ln\, Import_{ijt}$).

Thus, the gravity model of trade to analyse objective one is specified as follows:

$$\begin{aligned} ln\, Import_{ijt} = {} & \beta_0 + \beta_1 lnGDP_{it} + \beta_2 lnGDP_{jt} + \beta_3 lnPOP_{it} + \beta_4\, ln\, POP_{jt} + \beta_5 InDistw_{ijt} \\ & + \beta_6 EXR_{jt} + \beta_7 lnOPENSS_{ijt} + \beta_8 lnOILShr_{ijt} + \beta_9 lnAGRICShr_{ijt} \\ & + \beta_{10} lnMANUShr_{ijt} + \beta_{11} POLSTAB_{ijt} + \beta_{12} Corrpt_{ijt} + \beta_{13} lnLAREA_{ijt} \\ & + \beta_{14} LLOCK_{ijt} + \gamma_t + \lambda_{ijt} \\ & + \varepsilon_{ijt} \end{aligned} \qquad (3.4)$$

Where:

ln $Import_{ijt}$ = Represents log of total trade for country_i and country_j

GDP_{it} = GDP for country_i

GDP_{jt} = GDP for country_j

POP_{it} = Population growth for country_i

POP_{jt} = Population growth for country_j

$Distw_{ijt}$ = Geographical distance between country_{ijt}

EXR_{jt}= Represents real effective exchange rates between country_i and country_j

OPENSS_{ijt}= Trade openness as a ratio of exports and imports to GDP

$OILShr_{ijt}$ = Oil/minerals share of country_itrade from country_j

$AGRICShr_{ijt}$ = Agriculture share of country_itrade from country_j

$MANUShr_{ijt}$= Manufacturing share of country_itrade from country_j

$POLSTAB_{ijt}$ = Level of political instability and absence of violence

$Corrpt_{ijt}$ = Level of Corruption

$LAREA_{ijt}$ = Total Land Area

$LLOCK_{ijt}$ = Land Locked Countries

γ_t = Time effects

λ_{ijt} = Country-specific effects

In the model, the dummy variable landlocked takes the value of 1 if the exporting country is landlocked and 0 if otherwise. The inclusion of share of oil/minerals, agriculture and manufacturing will help to investigate whether oil/minerals are the main imports determining factor in China and Africa engagement, while variables such as

political instability, and corruption are introduced to identify the significant influence of institutional factors on China-Africa trade. In addition, the impact of binary variable landlocked countries ($\beta_{14}LLOCK_{ijt}$) were examined to determine whether they impede on trade or otherwise. Likewise, the impact of political instability and corruption ($\beta_{11}POLSTAB_{ijt}\ and\ \beta_{12}Corrpt_{ijt}$) where higher values indicate good institution and positive or negative behaviours of the variables when examined will determine the progress of China-Africa engagement.

Based on the foregoing, the gravity model of trade specified in equation (3.4) will use unbalanced panel data and the estimation techniques adopted are pooled OLS, fixed effects (FE), generalised least squares (GLS), Poisson Pseudo Maximum Likelihood (PPML) and bias-corrected Least Squares Dummy Variable (LSDVC). Also, the logarithm transformation of the variables in equation (3.4) partly helps to address the problem of endogeneity and to interpret the coefficients of the results in elasticities form. However, the logarithm transformation of the trade variables implies that observation with zero trade with loss, which is numerous for trade flows like $lnOILShr_{ijt};\ lnAGRICShr_{ijt}\ and\ lnMANUShr_{ijt}$. One common approach of tackling loss of zero trade values due to logging is to use $ln(1 + Import_{ijt})$, but the shortcoming of this approach is that it overlooks the fact that "1+" is not an immaterial adjustment when the trade is zero is close to zero. Therefore, a better approach is to use PPML. The use of PPML (a nonlinear estimation method) to analyse the gravity model of trade helps to capture the zero-trade matrixes that are prevalent in trade data and by default, PPML is semi-robust against bias (Silva & Tenreyro, 2011), while the dynamic LSDVC estimator for gravity trade model affords recourse for simultaneity, spatial characteristics and endogeneity bias of the model.

3.4.2 Foreign Direct Investment Model

To answer research question two, panel data models were specified. Panel technique has the capability to capture the applicable relationship between the variables of interest over the time span and monitor the unperceived or unobserved individual effects of the countries under study. Also, China's FDI to Africa was divided into two (stocks and flows) and then relate each to sector-specific trade. The division helps to identify whether FDI stocks or FDI flows determine more economic engagement, as well as whether specific sector exports grow more with stocks or with flows. Hence, the first-panel model specified has China's FDI stocks destination as the dependent variable and the second-panel model specified has Chinese FDI flows by destination as the dependent variable. The model specification and the choice of the inclusion of bilateral FDI flows as the dependent variable is based on Cheng and Ma (2010), Kolstad and Wiig (2011), Kolstad and Wiig (2012) and Neumayer and Spess (2005) studies that argue that FDI outflow to host country abroad is a better measure of investment flow. In the second-panel data model specified, the dependent variable is the stocks of China's FDI by geographical destination which is based on Anwar and Nguyen (2011), Biggeri and Sanfilippo (2009) and Cheng and Ma (2010) slightly modified models. They argue that the stock of FDI in the host country by the investing nation is a superior estimate of FDI. Also, the core explanatory variables included in the models are agriculture imports of country i to country j ($AGRICShr_{ijt}$), oil/minerals imports of country i to country j ($OILShr_{ijt}$), manufacturing imports of country i to country j($MANUShr_{ijt}$), institutional quality variables and other economic factors. For institutional quality, political instability is used to measure the strength of the country's stability which is likely to influence FDI (Asiedu, 2002, 2006). The other economic factors included in the model are GDP_{jt}, per capita income $(GDPperk_{jt})$, infrastructure development which is proxy as fixed telephone ($FixPhone_{jt}$) trade openness ($OPENSS_{jt}$) which helps capture the degree of

liberalisation and the level of human capital development proxy as school enrolment ($Schenrol_{jt}$) of country j at time t. As simple as the models look, first, it will help to identify which African trade and institutional factors can either restrain or spur Chinese FDI. Second, the use of these models will help to know the other parameters that increase the attractiveness of FDI from China. It is worth mentioning that due to the short time span of standard China's bilateral FDI data (the dependent variables) obtained from UNCTAD, there may be a little variation in the included variables.

Based on the modified models of Biggeri and Sanfilippo (2009), Cheng and Ma (2010), Kolstad and Wiig (2011) and Kolstad and Wiig (2012) the panel equation to be estimated for China's FDI stock are:

$$lnChineseFDIstock_{ijt} = \beta_0 + \beta_1 lnGDP_{jt} + \beta_2 Infl_{jt} + \beta_3 lnAGRICShr_{ijt} + \beta_4 lnOILShr_{ijt} + \beta_5 lnMANUShr_{ijt} + \beta_6 lnFixPhone_{jt} + \beta_7 lnOPENSS_{jt} + \beta_8 lnGDPperk_{jt} + \beta_9 lnSchenrol_{jt} + \beta_{10} POLSTAB_{jt} + \varepsilon_{ijt} \quad (3.5)$$

Where:

$ln =$ Represent natural logs of variables

$ChineseFDIstock_{ijt}$= China's FDI out stocks in country$_j$

GDP_{jt} = GDP for country j

$Infl_{jt}$ = Inflation rate of country$_j$

$AGRICShr_{ijt}$ = Agriculture share of country$_i$ imports from country$_j$

$OILShr_{ijt}$ = Oil/minerals share of country$_i$ imports from country$_j$

$MANUShr_{ijt}$= Manufacturing share of country$_i$ imports from country$_j$

$FixPhone_{jt}$ = Fixed telephone subscriptions per 100 people in country$_j$

$OPENSS_{jt}$= Trade openness as a ratio of exports and imports to GDP

$GDPperk_{jt}$ = Income per capita of $country_j$

$Schenrol_{jt}$ = School enrollment per 1,000 of $country_j$

$POLSTAB_{jt}$ = Level of political instability and absence of violence

β = Regression coefficients

t = Time

ε_{ijt} = Error term

Also, following the modification of the models by Biggeri and Sanfilippo (2009), Cheng and Ma (2010), Kolstad and Wiig (2011) and Kolstad and Wiig (2012) the specified panel equation for Chinese FDI flows is as follows;

$$lnChineseFDIflow_{ijt} = \beta_0 + \beta_1 lnGDP_{it} + \beta_2 lnInfl_{jt} + \beta_3 lnAGRICShr_{ijt} + \beta_4 lnOILShr_{ijt} + \beta_5 lnMANUShr_{ijt} + \beta_6 lnFixPhone_{jt} + \beta_7 lnOPENSS_{jt} + \beta_8 lnGDPperk_{jt} + \beta_9 lnSchenrol_{jt} + \beta_{10} POLSTAB_{jt} + \varepsilon_{ijt} \quad (3.6)$$

Where:

$ln =$ Represents natural logs of variables

$ChineseFDIflow_{ijt}$= China's FDI outflow to recipient $country_j$

Thus, pooled OLS, random effects (RE), GLS and instrumental variable two-stage least squares (2SLS) econometric techniques were employed to estimate the models. All things being equal, pooled OLS should have been enough to estimate the models because of the less variation in the data set used because of unavailability of standard bilateral China-Africa FDI data prior to the year 2000; and because time-invariant-country-specific variables such as colonial ties, geographical destinations, common colony, or

language are not included in the panel models. However, it is assumed that the explanatory variables GDP and per capita income are possibly related to FDI dependent variables; that is, they are affected by and may have affected FDI, thereby creating endogeneity issue in the regression. This is the case since GDP and GDP per capita are theoretically the measures of economic growth and development respectively, and there is consistent evidence that MNCs and other foreign investors tend to invest more in countries that are witnessing more of economic growth and development (Asiedu, 2002, 2006). So, they can be used as the dependent variables as well as independent variables. One plausible approach to resolve the endogeneity issue is using simultaneous estimation techniques like the instrumental variable two-stage least squares (2SLS). Still, the 2SLS approach is not devoid of shortcomings. The first shortcoming is choosing appropriate instruments for developing country studies is a bit difficult, and the second shortcoming is that if care is not taken weak instruments that may lead to bias results may be chosen.

Then, given the above reasons, the dependent variables and all the explanatory variables in monetary values were transformed to natural logarithm and lag by 1 year, except for the institutional quality variable which is an index. The use of log specification is to minimise skewness of the model distribution, control for all time-invariant country's factors, circumvent endogeneity issues in the models and to considerably improve the model fit (Wooldridge, 2003). Nevertheless, using natural logarithm specification alone may be too naïve an approach to circumvent potential endogeneity problems in the OLS regressions (Reed, 2015). Therefore, the instrumental variable approach is by far superior to the use of suspected lagged variables. Hence, the study employs simultaneous estimation (instrumentation strategy) 2SLS techniques and uses lags of the FDI (stocks and flows) variables, and other additional control variables such as GDP growth, population, total land area, landlock, common language and colony that are considered as important factors in determining FDI but are outside the estimating models. The

appropriateness is confirmed through tests of overidentifying restrictions, Durbin-Wu-Hausman chi-sq. test and heteroskedasticity to test for the validity of the instrumental variables (Biggeri & Sanfilippo, 2009; Reed, 2015).

3.4.3 China Foreign Aid Model

To achieve the third objective, the determinants of China's foreign aid in oil/minerals exporting African countries will be examined using panel data sets. The objective is measured by modifying the models of Biggeri and Sanfilippo (2009), Calì and te Velde (2011), Vijil and Wagner (2012) and Younas (2008) making China's bilateral loan (aid and financial flows) to Africa ($ChinaLoans_{ij}$) as the dependent variable. Aid as the dependent variable is assumed to be the sum of both physical capital and complementary capital, which overall improves the marginal productivity through investment in infrastructure that helps to connect market. Basically, there are two motives of giving aid, either for altruism motive or because of the trade benefit (tied aid) the donor country intends to achieve. To examine which factors, determine China's motive for giving aid to African oil/minerals exporting countries, two models will be specified to capture whether it is for 'altruism' or 'trade-tied-to-aid'. The use of these models brings out how aid affects each sectoral trade (imports and exports) with other economic and institutional explanatory variables. In the two models disaggregate bilateral imports is used to examine aid based on 'altruism' motive and disaggregate bilateral exports is used to examine whether 'aid-is-tied-to-trade'. Hence, both imports and exports are classified into agriculture ($AGRICShr$) manufacturing ($MANUShr$) and oil/minerals ($OILShr$). The institutional quality variable included is political instability ($POLSTAB_{jt}$) and control of corruption $\left(Corrpt_{jthe\,t}\right)$; and it is expected to be negatively related to aid (Asiedu, 2002, 2006). This implies that aid ($ChinaLoans$) from country i are negatively related to political instability and control of corruption in country j. Also, following Biggeri and

Sanfilippo (2009), Younas and Bandyopadhyay (2007), total external debt, trade openness, GDP, per capita GDP and infant mortality rate of country j are included in the models.

Thus, the import panel model for aid donor country to the recipient country is specified as follows:

$$lnChinaLoans_{ijt} = \beta_0 + \beta_1 lnDebt_{jt} + \beta_2 lnIMAGRICShr_{ijt} + \beta_3\ lnIMOILShr_{ijt} + \beta_4 lnIMMANUShr_{ijt} + \beta_5 Mortalityrate_{jt} + \beta_6 lnOPENSS_{jt} + \beta_7 lnGDPperk_{jt} + \beta_8 lnGDP_{jt} + \beta_9 POLSTAB_{jt} + \varepsilon_{ijt} \quad (3.7)$$

Where:

$ln =$ Represents natural logs of variables

$ChinaLoans_{ijt}$= China's bilateral loans to the recipient $country_j$

$Debt_{jt}$ = Total Debt external

$IMAGRICShr_{ijt}$ = Imports Agriculture share of country_i from country_j

$IMOILShr_{ijt}$ = Imports Oil/minerals share of country_i from country_j

$IMMANUShr_{ijt}$= Imports Manufacturing share of country_i from country_j

$Mortalityrate_{ijt}$ = Infant mortality rate

$OPENSS_{jt}$ = Trade openness as a ratio of exports and imports to GDP

$GDPperk_{jt}$ = Income per capita of $country_j$

GDP_{jt} = GDP for country j

$POLSTAB_{jt}$ = Level of political instability and absence of violence

β = Regression coefficients

t = Time

ε_{ijt} = Error term

Also, to determine whether China's aid to oil/minerals African exporting countries is to promote its manufacturing goods, then, the export panel model for the aid donor country to a recipient country is specified as follows:

$$lnChinaLoans_{ijt} = \beta_0 + \beta_1 lnDebt_{jt} + \beta_2 lnEXAGRICShr_{ijt} + \beta_3\ lnEXOILShr_{ijt} + \beta_4 lnEXMANUShr_{ijt} + \beta_5 Mortalityrate_{jt} + \beta_6 lnOPENSS_{jt} + \beta_7 lnGDPperk_{jt} + \beta_8 lnGDP_{jt} + \beta_9 Corrpt_{jt} + \varepsilon_{ijt} \quad (3.8)$$

Where:

$ln =$ Represents natural logs of variables

$ChinaLoans_{ijt}$= China's bilateral loans to the recipient $country_j$

$Debt_{jt}$ = Total Debt external

$EXAGRICShr_{ijt}$ = Exports Agriculture share of country_i from country_j

$EXOILShr_{ijt}$ = Exports Oil/minerals share of country_i from country_j

$EXMANUShr_{ijt}$= Exports Manufacturing share of country_i from country_j

As the dependent variable time span is short (from the year 2000 upwards), there may be a little variation in the data set. Hence, the endogeneity issue may not likely arise because Chinese aid is minor in the recipients' African countries. Nevertheless, all the explanatory variables are lagged by 1 year, except for the institutional quality index and infant mortality rate to solve the problem of potential endogeneity in the regression and

to put the coefficients in elasticity forms. Therefore, to analyse the specified aid models in equation (3.7) and (3.8), pooled OLS, FE, GLS and dynamic panel estimations techniques were used. The pooled OLS is appropriate in estimating the aid model. Still, using the OLS approach could create a potential serial correlation and heterogeneity issues in the regression, taking into consideration simultaneous issue that could occur between the dependent variable and some independent variables such as per capita income, GDP and external debt total in the models. Although, this OLS problem can be fixed with the use of the FE model (especially for equation 3.7) since β_0 captures all time-invariant factors in the model and GLS model will be used for robustness check. But then again, with the use of FE, important information may be left, resulting in a substantial loss in the degree of freedom in the regression results (Selaya & Sunesen, 2012).

Thus, the regressors list is extended to include natural logarithm of the variables, which captures agglomeration effects and time-country-specific factors. In the specified models, the natural logarithm of explanatory variables except political instability and infant mortality rate variables were taken, while the dependent variable 'Loan' (aid) cannot be logged without losing the observations with zero (0) aid. Therefore, a better method of handling this type of issue is to standardise variable 'Loan' and allow the panel data estimator to determine how to handle cases where aid is zero (Wagner, 2003). Also, measurement error is likely to be visible in China's aid data since the values recorded are based on reported voluntary disbursement by the Chinese government agencies. Such errors could arise from a miscalculation of the actual capital disbursed to complete a project, differences in the value of the currency, and inefficient project reports that may make China's aid coefficient to be inconsistent. To avoid these potential estimation errors, the study resorts to the use of Pesaran dynamic fixed effects which generates internal instruments to control the likely endogeneity, control for unobserved recipient, and allow the parameters to vary across cross-sections in the short run, but restrict homogeneity of

the parameters in the long run (Musibau, Yusuf, & Gold, 2019; Pesaran, Shin, & Smith, 1999).

3.5 Variables Description

In this section, all the dependent and independent variables used in this study are described in sections 3.5.1 and 3.5.2. The dependent variables are framed based on theoretical and past empirical literature review in chapter 2 that indicate the relevance of the three economic channels of China and Africa engagement; which are trade, FDI and aid. Similarly, drawing from the resource-endowment theory of international trade, the Dunning's eclectic analytical framework of foreign investments and other theoretical and empirical literature discussed in the previous chapters, the study includes several independent variables (Biggeri & Sanfilippo, 2009; Eisenman, 2012; Zafar, 2007). The several explanatory variables included in the models are to capture what determines China's bilateral engagements with the selected oil/minerals exporting African countries. Although it is tempting to include as many explanatory variables as possible to understand their effects and how they determine China-Africa engagement vis-à-vis trade-FDI-aid, but concerns over the issue of multicollinearity and estimation errors deter the inclusion as suggested by some literature. Hence, the excluded variables may act as the potential limitation of the study. Yet, the established models are sufficiently robust to provide inferences for policy implications. The following sub-sections review the dependent variables and other explanatory variables included in the models.

3.5.1 Dependent Variables

i. China's Bilateral Trade (Imports and Exports)

The data on China's trade to Africa were obtained at 4- or 6-digit level of the Harmonized System (HS) and imports were used as the dependent variable for the gravity model of trade and were used as an explanatory variable in all the specified models.

Except for equation (3.8), where exports were used as an explanatory variable to determine China's economic motive for giving aid. As measured in the UN-Comtrade database, they are the sum of China's total exports of goods and imports of goods for each of the trading partner countries. Bilateral trade flow promotes trade and eases investment between countries having a trade agreement. In trade data, imports are recorded as cost insurance and freight (CIF), while exports are recorded as free on board (fob), and this may represent a 10 per cent to 20 per cent differences. For a given country, imports are usually recorded with more accuracy than exports because imports generate tariff revenues as compared to exports (He, 2013). Despite all efforts made by national and global agencies, data quality still varies among countries. Hence, it is recommended to use disaggregate imports and exports that are more accurate for the full period to build time series and to avert variations that may reflect a shift from its actual trade flows. Another justification for the use of China's imports and exports (reporters) over Africa's exports and imports data, is that China's trade data have fewer missing values when compared with Africa (He, 2013).

ii. China's Foreign Direct Investment

Foreign direct investment (FDI), as defined by UNCTAD (2014), is the long-term investment relationship between the overseas investor whose enterprise is domiciled in the host country. The primary measure of FDI attractiveness is China's bilateral inflows and out-stocks by geographical destinations which come from the United Nation Trade and Development UNCTAD database, and they capture the absolute amount of FDI inflows and out-stocks a host country receives. The FDI inflows as a dependent variable capture the relative attractiveness of individual African nation as a host for China's FDI and explicitly allow for competition among them for a fixed share of FDI to be divided (Neumayer & Spess, 2005). Also, FDI out-stocks as a dependent variable measures the

value of Chinese net indebtedness, capital, and reserve domicile in host African states at the end of the year. The choice of more comprehensive UNCTAD China's bilateral FDI data is to give unbiased estimation and follow the approach of Cheng and Ma (2010), Kolstad and Wiig (2011) and Kolstad and Wiig (2012) rather than the approved FDI outward used in the studies by Buckley et al. (2007) and Cheung and Qian (2009). According to Biggeri and Sanfilippo (2009) and Cheng and Ma (2010), FDI is an important variable that influences the volume of trade, that is, the more FDI a country receives, the more the trade, therefore, trade and FDI are interrelated as well as complimentary. Thus, positive, and significant relationships are expected between FDI inflows as the dependent variable and disaggregate product imports (i.e. agriculture, oil/minerals and manufacturing) and a positive correlation is expected between FDI stocks and the disaggregate product imports because of the more massive the stock, the bigger the investment rate and vice versa (Udo & Obiora, 2006).

iii. China's Foreign Aid (Economic Cooperation)

The dependent variable for the aid equation measures China's bottom-up loan to Africa taken from China Africa Research Initiative (CARI), Johns Hopkins University database (SAIS China-Africa Research Initiative, 2016). The loan data exclude medical, students' scholarships and other contribution to international organisations. CARI's approach is the first efforts to capture China's loan data from bottom-up, considering the hype and robust mythology associated with China's loan finance as a result of Beijing's ambiguous flows of foreign loans; With rarely published Chinese bank's specific financing agreements information and rarely disclosed details of the received finance by the recipients, coupled with being a non - member OECD - DAC. Although Chinese bank officials have made efforts to release from time to time on their African loan commitments, this is not systematic in either their constraints or specificity. Therefore, since aid is for economic

motives (trade-tied-to-aid), then, China's economic cooperation is assumed to be a strategy to have more access to recipient oil/minerals exporting African countries market. On this premise, a positive coefficient is expected for manufacturing. On the other hand, if aid is for 'altruism', a positive relationship is also expected between aid and oil/minerals imports.

3.5.2 Explanatory Variables

i. Institutional Quality Variables

Following Asiedu (2006), Dollar and Kraay (2003) and Foad (2011) this study uses two institutional quality[16] variables that influence the determinant of Chinese economic engagements in Africa. These variables have a direct bearing on the volume of China-Africa trade, FDI and aid interactions as discussed in chapter 2. Specifically, the level of political stability, the absence of violence/terrorism index and control of corruption index are included to reflect on whether a country has good institutions. The inclusion of these two variables further enriches the literature on bilateral trade, FDI and aid analysis. After all, not only economical and geographical factors determine the bilateral relationship, but political and strategic factors are as well important drivers of bilateral engagements and foreign policy. Consequently, it is expected that, with better institutions, more confidence will be installed in potential local and MNC investors in any economy. The data on institutional variables are obtained from the World Bank's Worldwide Governance Indicators (WGI) database that became available from 1996 and provides the best measure of institutional factors that have been widely used in literature.

[16] Six institutional variables index, such as; corruption, political stability, voice of accountability, rule of law, corruption, government effectiveness and regulatory quality were constructed by Kaufmann et al (2010) and obtained from World Governance Indicators (WGI), to measure the quality of institution.

(a). Political Stability and Absence of Violence/Terrorism Index

The variable measures perceptions of the likelihood of political instability and politically motivated violence, such as protests, riots, terrorism, interstate war, civil war, frequent military intervention, ethnic and religious conflicts that resulted into disrupting regular movement and business operations, property damage, death or injury. The variables as stated in WGI have values that range between -2.5 and 2.5 with lower values indicating a country's unstable polity and inadequate security and vice versa. According to the study of Reinhart and Rogoff (2003), Africa as a region is more susceptible to war and political instability than any other regions in the world. Asiedu (2006) and Sachs and Sievers (1998) argue that political instability is one of the institutional factors that deter FDI in Africa. Therefore, with a stable political climate, the more confidence will be installed in potential foreign investors, which will facilitate trade and aid in any economy. Hence, a significant coefficient and a positive sign are expected. However, Alden and Davies (2006), Alden (2012), Taylor (2006), Tull (2006) and Zafar (2007) opine that one of the major attractions of China to Africa is the weak institutional structure of some of the African states. If their claim holds, then, a negative relationship is to be expected.

(b). Control of Corruption Index

Control of Corruption perception index measures the level of corruption, that is, gross abuse of public power for private or elites' benefits within a government. The variables have values that range from -2.5 to 2.5, with higher values indicating a reduction in the level of a country's corruption and a lower value signifies an increase in corruption. About this thesis, the intuition is that the higher perception of a country's corruption level threatens trade flows and MNC ability to function as a deterrent to legal or regulatory penalties and reputational damage and this affects economic activities negatively. Therefore, a country with a high corruption stemming from weak institutions will display

insecurity on trade, and this generates a mark-up on goods traded (Anderson & Marcouiller, 2002; De Grauwe et al., 2012). Also, as indicated in the study of Tanzi and Davoodi (1998), government officials engage in extreme corruption through extorting kickbacks on infrastructural investment projects which resulted into the abandonment of development projects in most cases due to insufficient capital to complete the project. Thus, a negative relationship is expected between corruption and trade and between corruption and aid-tied-to-trade if China's engagement is attracted because of less corrupt control and vice versa.

ii. Oil/Minerals Imports/Exports Share

Several literature on China-Africa argue that one of the potential determinants of Chinese economic engagement with Africa is access to natural resources or primary commodities (Alabi et al., 2011; Biggeri & Sanfilippo, 2009; Buckley et al., 2007; De Grauwe et al., 2012; Eisenman, 2012; Foad, 2011; Rasiah & Gachino, 2004). To measure the natural resources or primary commodities, several proxies such as fuel export, share of ores and metal exports in total merchandise exports and in GDP were used in the studies of Biggeri and Sanfilippo (2009), Buckley et al. (2007), Cheung and Qian (2009), Kolstad and Wiig (2011, 2012), Shen et al. (2018) and Qian (2012). Also, Foad (2011) divided the share of a country's primary commodity export by the total trade export values obtained from Standard Industrial Trade Classification (SITC). However, apart from the fact that natural resources or primary commodities follow different economic mechanisms, these proxies do not sufficiently capture the real values of China's oil/minerals imports on the disaggregated product level. Therefore, to measure actual oil/minerals, the UN-Comtrade database provides detailed HS product classification (i.e. agriculture, oil/minerals, and manufacturing) by the reporting country and partner. The approach of using HS classification by-products to measure oil share follows Edwards

and Jenkins (2014) alternative measurements. Thus, $OilShr_{ijt}$ variable is one of the three (3) main exploratory variables that represent the share of a country's total China's imports and exports that are employed to measure the intensity of its sector-specific trade with Africa. So, all things being equal, if China's economic engagement with Africa is determined by oil/minerals imports and exports, then this variable will have a significantly positive effect on trade, FDI and on aid.

iii. Manufacturing Imports/Exports Share

To identify the determinant and trend in China's various products imports and exports by classifications, Edwards and Jenkins (2014) and He (2013) divided the share of a country's commodity export by the total trade export by laying particular emphasis on manufacturing goods. In this study, an alternative approach is established since one of the potential determinants of Chinese economic engagement with Africa in most of the literature is to access primary commodities (Biggeri & Sanfilippo, 2009; Foad, 2011; Johnston et al., 2015). Therefore, the alternative is by classifying trade into the agriculture share, oil/minerals share and manufacturing share. For specified trade measurement, the UN-Comtrade database provides detailed trade categories by the reporting country and partner and by-product. The $MANUShr_{ij}$ variable is one of the three (3) main exploratory variables that represent the share of total China's imports and exports that are manufacturing commodities and it is employed to measure the intensity. Thus, all things been equal, if China's economic engagement with Africa is determined by oil/minerals, then this variable will have a significant effect on trade, on FDI and on aid. However, the share of manufacturing China's exports to Africa oil/minerals exporting countries are expected to be positive in the aid equations (3.8) if China's motive for giving aid is for economic motive, that is if China's manufacturing is tied to aid.

iv. Agriculture Imports/Exports Share

One of the potential determinants of Chinese economic engagement be it trade, FDI and aid with Africa is access to primary commodities (Foad, 2011). To measure agriculture, the UN-Comtrade database provides detailed trade categories by the reporting country and partner and by-product. The $AGRICShr_{ij}$ variable is one of the three (3) main exploratory variables that represent the share of a country's total China's imports and exports, that is, agriculture commodities and it is employed to measure the intensity. Thus, all things being equal, if China's economic engagement with Africa determine by primary commodities, then variable ($AGRICShr_{ij}$) will have a positive effect on trade, FDI, and aid. Also, in the export aid model specified in equation 3.8, agriculture exports are expected to have a positive relationship on aid if China gives aid to Africa for economic motives and a negative relationship or none is expected if China's aid is for altruism.

v. Distance

The distance ($Distw_{ij}$) variable measures transportation cost between trading partners. Large distances between China and African countries are expected to reduce bilateral trade as this may lead to high transport costs and other impediments to trade like information asymmetry (Olofin et al., 2014). Furthermore, distance and GDP (income) are core variables in the gravity trade model, and the inclusion of the core variables in trade equation is justified by the imperfect competition and the Hecksher – Ohlin theories (Foad, 2011; Ghosh & Yamarik, 2004; Linnemann, 1966). Also, the underlying *a prior* expectation of traditional gravity model (Linnemann, 1966) states that trade is related positively to income and related negatively to bilateral transport cost (distance). Since adjacent countries trade more and are considered as natural trade partners, then, a positive effect is expected on trade (Frankel et al., 1995). Whereas, in the case of China-Africa,

distance ($Distw_{ij}$) is expected to be negative since they are not adjacent countries. Therefore, like the Newton model which has a negative impact on gravitation, the distance will have a negative coefficient in the imports model.

vi. Population

Population, as measured by World Development Indicator, represents the size of the economy. As expected, countries with a larger population ($ln\, POP_{ij}$) will export less, and vice versa. Therefore, population size can either impede trade or improve trade. In line with the studies of Blomqvist (1994), Johnston et al. (2015), Linnemann (1966), Mátyás (1997) and Oguledo and MacPhee (1994) trading countries population affected trade negatively and remain significant. On the other hand, the findings of Brada and Mendez (1983) show a significantly positive population ($ln\, POP_{ij}$). The size of the economy that is proxy as population is included only in the gravity model of trade to depict the size of China and Africa's economy. The inclusion in the trade model is in consonance with the studies of Agbodji (2008), Carrere (2006), Ghosh and Yamarik (2004), Johnston et al. (2015), Jugurnath, Stewart, and Brooks (2007), Magee (2008) and Martinez-Zarzoso, Felicitas, and Horsewood (2009) Thus, population in this study is expected to be negative and significant.

vii. GDP per capita

GDP per capita as measured by World Development Indicator database is to indicate the level of a country's economic development performance in the long run. It is assumed that nations with higher per capita income ($GDPperk_j$) are ranked higher regarding development. This is because some consumer in such nations will want to consume more of foreign goods and the ratio of capital-labour will be steady, indicating high capital productivity level. Basically, per capita income ($GDPperk_j$) variable is always excluded

from the gravity model of trade because the population is the alternative measures to per capita income (Biggeri & Sanfilippo, 2009; Buckley et al., 2007; Carrere, 2006; Ghosh & Yamarik, 2004; Hu & Van Marrewijk, 2013). However, GDP per capita is integrated into the FDI and aid models to check how the level of economic development affects these dependent variables (FDI and foreign aid). The inclusion of per capita income is consistently found to be determinants of FDI and aid in Africa (Biggeri & Sanfilippo, 2009; Büthe & Milner, 2008; Dupasquier & Osakwe, 2006; Neumayer & Spess, 2005; Qian, 2012; Younas & Bandyopadhyay, 2007). Also, this variable will be used to confirm the Heckscher-Ohlin-Samuelson's theory which hypothesised that nations without comparable income per capita have the tendency to engage more with one another over nations with comparable income per capita. Also, nations with lower GDP per capita attract more foreign aid over countries with higher per capita. Accordingly, a positive relationship is expected between FDI and income per capita, while a negative relationship is expected between foreign aid and GDP per capita.

viii. Gross Domestic Product (GDP)

The gravity model of trade asserts that high-income supports trade leads to higher production, more imports and more exports (Jugurnath et al., 2007). Theoretically, as GDP and output rise, the needs for goods and services become higher and production increases. The inclusion of GDP ($lnGDP_{ij}$) as a core variable in the trade model is validated in the theories of Heckscher – Ohlin, imperfect competition; and the traditional gravity trade model fundamental *a priori* expectation states that trade is related positively to income and related negatively to geographical distance (Ghosh & Yamarik, 2004; Hu & Van Marrewijk, 2013; Johnston et al., 2015). Also, the inclusion of GDP in the FDI and aid models is to measure market size and attractiveness motives of investors or donors, which Asiedu (2006), Buckley et al. (2007), Cheng and Ma (2010), Drogendijk

and Blomkvist (2013), Kolstad and Wiig (2011), Qian (2012) and Vijil and Wagner (2012) have empirically proved to be a robust determinant of FDI and aid, although, in most studies, GDP is positive and significant (Buckley et al., 2007; Thursby & Thursby, 1987; Tinbergen, 1962). However, few studies (Oguledo & MacPhee, 1994) found a statistically significant and negative relationship between GDP and the dependent variables. Thus, a positive relationship is expected on GDP in this study.

ix. Exchange Rate

Real exchange rate as a variable is included as an indicator to measure price competitiveness (Gani & Chand Prasad, 2008). Hence, a high exchange rate worsens the local currency purchasing power and affects sales. As such, it is expected that exchange rate volatility will influence MNC choice of production location. Hence, the exchange rate (EXR_j) sign and coefficient are basically indeterminate (Bacchetta & Van Wincoop, 2000; Jugurnath et al., 2007; Lane & Milesi-Ferretti, 2002). Although Udo and Obiora (2006) argue that the overvaluation of the exchange rate will deteriorate the balance of trade as exports will be discouraged; therefore, the coefficient of the exchange rate will relate negatively to trade.

x. Inflation

This variable is defined in the World Bank Development Indicators database as the consumer price index and shows the annual percentage change in the price to the average consumer for purchasing specific goods and services. It is used as a measure of macroeconomic stability. Therefore, it is expected to have an inverse effect on FDI. For instance, when currency crash and inflation is at double-digit and unstable, then, FDI ratio will be low; but when inflation is low and stable (Dupasquier & Osakwe, 2006), then FDI will have more impact on the populace and it reflects economic stability to the investors.

However, in the empirical results of Biggeri and Sanfilippo (2009) and Buckley et al. (2007), inflation on FDI has been positive, while in Asiedu (2006), inflation is negative. Therefore, the coefficient of inflation on FDI could be mixed.

xi. Trade Openness

The degree of a country's openness is essential to be included in the models to reflect the rate of the interconnectedness of African countries with China. Therefore, openness, as defined in WDI, is the sum of exports and imports of goods and services measured as a percentage share of GDP. Hence, the more open a country is, the lower the barriers to imports and more benefits to countries as their market expands for more exports. The market expansion is deemed as the output of liberalisation policies resulting in lower import duties, quotas, taxes, credits, and improved business environment among others to enhance free trade and facilitate improved technologies through FDI in the region. Therefore, in line with the studies of Bhattacharya, Montiel, and Sharma (1997); Dupasquier and Osakwe (2006); Lipsey (2000) and Morisset (2000), it is anticipated that the sign of the coefficients on openness will be positive.

xii. Total External Debt

Biggeri and Sanfilippo (2009) state that there is need to include total external debt in China-Africa aid model since the available data reveal that most of China's capital flows are channelled into heavily indebted or net aid African countries such as Angola and Sudan, who coincidentally are resources exporting countries. These aid recipient countries for some motives are not receiving enough aid from members of the OECD when compared to the numerous assistance from Beijing. Therefore, to obtain the proxy for the rate of indebtedness ($Debt_j$), total debt is obtained from the World Bank Development Indicators database. It measures the degree of a nation's indebtedness.

Thus, it is expected that the coefficient of debt to aid will be negative since a high level of external debt reduces the chances of getting aid (Selaya & Sunesen, 2012). However, in the case of China, a significantly negative coefficient may indicate a decrease in aid.

xiii. Land Area

The variable land area ($LAREA_{ij}$) as measured in the World Development Indicators is the country's total land area, which includes areas under inland bodies of water and coastal waterways (Ghosh & Yamarik, 2004; Jugurnath et al., 2007; Longo & Sekkat, 2004; Magee, 2008). All things being equal, as expected, large nations export more, so $\beta_{13} > 0$ $(positive)$. However, it is possible that relative size may also be important for comparative advantage reasons. Thus, if this scenario is the case, the sign of the coefficient of $LAREA_{ij}$ may also be indeterminate (Jugurnath et al., 2007).

xiv. Landlocked

A dummy variable is used to represent if country j is landlocked, then, $LLOCK_{ij} = 1$ and 0 (zero) if otherwise. However, where trading countries are landlocked or remote, accessibility to the hinterland of such countries decreases and transaction costs are consequently higher, hindering effective trading activities and thereby may lower the volume of trade transactions (Dollar & Kraay, 2003). A measure of whether the trading countries are landlocked is incorporated in the gravity model with the anticipation of a negative and significant relationship (Athukorala, 2012; Biggeri & Sanfilippo, 2009; Carrere, 2006; Ghosh & Yamarik, 2004; Gil-Pareja, Johnston et al., (2015); Llorca-Vivero, & Martínez-Serrano, 2008; Magee, 2008). This is because from a theoretical perspective, $LLOCK_{ij}$ is expected to increase transaction cost.

xv. School Enrolment

School enrolment ($Schenrol_j$) variable as captured in the World Bank Development Indicators database and it measures the level of the human capital of a nation. School enrolment is the primary and secondary (gross), gender parity index (GPI). According to Dupasquier and Osakwe (2006), a nation with inadequate human capital will discourage investors because the transaction cost will be high. According to Asiedu (2006), the coefficient of literacy is expected to have a positive relationship with FDI. Therefore, the variable is expected to be positive and significant in this specification also since higher human capital is a key factor that raises steady productivity and the choice of FDI location (Selaya & Sunesen, 2012).

xvi. Under Five Mortality Rate

The data on under-five mortality rates ($Mortalityrate_j$) is taken from the World Bank's World Development Indicators database to measure the monetary poverty or individual well-being in the aid equation. Precisely, this variable is defined as the human development and perspective is used as a proxy for determining the level of deprivation. According to Biggeri and Sanfilippo (2009), poverty proxy or physical needs in aid model can be measured through illiteracy rate. However, there are no comprehensive data for Africa on the level of illiteracy rate; hence, the preferred alternative is the infant mortality rate. Also, since the motive for giving aid is to reduce poverty and increase the literacy level, then, *ceteris paribus*, the more the level of illiteracy and mortality rate, the more the aid. On the premise, a negative relationship is expected between the dependent variable and mortality rate.

xvii. Infrastructure Development

The number of fixed telephones subscription per 100 people is used as a proxy to measure the level of infrastructure in African countries. Such infrastructure includes communications, energy, transport, and storage. The data are obtained from the WDI database. Although, Kamara (2013) argued that cell phone has been more prevalent in most sub-Saharan African countries within the last decade, therefore, the fixed telephone may not be a perfect measure of infrastructure. However, Asiedu (2002) questioned the reliability of using telephone mainlines as a proxy for infrastructure when the data is not readily available. Therefore, the choice of fixed telephone over a cell phone was due to the unavailability of reliable data on a cell phone, and the usage in this study is in line with the studies of Arvanitis (2005) and Vijil and Wagner (2012). Hence, in the studies of Asiedu (2006) and Kamara (2013) on FDI in Africa, infrastructure has a positive and significant value, and this shows that it is a determining factor influencing FDI and by extension enhances economic growth of the host country. However, a similar study carried out by Onyeiwu and Shrestha (2004), on the determinant of Africa's FDI, shows no evidence of infrastructure on FDI flows. Therefore, a mixed result is expected since most developing countries in Africa suffer from infrastructure deficiency, yet they are witnessing FDI from China and other regions.

3.6 Estimation Method

This section explains the estimation methods employed to achieve the highlighted objectives stated in Chapter one and its rationale for using it.

3.6.1 The Justification for Using the Gravity Model of Trade

Issac Newton conceptualised and demonstrated in his physics equation the gravity model (GM). GM has evolved into an adequate knowledge in regional science in characterising, examining and predicting spatial movements and flows. Its usage in the

theories of international trade, location, agglomeration, internalisation analysis was spearheaded by Linnermann (1966), Pöyhönen (1963) and Tinbergen (1962) to analyse trade relations of bilateral and regional cooperation in their respective studies. The gravity model is regarded as a model of theoretical rudiments in determining bilateral trade flows among countries. The GM of trade equation is represented as:

$$X_{ij} = A\frac{Y_i\ Y_j}{D_{ij}} \tag{3.9}$$

From the equation above, the GM postulates that trade flow (X_{ij}) is proportionate to the amount of their incomes ($Y_i\ Y_j$), diminishes with distance (D_{ij}) and A is constant (Evenett & Keller, 2002). The basic gravity model stated in equation (3.9) above can be modified and transform to a linear equation to estimate the model using econometric techniques in a logarithm form as follows:

$$ln\ X_{ij} = \alpha_1 + \beta_1\ ln\ GDP_i + \beta_2\ ln\ GDP_j + \beta_3 lnDistance_{ij} + \varepsilon_{ij} \tag{3.10}$$

Thus, the movement of people, beliefs, knowledge or goods between countries of pairs; other economic factors and other variables which are dummy is positively linked to the volume of their economy ($ln\ GDP_{ij}$) and negatively related to the distance (trade costs) (Olofin et al., 2014). The theoretical justification for this model is based on the Heckscher – Ohlin's model (Ghosh and Yamarik, 2004; Foad, 2011; Evenett and Keller, 2002). The proponents of this model believe that it works well empirically and it has been successful in predicting trade flows (Rose, 2000). Yielding reasonable parameter estimates, including political, technological and economic drivers (Eisenman, 2012). Therefore, researchers are turning to the gravity model of trade to fill the vacuum between the new trade theory and the conventional trade theories in analysing the China-Africa economic relations.

However, GM is criticised based on its usefulness in the empirical validity of the theory (Deardorff, 1998). Nonetheless, an investigation into the theoretical basis of the GM is on the increase and there seems to be a positive revitalisation of the theoretical and empirical credibility of the international trade model in the literature (Baier & Bergstrand, 2007; Feenstra, Markusen, & Rose, 2001). There are many variations of the gravity equation due to many empirical applications of the gravity model. Nevertheless, the gravity model shares some similar features within the literature intensity, such as; its application to explain trade model using export or import as the dependent variable; the use of GDP, GNP, GDP per capita and GNP per capita as proxies to measure the economic mass of importing and exporting countries (Rahman 2009; Montanari 2005). Also, distance is usually proxy as transportation cost between the trading countries and measured as the straight-line distance of the capital city of nation 'A' and nation 'B', or the commercial cities distance between trading partners. While other variables such as common border, common language, cultural ties, common colony and landlock that are proxy by dummy variables are included in the gravity model. Moreover, recent development in the modelling of bilateral and multilateral trade provides GM with better satisfactory theoretical underpinnings in the NTT and H-O theory of trade, which is considered essential, motivates the reliance of GM in the study of China-Africa trade[17].

Due to the nature of the data employed in this study, country-specific gravity model was employed (1 x 18 x 24) for the period of 1992-2015, and the sample consists of an unbalanced panel of 423 observations for import model in objective one. In applying the gravity model, the panel methodology becomes imperative as it accommodates both

[17] See; Anderson and van Wincoop (2003), Baltagi, Egger, and Pfaffermayr (2003), Carrere (2006), Feenstra (2002), Hu and Van Marrewijk (2013) and Johnson et al., (20115) for an overview of recent research efforts on gravity model.

cross-sectional data and time-series data which relate to information about objects over an extended period and capture the applicable relationship between the variables of interest (Baltagi, 2008; Flannery & Hankins, 2013; Gujarati & Porter, 2009). Another advantage of using panel data is that unperceivable/unobservable trading partner pairs (i.e. individual effect) can be monitored since its results allow for a higher degree of freedom which improves the estimation efficiency. Also, panel data are usually more revealing and encompassing additional variation and often less collinearity among variables (Hsiao, 2007). Although Ordinary Least Squares (OLS) can be used to estimate the GM, OLS estimates exclude individual effect that causes bias only when the individual effects are correlated to the regressors. On this premise, this study took some modifications with regards to GLS for gravity models from the empirical approach of Anwar and Nguyen (2011)[18] because it takes care of issues such as serial correlation and heteroskedasticity. Also, to cater to the zero values associated with trade data in sub-Saharan Africa, the country and year dummies are included in the Poisson Pseudo Maximum Likelihood (PPML) model. The RE estimation and FE are first employed to estimate the gravity model in equation (3.5) and the preliminary test, however, showed that neither RE nor POLS are appropriate. Therefore, the FE regression is used as the initial estimation technique, and the suitability of FE versus RE was determined after examining the standard Hausman x^2 statistic test for the benchmark regression. To control time effects and country effect, this study introduced year dummy and country dummy in the model for each country to be heterogeneous and maintain their individuality. Furthermore, the time-invariant variables such as landlock and distance in the gravity model are presumed not correlated since a country dummy is included in the

[18] Studies on China-Africa economic relations rarely uses GLS fixed effect regression, instead the pooled OLS and RE is preferred because of the time-invariant variables in the model.

GLS based fixed effects regression technique to tackle the problem more comprehensively. Ignoring these specific effects when in fact they exist in the trade model (objective one) may lead to biased results and misleading inferences (Baltagi et al., 2003; Carrere, 2006).

Nevertheless, to tackle this naïve aspect of the method (He, 2013), endogeneity and possible simultaneity issues with the GLS method, ideally, an instrumental variables (IV) estimators proposed by Anderson and Hsiao (1981, 1982), in which the second lag of the lagged dependent variable ($M^{i,t-2}$) is used as an instrument for the first difference of the time-lagged dependent variable ($M^{i,t-1}$) to eliminate individual unobserved heterogeneity (Bruno, 2005) and time-invariant effects should have been used. However, the IV estimators as observed by Blundell and Bond (1998), are weak instruments for small sample bias[19] and may not yield efficient estimators. For this reason, bias-corrected Least Squares Dummy Variable (LSDVC) dynamic panel estimator with bootstrap covariance is the preferred approach because it outperforms the IV estimators in almost all cases (it allows for short N and exogenous regressors) and gives consistent and unbiased estimates (Bruno, 2005; Stojkov & Warin, 2016).

3.6.2 The Justification for Dynamic Panel

Estimating the panel data model in equations (3.4), (3.5), (3.6), (3.7) and (3.8) with OLS or within-group, estimations will potentially lead to biased results and other difficulties. For instance, the explanatory variables are potentially endogenous, laden with measurement errors (Kamara, 2013); so also, the use of GLS estimator controls for unobserved individual effects by first differencing the variables. However, GLS estimator

[19] According to the rule of thumb to fulfil the requirement for the use of IV or generalized method of moment (GMM) estimators, the number of observation (N) in the panel data technique must be longer than the period (T) of observation, i.e. ($N > T$) (Bruno, 2005).

introduces into the regression endogeneity issue and it is not able to measure the dynamic relationship in unbalance panel, mainly as the lagged dependent variable in both the RE and FE estimations that correlates with the error term resulting into bias and inconsistent estimate. To resolve this problem, an instrumental variable approach is required, that is, to find adequate instruments that are correlated with the endogenous explanatory variable, but uncorrelated with the dependent variable (Neumayer & Spess, 2005). Also, the dynamic panel approach has proved efficient in estimating regressions. For these reasons, Least Square Dummy Variable Dynamic Panel Estimator is used to estimate trade equation (3.4), Generalised Two Staged Least Squares is employed to analyse equations (3.5) to (3.6), and Pesaran Dynamic Fixed Effect is used to estimate equations (3.7) and (3.8).

More so, in gravity model history, the dynamic panel is rarely used. However, the dynamic panel is considered for two reasons in the trade equation (3.4). The first direct effect is based on the heterogeneous firms grounded through deriving gravity equation for trade model that is micro-founded. Costantini and Melitz (2008) and De Benedictis and Taglioni (2011), attempted to examine the gravity model using a dynamic approach empirically. The second consideration is related to the empirical proposition where there is an element of persistence that is very strong when aggregate trade data is used and on bilateral or multilateral trade among countries at time $t-1$ and incline further to trade at time T (Bun & Klaassen, 2002; De Benedictis & Vicarelli, 2005; Fidrmuc, 2009). Moreover, the dynamic panel offers varieties of alternatives to researchers (Hsiao, 2007). The panel cointegration estimator which includes dynamic OLS or OLS that is fully modified was explored to control for endogeneity that is associated with dependent variables (Fidrmuc, 2009). This kind of contribution remains explanatory of which more can be explored in this line (De Benedictis & Taglioni, 2011).

3.6.3 The Poisson Pseudo – Maximum Likelihood Estimator Using the Gravity Model

In the gravity model estimation, log or log impasse is an inevitable issue that usually arises, as log-linearization is assumed to change the error term property, resulting in inefficient estimates due to heteroscedasticity. It is assumed that data that is homoscedastic will have the variance of the error term and expected value constant. Whereas, heteroscedastic data (like trade data) anticipated value of the error term is a function of the regressors. Therefore, OLS may not be sufficient because the conditional distribution of the dependent variables is altered (Luqman, Bakar, Aznin, Aziz, & Izraf, 2015).

Santos Silva and Tenreyro (2008), Silva and Tenreyro (2006, 2011) and Tenreyro (2007) indicated that the log-linearization of the empirical model in the presence of heteroscedasticity results from too inconsistent estimates because the expected value of the logarithm of a random variable largely depends on higher-order moments of its distribution. The variance of the error term may differ with the regressors as well as with the dependent variables or omitted variables since the primary source of the heteroscedasticity in the data is not unique (Luqman et al., 2015).

Furthermore, Silva and Tenreyro (2006) noted that Pseudo Poisson Maximum Likelihood (PPML) takes care of omitted zero trade values and endogeneity that are peculiar with OLS. In other words, PPML regressions ascertain the reliability of the predicted import value (Hu & Van Marrewijk, 2013). Devadason and Govindaraju (2014) adapted PPML to predict and compare China's engagement with Africa, Latin America and Asia. To Burger, Van Oort, and Linders (2009), Martin and Pham (2008), Martinez-Zarzoso et al. (2009) and Westerlund and Wilhelmsson (2011) the compared results of heteroscedasticity problems differ from the alternative estimators where zero values are

taken into cognisance. According to Silva and Tenreyro (2006), zeroes in trade data set and heteroscedasticity may generate two substantial bias issues. Firstly, the variance of ε_{ij} (multiplicative stochastic term) is unlikely to measure the distance and independent of country size. Because the projected logarithm values of random variable rely on mean and higher-order moments of its distribution, the variance of the error term ε_{ij}rely on the regressors, violating the condition of OLS consistency (Assane & Chiang, 2014). Secondly, the logarithm transformation of recorded bilateral zero trade data between countries (in small and poor nations sample selection) are automatically dropped from the sample, leading to about 30 per cent loss in the data point. These two problems can be resolved when the gravity equation is in its multiplicative form (Silva & Tenreyro, 2010).

The PPML estimator has additional properties for policy applied investigation which gives another dimension to the gravity model of trade literature. It is consistent even when dummy variables are included in a model and FE estimation technique is employed. The FE is essential as it has the uncommon property of nonlinear maximum likelihood estimators which is unknown to several researchers. This unknown property of FE is significant in the gravity model because theory consistent models need the insertion of FE by the importer and exporter. For this reason, PPML is used to capture the zero-trade matrix present in the import flows data. Also, based on the assumptions of PPML, the dependent variable in the gravity model is not logged. The PPML regression results will be compared with other estimations to see the variation in the final regression results.

3.6.4 Endogeneity Problem

When standard OLS is used to estimate the simultaneous equations model, there is a likelihood that the dependent variables are endogenous to the error term ε_{ij} thus creating the problem of endogeneity. An endogeneity variable is a type that violates the OLS assumption, leading to the existence of a correlation between the error term, omitted

variables and the dependent variables, thereby causing inconsistency and resulting in biases of the estimated parameters. In any econometric estimation method employed, attention is given to endogeneity issues that may arise mainly when the explanatory (exogenous) variables x may be jointly correlated with dependent (endogenous) variables y and uncorrelated with error term ε (Bowden & Turkington, 1984).

The naïve approach to partly address the endogeneity problem in all the regressions is to lag all variables by 1 year (Wooldridge, 2003). However, the logarithm transformation of some of the policy variables such as political instability and corruption index; some geographical variables, exchange rate, infant mortality rate and aid were not taken in order not to lose the zero values. Therefore, a different approach is utilized to tackle endogeneity in all the four models specified to examine objective one, two and three. For objective one, a dynamic panel model approach known as the Least Squares Dummy Variable Dynamic Panel Estimator (Bruno, 2005) is used and the details are stated in subsection 3.6.6. In objective two, instrumental variables Two-Stage Least Squares estimator is employed, the decision is based on Biggeri and Sanfilippo (2009), Reed (2015) and Selaya and Sunesen (2012) studies. The last objective on the determinants of aid model's likely endogeneity problem that may arise is circumvent using Pesaran Dynamic Fixed Effects panel estimator (Blackburne & Frank, 2007) stated in detail in sub-section 3.6.8.

3.6.5 Generalised Least Squares

The pooled ordinary least squares (OLS) with white correction for heteroskedasticity or serial correlation (Büthe & Milner, 2008)is used as references for the reported results since it is helpful in summarising the partial relationships in the data. However, pooled OLS estimator suffers a lot of limitations because country fixed effects are not observed, and the correlation between country fixed effects and lagged dependent variable (γ_{it-1})

results in inconsistent coefficient and biased estimates. Therefore, the generalised least squares (GLS) estimator is the efficient alternative approach to estimate parameters, a linear regression model when the observations have unequal variance (Kantar, 2015). Also, the GLS estimator is easy to compute, adjusting for group-wise heteroskedasticity or autocorrelation; it provides stronger results in terms of the root mean squared error (RMSE) (Bruno, 2005), almost unbiased estimates of the model error and then allows for both fixed effects and random effects (Orsini, Bellocco, & Greenland, 2006) in the cross-section**.**

Most existing empirical studies on developing African countries' trade, FDI and their aid relations with other regions utilise two estimation techniques; pooled OLS (De Grauwe et al., 2012; Edwards & Jenkins, 2014; Kolstad & Wiig, 2011; Kolstad & Wiig, 2012; Younas & Bandyopadhyay, 2007) and GLS, RE and FE (Anwar & Nguyen, 2011; Arvanitis, 2005; Büthe & Milner, 2008). Importantly, the choice of GLS as the appropriate estimation technique is due to the reported Lagrange Multiplier (LM) statistic test values that are statistically significant at 1per cent level. This test shows that the GLS estimator is valid.

3.6.6 Least Square Dummy Variable Dynamic Panel Estimator

Dynamic relationships modelling in empirical economics is an important issue where unobserved heterogeneity in country-specific behaviour and characteristics need to be estimated. Therefore, an instrumental variable is required to accommodate the dynamics and unobserved country heterogeneity in the phenomena of interest (Bruno, 2005). Nickell (1981) reveals that for autoregressive panel data models, the Least Squares Dummy Variable estimator (LSDV) is unreliable for finite T and bias in the context of dynamic estimation. As a substitute to LSDV, Anderson - Hsiao (*ah*) (1981, 1982) use instrumental variables (IV) to transform the model in first differences to eliminate the

unobserved country heterogeneity, use the second lags of the dependent variable, either at difference or in levels as an instrument for the differenced one-time lagged dependent variable (Bruno, 2005). Arellano - Bond (*ab*) (1991) developed a generalised method of moments (GMM) estimators that are more accurate than *ah* for the first difference model that relies on a higher number of internal instruments. Thus, Blundell and Bond (*bb*) system corrector, proposed estimator is efficient, unbiased and outperforms first difference of IV and GMM estimators regarding having the smallest RMSE (Blundell & Bond, 1998). However, the traditional IV and various GMM estimators suffer small sample bias due to weak instruments problem (Armey & McNab, 2018; Hayakawa & Pesaran, 2015).

To this end, the Monte Carlo experiment carried out by Judson and Owen (1999), to evaluate the performance of traditional IV and the GMM estimators that was initially developed by Anderson - Hsiao (1981, 1982) (*ah*), Arellano and Bond (1991) (*ab*), Blundell and Bond (1998) (*bb*) and others. The results reveal that the solution proposed for IV-GMM is bias, unprecise, unsuitable for unbalanced panel data, and not consistent with small N and infinite T. Although, the least-squares dummy variable (LSDV) estimator performs better than both the IV and GMM in terms of having a fairly small variance. Nevertheless, LSDV estimator is bias, negative and increases in absolute value from extreme unbalance to slight unbalance for specified sample size (Bruno, 2005). As an alternative approach for the bias approximation formulas for the LSDV estimator, Bruno (2005) extends the results of Kiviet (1995) and Kiviet, Phillips, and Schipp (1999), with strictly exogenous selection rule to accommodate for unbalanced panels, and assess how unbalance panel affects the LSDV bias and the bias approximations of various orders. The result confirms that the corrected bias approximations of LSDVC estimators for a standard autoregressive panel data model in small samples of 10, 20 and 40 units perform better against IV-GMM and LSDV estimators regarding RMSE and bias.

Inferring from the above, to analyse the dynamic relationships between the dependent variable (China's imports) and other explanatory variables in our gravity trade model in objective one, an LSDVC bias corrector is used to deal with biases that arise as a result of heterogeneity and endogeneity in the panel dataset resulting from country-specific behaviour and characteristics of small N and T that are not observed in the cross-sectional units, as well as the non-zero correlation. Likewise, the estimation technique is appropriate to solve for endogeneity problem that occurs due to the correlation between regressor and dependent variables in the FE. However, LSDVC estimator breaks down quite often due to the limitations of strict exogeneity, white noise disturbances and analytical standard errors, hence, the variance-covariance matrix bootstrap (200 iteration) is included to provide an accurate approximation based on first-order asymptotic theory as a solution (Horowitz, 2001).

3.6.7 Generalised Two-Staged Least Squares

Estimating the complicated relationship between dependent variables (Chinese FDI stocks and flows) and 'predetermined' correlated explanatory (exogenous) variables such as GDP per capita and GDP in the FDI models (equation 3.5 and 3.6) requires a technique that will solve the problem of endogeneity and the possible simultaneity in the cross-sectional panel data and give feedback on the effects. To this end, the natural logarithm of the dependent variables and the explanatory variables of the linear regression models are taken to mitigate against endogeneity problems or any other unobserved heterogeneity that may result into omitted variable bias.

However, the natural logarithm approach is too naïve an approach to tackle the possibility of endogeneity (Neumayer & Spess, 2005). Therefore, instrument variable (IV) is created to replace the problem variables that correlate with the endogenous explanatory variables and an explanatory error term, conditional on the other covariates

(Reed, 2015). In specific, instrumental variable method Two-Stage Least Squares (2SLS) estimator is adapted to resolve the endogeneity problem more comprehensively. The rationale behind the choice of the estimator is due to the sample size issue, in which the Monte Carlo study supported the 2SLS procedure as the feasible alternative to always yield a unique set of parameter values for a given instrument list. As an empirical matter and to confirm the instrument's validity, the standard Sargan-Hansen tests for endogeneity and over-identifying restrictions measurement error is carried out and it shows that the IV is uncorrelated with the error term (ε) or any other unobserved factors influencing the exogenous variables (Hayashi, 2000). Failure to reject the null hypotheses of both tests supports the validity of the model. Also, the Pegan-Hall general test statistic is carried out to confirm the IV heteroskedasticity test(s) using levels and cross products of all IVs, in which the null hypothesis (H_0:) states that 'Disturbance is homoscedastic' is rejected to show the nonexistence of heteroscedasticity in the results of the regressions. The last statistic test carried out is the Test of endogeneity of the IV used, and the null hypothesis (H_0:) states that 'Regressors are exogenous' is accepted to indicate that the IVs are exogenous so long as the Durbin-Wu-Hausman chi-sq test is significant. The statistical tests are carried out so show that the instrument 2SLS is a robust and valid estimator for analyzing the FDI models.

3.6.8 Pesaran Dynamic Fixed Effects

To determine the long-run and the short-run relationship between Chinese loans and other exploratory variables in equations (3.7) and (3.8). The estimation of the correlation coefficient of panel data of 18 oil/minerals exporting countries from 2000 to 2015 requires dynamic heterogeneous panel unit root test and the application of panel cointegration tests, apart from the FE estimation and GLS estimation results reported. It is important since both FE and GLS give a bias and inconsistent estimate in the cross-section because of the lagged regressor γ_{it-1} that correlates with the error term ε. Also, the power of the

individual unit root tests can be severely distorted due to small sample size, which is the case with the data used (Pesaran, 2006, 2007). In addition, the heterogeneous panel data makes the POLS and FE estimators bias and inconsistent with large sample data size.

To resolve this issue, the nonstationary heterogeneous panels as proposed by Blackburne and Frank (2007) provide three alternative estimators which include the dynamic traditional fixed effects estimator (that depend on pooled cross-sections) in which all parameters across the panel are controlled to be equal except the intercepts. The Pesaran and Smith pooled mean-group dynamic long-run relationships estimator from heterogeneous panels which relax the restriction on short-run coefficient and depends on estimating N time-series regressions and averaging the coefficients (Pesaran & Smith, 1995). Also, the Pesaran et al. (1999) dynamic long-run relationships that are used to estimate both large T and N, and depends on both pooled and an average of the coefficients. It is worth mentioning that the coefficient of each factor may vary across the panel due to the uniqueness of the operation of the individual country. This uniqueness contains some theoretical information that is very crucial for a nation's policy formulation and implementation. Specifically, Stata statistical software is used to implement the estimator that is stated as *xtpmg* command with the dynamic fixed effects framework that fits equation (3.7 and 3.8) the China's aid models (Blackburne & Frank, 2007).

3.7 Summary

This chapter gave justifications for the selected sample, the data used, model specification, variables selection and description, and estimation techniques used in answering the research questions in the thesis. Also, several estimation techniques such as OLS, FE, RE, GLS, 2SLS, PPML, LSDVC and PMG which were used to analyse each of the specified models are explained. The decision to use different methods is due to the peculiarity of the dataset and the advantages of each method. Therefore, model

specifications with all necessary adjustments that will be used to establish the effects between variables were adequately discussed. Furthermore, the validity and suitability of the estimation techniques were confirmed through some post-estimation statistic tests. Subsequently, the next chapters provide the empirical results and discussions of the findings.

CHAPTER 4: THE DETERMINANTS OF CHINA'S BILATERAL IMPORTS WITH OIL AND MINERALS EXPORTING AFRICAN COUNTRIES

4.1 Introduction

This chapter presents the empirical findings on the determinants of bilateral sector-specific imports between China and 18 oil and minerals exporting countries in Africa. The analysis of the bilateral sector-specific imports is based on the 4-or 6-digit code of disaggregate imports that is classified into oil/minerals, manufacturing and agricultural products to achieve the study objective. Also, the discussion of the econometric estimation, interpretation of results and implications of the findings of the study are presented. The main notion for classifying the disaggregate imports is a gauge to identify the sector(s) that is sustaining bilateral imports between China and 18 oil/minerals exporting African countries. Lastly, the last section gives a summary of the chapter.

4.2 Evolving Trade Patterns

The trade volume between China and Africa recorded considerable growth from the 1990s (Oyejide et al., 2009). The pace of growth reflects the increase in demand for African natural resources, a pattern like that of Africa's traditional trading partners (Kolstad & Wiig, 2011). Likewise, China emerged as the third-largest African trade partner, after the US and some EU countries (Haugen, 2011; Renard, 2011). In terms of trade volume, China remains Africa's largest trading partner both in exports and imports, while the US and EU remain African's export destinations (Edwards & Jenkins, 2014). Except for South Africa whose industries are well developed, other top China trading partners in Africa like Nigeria, Angola, Egypt, Algeria, Libya, Congo, Ghana, Sudan, and Zambia are minerals exporters. Also, from Table 4.1, China's imports from Africa are less than its exports to the continent. These patterns of engagement as shown in Table 4.1 reflect the focus of concern of this research.

Table 4.1: China's Trade Volume with Africa 1992-2015 (thousand US$)

Country	1992	1998	2004	2011	2014	2015	**Exports 1992-2015**	**Imports 1992-2015**	**Total Trade**
Algeria	3003	11691	123959	643276	870992	838202	5193005	1380814	6573819
Libya	17642	8972	67174	278395	288400	284531	1873187	2755082	4628269
Cameroon	2563	6755	24892	153705	256630	261968	947959	616587	1564547
Congo, Rep.	632	8809	166209	516172	646354	365666	632460	4295875	4928336
Angola	3788	19035	491085	2770633	3708132	1972041	3096373	24016365	27112738
Cote d'Ivoire	3038	17605	23146	70273	143607	170178	913931	167594	1081525
Egypt, Arab Rep.	17564	60643	157637	880157	1161983	1287861	8080325	1032775	9113101
Ethiopia	0	6874	20844	117742	341221	382570	1670396	269253	1939649
Gabon	4976	15731	41444	84789	203789	176830	300941	1332369	1633311
Ghana	2926	12006	59078	347313	543197	644870	3048172	574143	3622316
Mauritania	1478	1075	11473	190331	192752	154895	440124	1055497	1495622
Nigeria	9695	38496	218177	1078925	1805191	1495309	9526165	1360329	10886495
Chad	148	15	22852	36012	42605	21594	173591	215795	389386
Tunisia	5189	12976	27922	133218	144596	142456	1102732	174106	1276839
South Africa	0	0	591210	4545749	6027112	4610486	12927098	25518511	38445610
Zambia	2161	2838	22214	339327	379701	236826	467826	1914503	2382330
Congo, Dem. Rep.	1337	6324	13657	398867	417778	407512	698602	2131266	2829868
Equatorial Guinea	8	6890	99664	167294	321719	116536	280912	177227	2290378

Source: UN-Comtrade (2016).

Moreover, as shown in Figure 4.1, during the global financial crisis the trade intensity increases, and China became a major economic player in Africa with total trade of 2.21 per cent in 1995-1999 to over 20.8 per cent in 2015.

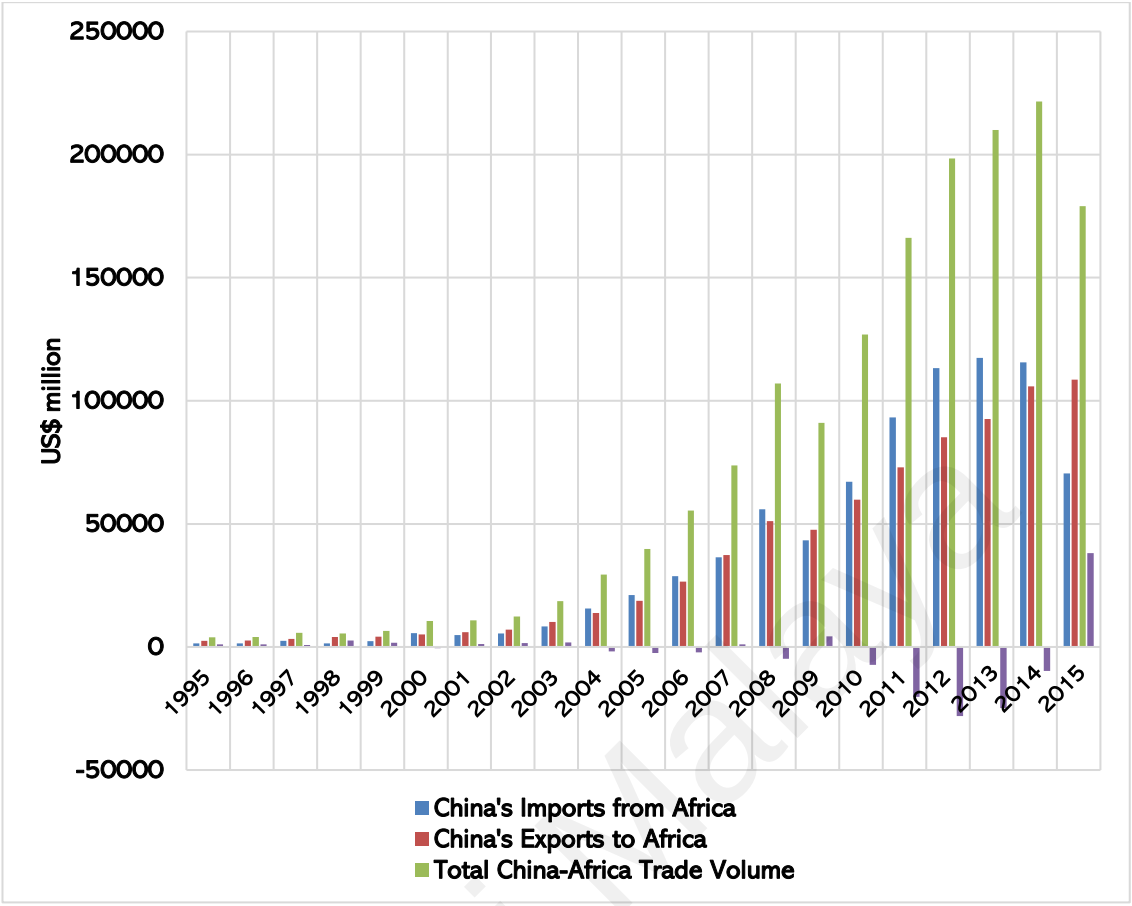

Figure 4.1: China-Africa Trade Balance and Volume (1995-2015)

Source: Author's computation from Tralac (2018).

Likewise, the value of the Chinese exports and imports to Africa from 1995-2015 is 48.51 per cent and 51.49 per cent respectively; and, it is projected to increase in 2017. The period from 1995-2003 coincides with when China renews its economic engagement with the continent, and Africans traded more with their traditional partners. Subsequently, Sino-Africa trade becomes established in 2004 as evident from the table and figure above. Between 2014 to 2015, China's imports from Africa declined from $115.7bn to $70.4bn mainly due to falling crude oil prices. Another decline is attributed to the fall in the imports of "commodities not specified" as stated in UN-Comtrade HS4 nomenclature. Within this period, the decline in oil exports accounts for about 50 per cent of the decline, while the commodity prices dropped because of the global economic meltdown. This is an indication that oil is one of the Chinese main imports from Africa.

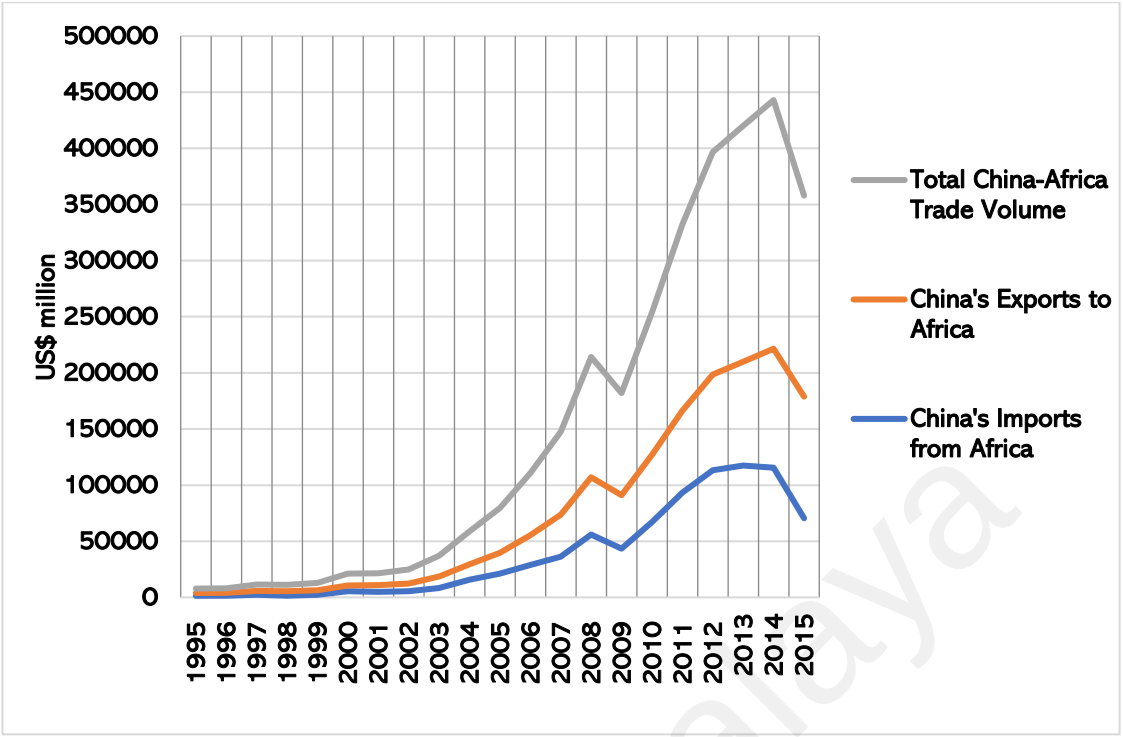

Figure 4.2: China-Africa Imports and Exports Trade Volume (1995-2015)

Source: Author's Computation from Tralac (2018).

Thus, from Figure 4.2, China's imports from Africa represent 30 per cent, while its exports to Africa represents 70 per cent of the total trade volume. Accordingly, De Grauwe et al. (2012) and Kaplinsky and Morris (2009) added in this regard that trade interaction of Africa with China led to increase in the economic growth of the former through an increase in total African exports.

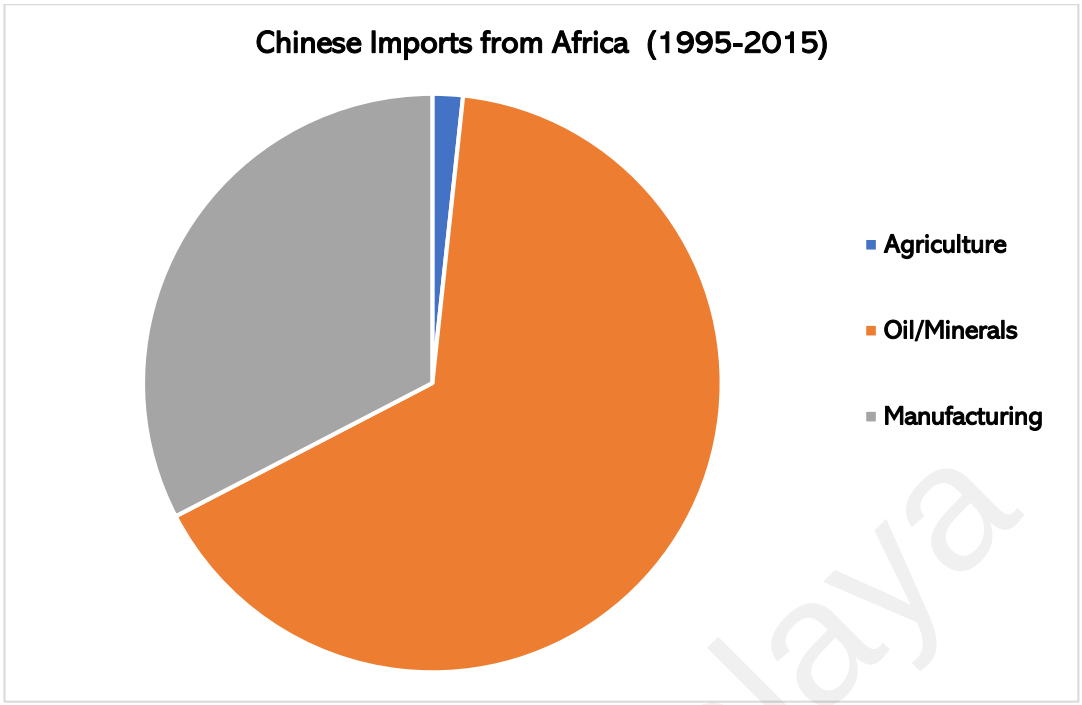

Figure 4.3a: China's Imports from Africa, by Product Groups

Source: Author's computation from Tralac (2018).

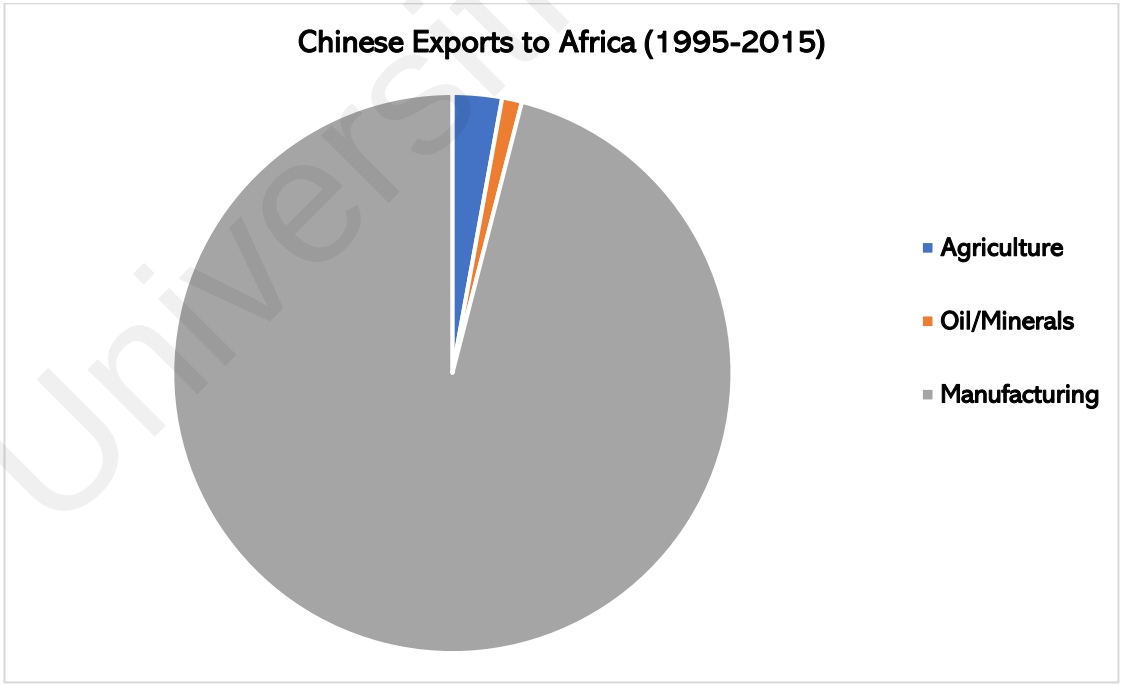

Figure 4.3b: China's Exports to Africa, by Product Groups

Source: Author's computation from Tralac (2018).

About 66 per cent of China's imports from Africa are oil/minerals (Renard, 2011), mainly from Angola, South Africa, Sudan, Congo Republic and Nigeria, and these countries record trade surpluses with China. In contrast, China exhibits a comparative advantage over Africa and exports high and medium-cost manufacturing goods like plastic products, footwear, clothing and textiles, machinery and transportation to Africa (Edwards & Jenkins, 2014; Eisenman, 2012; Kaplinsky & Morris, 2009; Kolstad & Wiig, 2011; Muhammad et al., 2018; Muhammad et al., 2017; Zafar, 2007). These categories of manufacturing products account for 96 per cent of China's total exports to Africa, and agriculture and oil/minerals exports to Africa represents only 3 per cent and 1 per cent, respectively. In all, African agricultural products represent only 2 per cent of their exports to China, despite African comparative advantage over China in agriculture. Manufacturing products such as clothing and textiles, base metals, precious stones/metals, and others represent about 33 per cent of China's imports from African countries (Kolstad & Wiig, 2011).

4.3 Estimation of the Gravity Model of Trade

The overall methodology of the study is presented in chapter three. The estimation of the results and discussion related to the objective is discussed here. For efficient results, three other econometric techniques, GLS, PPML and LSDVC (apart from pooled OLS[20] and fixed effects (FE) regression) were used to estimate the model and to test the established relationships between the dependent variable (imports) and independent variables. Also, diagnostic statistic tests were carried out to confirm the validity and robustness of the regression specifications in the import's equation (3.4) that is presented in Tables 4.2. and 4.3. Thus, applying unit root test and panel cointegration tests for

[20] The pooled OLS estimation method is inconsistent, nevertheless, the results are used in summarizing the partial correlations in the data and as references to the main estimators.

unbalance panel of less than 30-period sample can create computational problems (Pedroni, 2001). Furthermore, based on the assumption of Moon and Philips (1999), cross-sectional dependency test could not be applied since using dynamic model approach creates independence in the errors across cross-sections.

In Table 4.2, the estimated coefficient of the pooled OLS and FE regression results have all the expected signs, except for political instability ($POLSTAB_{ijt}$) and distance ($InDistw_{ijt}$) variables. A comparison of the results in Table 4.2 with that of Table 4.3 shows that the estimated results are qualitatively similar with little variation. However, discussing the diagnostic tests is imperative before concluding that the results are free from biases and are valid.

In the first instance, to determine whether there is the possibility of autocorrelation among the error terms and whether there is the problem of heteroskedasticity and multicollinearity in the cross-section of the pooled OLS regression, this study uses the Breusch-Pagan/Cook-Weisberg test for heteroskedasticity, Wooldridge test for autocorrelation in panel data and variance inflation test for multicollinearity. The results of both the Breusch-Pagan/Cook-Weisberg test for heteroskedasticity and Wooldridge test for autocorrelation in panel regression show that the null hypotheses should be rejected. This indicates the presence of both heteroskedasticity and serial correlation issues in the pooled OLS regression results while the result of variance inflation factors (VIF) that is used for testing multicollinearity in the estimated results show that the null hypothesis could not be rejected as the VIF mean for all the variables is 5.98. The accepted threshold for VIF as stated by Kutner, Nachtsheim, and Neter (2004); Neter, Kutner, Nachtsheim, and Wasserman (1996), must not be greater than 10 (< 10), hence, the estimated results are free of multicollinearity problem. This led to the use of FE regression in which the choice was determined by the Hausman statistic test for random effects (RE)

and FE, and the results show that the null hypothesis could not be rejected because the difference in coefficients is not systematic. As expected, the FE regression results omitted the time-invariant[21] variables like distance ($lnDistw_{ijt}$), landlock ($LLOCK_{ijt}$) and land area ($lnLAREA_{ijt}$) because of collinearity issue. Likewise, the results of the modified Wald test for group-wise heteroskedasticity in the fixed effects regression model and Wooldridge test for autocorrelation in panel data rejected the null hypothesis, indicating the presence of heteroskedasticity and first-order autocorrelation in the results. To resolve these issues of heteroskedasticity and first-order autocorrelation, the GLS estimator with country-specific effect and LSDVC estimator were used. Another important issue that needs to be resolved is zero values that are associated with Sub-Saharan African countries trade data (He, 2013), in which the PPML technique that the gravity model supports are used to account for this zero-trade value.

The empirical analysis of the trade equation (3.4) presented in Table 4.3 shows that the GLS, LSDVC and PPML are the appropriate estimation technique for answering the research question. Inferring from the robustness check of the estimated coefficient of the lagged of import having the expected sign and it is statistically significant at 1 per cent level under LSDVC, it indicates that the coefficients representing the adjustment play an important role and buttresses the stand that the model of import using gravity methodology can be considered dynamically.

[21] The variables $lnDistw_{ijt}$, $LLOCK_{ijt}$ and $lnLAREA_{ijt}$ are time-invariant over the estimation sample in the LSDVC dynamic regression bias correction estimator and has been discarded.

4.3.1 Results Interpretations and Discussion on the Estimated Gravity Model of Trade

The PPML estimation results R^2 value is 0.996, which is quite high and almost similar in comparison with R^2 value 0.871 for the pooled OLS and R^2 value 0.844 for the fixed effects specification. Besides, the GLS Log-likelihood value is -89.113, Wald Chi^2: 440504.42, p = 0.000 (which means null hypothesis must be rejected at 1 per cent significant level) and PPML estimation have the highest Log-likelihood value of -6.239. Hence, the results confirm that both GLS and PPML are appropriate for the estimation and that individual effects of African oil and minerals exporting countries are strong.

For interpretation purpose, the dynamic LSDVC estimation results were explained together with the GLS and PPML results. Based on the results, the estimated coefficient of the lagged GDP_i which serve as a proxy for the market size of China is 1.979 and it is found to be positive and statistically significant at 1 per cent in the GLS model. Also, in the PPML model, the GDP_i estimated coefficient is 0.004 and significant at 1 per cent level, though, insignificant for dynamic LSDVC model. The GDP_j (Africa) positive estimated coefficient is 1.636 and significant at 1 per cent level under GLS; 5 per cent level under PPML with an estimated coefficient of 1.442 and, 10 per cent level under the dynamic LSDVC model with an estimated coefficient of 1.387. The positive and significant level of GDP is not contrary to theoretical expectation. As GDP_i indicates the importers capacity to import more goods, while GDP_j measures productive capacity and can be used to indicate the range of products available for exports. As expected, the African oil/minerals exporting countries under study tend to export more to China, due to the oil and minerals dominant in the region. The significantly positive results align with the expected results of gravity models, and with the findings of Anwar and Nguyen (2011), Biggeri and Sanfilippo (2009) and De Grauwe et al. (2012).

Table 4.2: Regression Results of Imports between China and Oil/Minerals Exporting Countries in Africa Using Pool OLS and Fixed Effects (1992-2015)

Variables	Coefficients (Pooled OLS)	*p*-value	Coefficients (Fixed effects)	*p*-value
$lnAGRICShr_{ij}$	0.020	0.420	0.076**	0.017
	(0.81)		(2.41)	
$lnOILShr_{ij}$	0.239***	0.000	0.203***	0.000
	(9.49)		(9.75)	
$lnMANUShr_{ij}$	0.280***	0.000	0.132***	0.000
	(10.00)		(3.96)	
$lnGDP_i$	1.649**	0.021	1.979***	0.005
	(2.33)		(2.84)	
$lnPOP_i$	0.014	0.958	0.169	0.371
	(0.05)		(0.90	
$InDistw_{ij}$	2.170***	0.000		
	(4.55)			
$LLOCK_{ij}$	-0.838***	0.000		
	(-4.23)			
$lnGDP_j$	-0.112	0.269	1.637***	0.000
	(-1.11)		(4.15)	
$ln\ POP_j$	-0.240**	0.017	-6.712***	0.000
	(-2.41)		(-3.68)	
EXR_j	-0.002***	0.000	0.001	0.158
	(-4.38)		(1.42)	
$lnOPENSS_{ij}$	1.256*	0.074	0.857*	0.082
	(1.80)		(1.75)	
$lnLAREA_{ij}$	0.880***	0.000		
	(9.36)			
$Corrpt_{ij}$	-0.395**	0.018	-0.423*	0.093
	(-2.39)		(-1.69)	
$POLSTAB_{ij}$	0.154	0.170	-0.036	0.763
	(1.38)		(-0.30)	
Constant	-67.663***	0.005	24.331	0.244
	(-2.87)		(1.17)	
R-squared	0.871		0.844	
Adjusted R-squared	0.859			
Number of observations	175		175	

Note: All estimations are carried out with Stata 12 software. The coefficients and the *t*-values for all the variables are given in parentheses. Asterisk *, ** and, *** denotes level of significance at 10%, 5% and 1% respectively. Also, the detail results of the robustness check are presented as an appendix.

Table 4.3: Regression Results of Imports between China and Oil/Minerals Exporting Countries in Africa Using GLS, PPML and LSDVC (1992-2015)

Variables	Coefficients (GLS)	*p*-value	Coefficients (PPML)	*p*-value	Coefficients (LSDVC)	*p*-value
L1.					0.282***	0.000
					(4.04)	
$lnAGRICShr_{ij}$	0.075***	0.008	0.022	0.285	0.069	0.129
	(2.64)		(1.07)		(1.52)	
$lnOILShr_{ij}$	0.203***	0.000	0.203***	0.008	0.186***	0.001
	(10.67)		(2.67)		(3.23)	
$lnMANUShr_{ij}$	0.132***	0.000	0.117***	0.000	0.123**	0.047
	(4.34)		(4.02)		(1.99)	
$lnGDP_i$	1.979***	0.002	0.004***	0.000	1.613	0.150
	(3.11)		(8.17)		(1.44)	
$lnPOP_i$	0.169	0.326	0.122	0.332	-0.039	0.887
	(0.98)		(0.97)		(-0.14)	
$InDistw_{ij}$	-4.922**	0.017	-3.417***	0.000		
	(-2.39)		(-3.92)			
$LLOCK_{ij}$	-3.196**	0.015	-4.073***	0.000		
	(-2.43)		(-3.69)			
$lnGDP_j$	1.636***	0.000	1.442**	0.017	1.387*	0.090
	(4.54)		(2.38)		(1.69)	
$ln\,POP_j$	-6.712***	0.000	-9.401***	0.000	-6.052*	0.066
	(-4.03)		(-4.55)		(-1.84)	
EXR_j	0.001	0.120	0.000	0.874	0.001	0.793
	(1.55)		(0.16)		(0.26)	
$lnOPENSS_{ij}$	0.857*	0.055	-0.002	0.752	0.705	0.294
	(1.92)		(-0.32)		(1.05)	
$lnLAREA_{ij}$	5.331***	0.000	9.794***	0.000		
	(4.37)		(4.68)			
$Corrpt_{ij}$	-0.423*	0.064	-0.146	0.488	-0.323	0.482
	(-1.85)		(-0.69)		(-0.70)	
$POLSTAB_{ij}$	-0.035	0.740	0.059	0.633	0.049	0.783
	(-0.33)		(0.48)		(0.27)	
Constant			4.939	0.557		
			(0.59)			
Log-likelihood	-89.113		-6.239			
R-squared			0.996			
Wald chi^2 (Prob > chi^2)	440504.42					
	(0.000)					
Number of observations	175		175			

Note: All estimations are carried out with Stata 12 software. The coefficients and the *z*-values for all variables are given in parentheses. Asterisk *, ** and, *** denotes level of significance at 10%, 5% and 1% respectively.

The size of the local economy, which is proxy as population ($lnPOP_i$) is not significant for China in all the three models and has a negative estimated coefficient of -0.039 in the dynamic LSDVC model. The reason is that population growth increases the size of local markets, inspire division of labour and specialization which leads to more output, more employment opportunities, more investment, and larger economies of scale that make the production of goods available at a lower cost which invariably reduces exports due to more internal demand for the resources. While for Africa ($ln\,POP_j$), the estimated

coefficient is negative in all the three models. But significant at 1 per cent level with a coefficient of -6.712 in the GLS model; 1 per cent level of significance with -9.401 estimated coefficients in the PPML model and 10 per cent significant level with an estimated coefficient of -6.052 in the dynamic LSDVC model. This implies that if African oil/minerals endowed countries decrease in population by 1 per cent, then, imports from China's decreases by the 9.401 per cent under the PPML results and by over 6 per cent in the GLS and LSDVC regressions results. Given that the model controls for GDP, then, the population variable is inversely related to GDP per capita and the countries with lower per capita tend to trade less. This result is consistent with the literature of Blomqvist (1994), Johnston et al. (2015), Linnemann (1966) and Mátyás (1997), where the population of trading partners affected trade flow negatively and remained significant.

Distance ($InDistw_{ij}$) which is the proxy for transportation costs is significant with a negative coefficient at the 5 per cent and 1 per cent levels respectively in the GLS and PPML models. However, the dynamic LSDVC omitted distance due to time-invariant nature of the data. This shows that distance had a negative effect on the volume of trade flows between China and Africa. Based on the GLS model, if the distance increases on average by 1 per cent, China's imports reduce by -4.922 per cent. Also, for the PPML model, an increase in distance by 1 per cent will amount to -3.417 per cent fall in imports. Therefore, the farther the distance from one country to the other, the less the volume of trade recorded. Conversely, the closer the distance between trading partners, the more the trade flows. Thus, this finding is in consonance with the classical results of the gravity model of Linnemann (1966) and line with the study of Olofin et al. (2014).

The dummy variable landlock is negatively significant at 5 per cent level, with a coefficient of -3.196 in the GLS model and a 1 per cent significant level with a coefficient of -4.073 in the PPML model. As expected, it conforms with *a prior* expectation and the

findings of Biggeri and Sanfilippo (2009) and De Grauwe et al. (2012). The reason for this is that accessibility to the hinterland of landlocked or remote countries decreases, and transaction costs are consequently higher, thereby hindering effective trading activities and reducing the number of trade transactions (Dollar & Kraay, 2003). Thus, China's imports from Africa show a significant preference for coastal accessibility. As expected from theory, the dummy variable total land area is positive and significant at 1 per cent level in both the GLS model and PPML model, with coefficients of 5.331 and 9.794 respectively. This implies that China imports more from larger countries and having large landmass spurs trade as stated in the study of Ghosh and Yamarik (2004) and Longo and Sekkat (2004).

The nominal exchange rate (EXR_j) variable which is a measure of African's countries price competitiveness does not appear to have any meaningful effect on China's import in the GLS, PPML and dynamic LSDVC models for the whole period under consideration. Surprisingly, exchange rate variable in Table 4.2 under the pooled OLS results confirms Udo and Obiora's (2006) study with a negative coefficient of -0.002 and a significant level of 1 per cent under the pooled OLS results that are not considered but only used as a reference. Indicating that 1 per cent depreciation in the exchange rate will lead to a 0.002 per cent fall in China's imports from Africa.

The trade openness variable in the GLS model conforms to *a prior* expectation with a 10 per cent significantly positive level and coefficient of 0.857. That is, a 1 per cent increase in trade openness will increase trade by 0.86 per cent. It indicates the importance of trade liberalisation policy in enhancing China-Africa trade in general. Also, part of the assumption of the New Trade Theory is that the more open an economy is, the more they move away from trade distortion or protectionist measure and the more they move to economies of scale which tends to reduce the production cost, enhance good quality, with

higher output and more competitiveness. This result conforms with the studies of Bhattacharya et al. (1997); Lipsey (2000) and Morisset (2000). However, trade openness variable in the PPML model results indicates a negative coefficient but not significant. Similarly, in the dynamic LSDVC model, trade openness has no meaning effect whatsoever on imports.

Looking beyond the foremost determinants to examine the likely impacts of institutional quality on China-Africa trade is imperative as Alden (2005, 2012), Alden and Davies (2006), Taylor (2006), Tull (2006) and Zafar (2007) argue that China's interest in Africa is spurred not only by natural resources but also due to Africa's weak institutional structures. However, the conventional hypothesis is that all things being equal, corruption or weak institutional structure deters bilateral relations (Asiedu, 2006; Biggeri & Sanfilippo, 2009; Chipaike & Bischoff, 2018). Also, corruption gives politicians undue access to skew government institutions to their favour and in extreme cases leads to neglect of physical infrastructure (Tanzi & Davoodi, 1998; Van den Berg, 2001). Therefore, in line with the literature, two indices of institutional quality, namely, control of corruption and political stability were incorporated into the models. The corruption variable which measures the degree of nepotism, unwarranted patronage and bribery within the political system coefficient is negative (-0.395) and significant in pooled OLS regression at 5 per cent level and with a negative coefficient (-0.423) and significant at 10 per cent level in the FE model. It remained negative and insignificant in both PPML and dynamic LSDVC models, except in the GLS model that is negatively significant at 10 per cent level with -0.423 coefficients. More importantly, the GLS results indicate that countries with less control of corruption and hence (presumably) more corruption tend to trade more with China. These results are consistent with De Grauwe et al., (2012); Hu and Van Marrewijk (2013); Shan, Lin, Li, and Zeng (2018). On the other hand, the political stability variable is never statistically significant in all the

regression specifications. Although the coefficient of the FE estimation and GLS estimation is negative, yet it does not show any influence that is tangible enough in explaining the variation in China's imports from Africa. However, this does not indicate that political instability may not have any effects, even when the proxy used did not indicate such. Nonetheless, institutional considerations remain essential for African countries to enhance their trade flows (Fosu, 2011; Mehlum, Moene, & Torvik, 2006).

Turning now to the variables of interest, agriculture's ($lnAGRICShr_{ij}$), oil/minerals ($lnOILShr_{ij}$), and manufacturing ($lnMANUShr_{ij}$) as the determinants of China's imports with the oil/minerals exporting countries in Africa. To begin with, the estimated results of pooled OLS and FE in Table 4.2, the share of agriculture is positively significant at 5 per cent level in the FE estimation and insignificant for pooled OLS. Similarly, oil and manufacture have positive coefficients and are statistically significant at 1 per cent levels in both pooled OLS and FE estimation results reported. However, as mentioned earlier, the two estimation methods are useful in summarising the partial correlations in the data. Hence, slight consideration is given to the estimates because they are probably biased and inconsistent. Consequently, in the main findings obtained with GLS, PPML and dynamic LSDVC methods displayed in Table 4.3, the results show that agriculture share variable is positive and statistically significant at 1 per cent level with 0.08 coefficient for the GLS estimator only. With this exception, Africa's agriculture in small magnitude determines Chinese imports positively. To further show that oil/minerals are not the only imports determinant in the African oil-exporting countries. This finding corroborates Renard's (2011), findings which state that African country's agricultural exports represent only 3 per cent of China's agricultural imports from the region while countries like Canada, Australia and Brazil represents China's top agriculture imports destinations.

The two other trade major variables, oil share and manufacturing share are quite stable and have statistically significant estimates in all the three models. In particular, oil/minerals import share variable conforms with *a prior* expectation and is significant at 1 per cent level with positive coefficients of 0.203, 0.203 and 0.186 in the GLS, PPML and dynamic LSDVC results respectively. The magnitude of the GLS and PPML coefficients are visibly higher and similar than the dynamic LSDVC model coefficient which slightly decreases. This indicates that a 1 per cent increase in imports from China leads to 0.203 per cent increase in oil exports. These results are consistent with the findings of Biggeri and Sanfilippo (2009), De Grauwe et al. (2012) and Foad (2011) and it explains the dominance of oil as a major determinant of China's imports from Africa which have a more competitive advantage in resource endowment to conform with factor endowments theory. Also, in the case of manufacturing share, the positive coefficient is 0.132 and significant at 1 per cent level for the GLS estimator; 1 per cent positively significant level with a coefficient of 0.117 for the PPML model and significantly positive 5 per cent level with a coefficient of 0.123 for the dynamic LSDVC model. As expected, the results of the manufacturing variable are not strange, as they explicitly show that most of China's imports are oil and raw materials (semi-finished goods) that are processed in China. Qualitatively, the results of oil share and manufacturing share are almost similar but somehow weaker results are obtained for the coefficients of the manufacturing variable. More importantly, it indicates that not only oil/minerals solely determine China's imports from the region. Further insight can be gained if the kind of manufactured goods being exported to China is examined, this is necessary given that China has a comparative advantage in manufactured goods than Africa (Renard, 2011). Also, the fact that China crowds out Africa's manufacture in machinery and equipment (vehicles and fabricated metal products), and African countries consumed more

manufactured goods from China than they produce or exports (Edwards & Jenkins, 2014; Oyejide et al., 2009).

4.4 Summary

This chapter empirically analyses the determinants of imports flows between China and African oil/minerals exporting countries. Specifically, it focuses on the core imports sector (s) that influence(s) China bilateral trade flow and investigates other economic factors that determine imports of China from Africa. The chapter also examined the role of geographical factors in consolidating the trade relationship between China and Africa, employing the gravity model of trade and panel data econometric approach. Importantly, for meaningful economic interactions, it is necessary that the role of institutional quality in economic engagement be examined. The quality of the institutional structure will enhance meaningful trade between Africa and China.

Specifically, the results of the empirical investigation conducted with the gravity model of trade using OLS, FE, GLS, PPML and LSDVC estimation techniques to answer the research question one of the thesis were presented in this chapter, though, the panel data are unbalanced because of missing data in some of the variables and zero trade values that are associated with sub-Saharan African countries. Hence, the empirical results provided new evidence on the determinants of bilateral sector-specific imports between China and oil-exporting Africa countries whereas earlier literature on the determinants of China-Africa trade has not made this distinction. The estimation results indicate that oil/minerals, manufacturing (semi-finished goods) and agriculture all determine China's economic re-engagement with Africa. Substantially, China's oil/minerals imports have a higher magnitude while manufacturing and agriculture were less important quantitatively. The implication of the results shows evidence supporting endowment theory and comparative advantage theory which states that abundance of oil and mineral resources

in the region leads to the pattern of trade between Africa and China. Also, GDP, the population of Africa, the total land area available in Africa and the degree of openness of the economy spur more trade between China and Africa oil-exporting countries. However, the gravity model analyses show that the geographical distance between China and Africa reduces trade flow; likewise, African countries that are landlocked witness fewer imports. From the estimated results, it can be deduced that the factors that determine China's economic engagement with Africa oil/minerals exporting countries in terms of bilateral imports is similar to most of Africa's trading partners such as USA, UK, Europe and the recent South-South alliance nations (Johnston et al., 2015; Kaplinsky, 2009; Kaplinsky & Morris, 2009; Nayyar, 2010, 2016).

Furthermore, relating the estimated results to the institutional quality put in place by the African countries and how it determines China economic interactions; the estimations show that there is no relationship between China's imports and political instability among the oil/minerals exporting African nations. This does not provide suggestive evidence that China is not trading with politically unstable countries as stated in the qualitative findings of Taylor (2006). In addition to this, the estimated results on the control of corruption show that when control of corruption decreases, the level of China's imports from China increases. That is, it proves that indeed corruption does determine China-Africa trade engagement. Therefore, further improvements in transparency, prudence and corruption reduction are not likely to improve productivity and enhance Africa's export to China. Nevertheless, Africa needs to continue to strengthen its institutional qualities relating to trade, since both better institutional quality and international trade are difficult to separate.

CHAPTER 5: THE DETERMINANTS OF CHINA'S FOREIGN INVESTMENT IN AFRICA'S OIL AND MINERALS EXPORTING COUNTRIES

5.1 Introduction

This chapter analyses the sector specifying imports determinants of Chinese FDI in 18 oil/minerals exporting African countries, which are the major recipients of China's FDI from the year 2000 till date (UNCTAD, 2014). The aim is to examine empirically the determinants of China's FDI on imports share (agriculture, oil/minerals and manufacturing) and other variables such as GDP, per capita GDP, infrastructure, inflation, human capital, the degree of openness and political instability. To achieve this research objective, China's FDI is divided into two dependent variables, namely, bilateral Chinese FDI stocks and bilateral Chinese FDI inflows, in order to examine independently how each of these two variables determine foreign investment in oil/minerals exporting countries in Africa. The chapter ends with a summary.

5.2 Foreign Direct Investment Patterns

Investment role is indispensable; therefore, the African region depends very much on FDI for its acknowledged advantages (Asiedu, 2006; Ayanwale, 2007). According to UNCTAD (2014), most African countries have witnessed the FDI boom. This is evident in the concerted endeavours of several African nations to enhance their business environment via permutation of reforms, resource mobilisation, and improved environment to attract foreign investment and long-term bilateral relationships. One of the characteristics of China's FDI in Africa is its focus in strategically selected sectors that are of importance to China. Chinese firms have enhanced economic growth, invested dollars in billions, and utilised engineering and construction firms from China to develop infrastructure in oil, minerals, gas and other primary resources in Africa (Alabi et al., 2011; Bosshard, 2008; Gold et al., 2019). China's relations with the resources endowed African countries according to Alden (2005), Anderson and Hsiao (1982), Bing and

Ceccoli (2013), Sanfilippo (2010), Taylor (2006) and Tull (2006) may continue to be strengthened as long as there is quest for oil and mineral resources. Unlike the Western investors, which interfere and attach conditionality to its dealings with Africa (Bosshard, 2008), China's strategy in Africa is to access unexploited resources considered not too significant in volume, in politically risky countries or that are in geographically remote areas. The plan entails huge investments in oil/minerals exploration and the provision of ancillary infrastructures like roads, railways, pipelines, power plants and transmission lines.

Although, Chinese FDI data are mostly not very precise and lacking, nonetheless, there is significant variation in private and State-Owned Enterprises (SOE) investment, (Shen, 2015)[22]. Furthermore, Figure 5.1 and Figure 5.2 show that Chinese FDI flows in Africa from 1990-1999 was zero, and China's FDI stock in Africa was zero in 1990-1995, but witnessed a slight increase of 0.06 in 1996, with a further decline to zero from 1997-2002. Also, at the period of the global financial crisis in 2008, Chinese investment in Africa reached its climax of US$5.49billion.

[22] Shen (2015, pp. 6, Figure 2) differentiates the patterns and strategy of Chinese government and private FDI in Sub-Saharan African economy. Ado and Su (2014) critique and foresee a risk in China's pattern of investment in Africa, as it links directly to investor's choice when choosing the actual sector to invest.

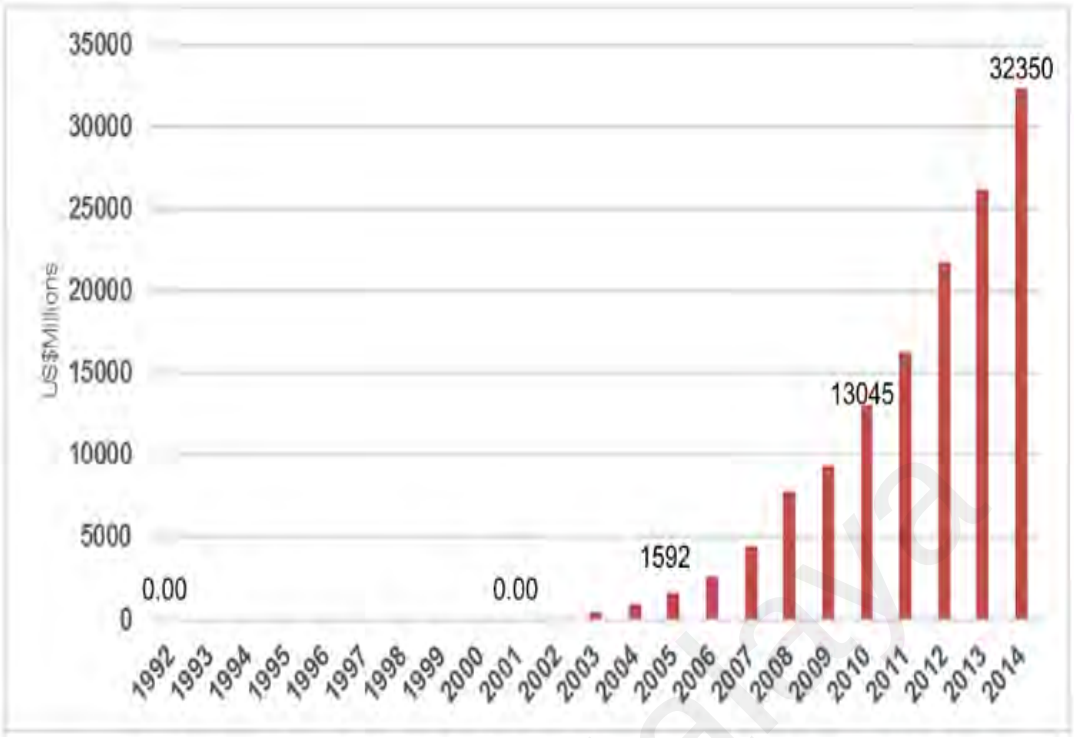

Figure 5.1: China's FDI Stocks to Africa (1992-2014)

Sources: UNCTAD (2014) and Ministry of Commerce (MOFCOM, 2017).

Table 5.1: Values and Shares of China Outward FDI Stocks in 18 oil/minerals Africa Countries (US$ millions)

Country	2001-2005	2006-2010	2011-2014	Total	% Share
Algeria	211.4	2838.6	6313.56	9363.56	10.12%
Angola	8.79	731.89	4494.47	5235.15	5.66%
Cameroon	20.58	139.97	467.28	627.83	0.68%
Chad	2.71	208.24	1028.11	1239.06	1.34%
Congo, Dem. Rep.	40.8	1304.5	4940.18	6285.48	6.80%
Congo, Rep.	18.97	454.77	2331.49	2805.23	3.03%
Cote D'Ivoire	51.26	145.02	174	370.28	0.40%
Egypt, Arab Rep.	68.37	985.17	2030.6	3084.14	3.33%
Ethiopia	42.47	982.43	2719.8	3744.7	4.05%
Equatorial Guinea	35.41	263.44	972.37	1271.22	1.37%
Gabon	90.68	420.4	604.46	1115.54	1.21%
Ghana	20.24	495.02	2666.95	3182.21	3.44%
Libya	34.79	255.86	350.73	641.38	0.69%
Mauritania	6.35	137.19	390.09	533.63	0.58%
Nigeria	201.7	3878.98	7834.56	11915.24	12.88%
Tunisia	4.99	15.85	40.4	61.24	0.07%
South Africa	215.92	10378.45	19189.22	29783.59	32.20%
Zambia	451.76	3136.25	7634.26	11222.27	12.13%
Africa	2986.02	37196.88	96509.87	136692.77	100%

Sources: UNCTAD (2014) and Ministry of Commerce (MOFCOM, 2017).

On the contrary, Kolstad & Wiig, (2011) state that Chinese FDI stock in Africa in 1990 was US$44 million and a further increase of US$1. 2 billion in 2010 to US$ 1.9 billion in 2012.

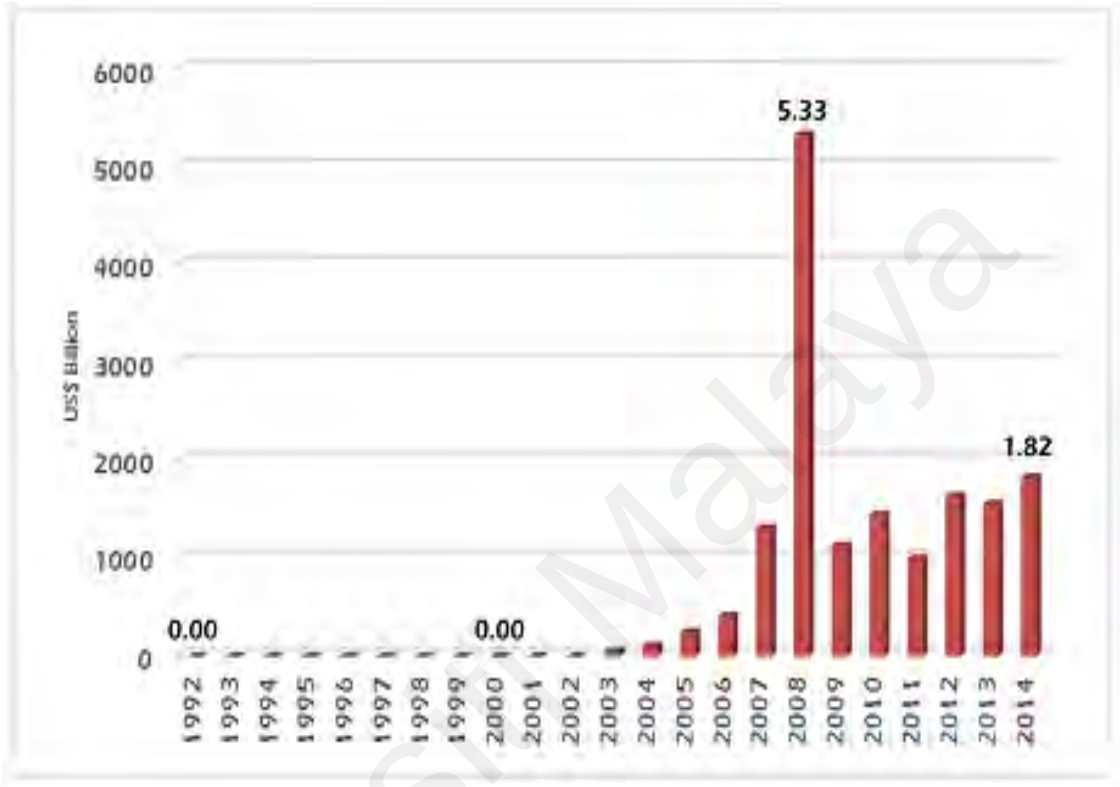

Figure 5.2: China FDI Outflow to Africa (1992-2014)

Sources: UNCTAD (2014) and Ministry of Commerce (MOFCOM, 2017).

Table 5.2: Top China FDI Outflows in Africa (US$ millions)

Region/Country	2003-2006	2007-2010	2011-2014	Total 2003-2014	Share % Total
Algeria	197.48	602.93	1217.23	2017.64	0.13
Angola	22.39	141.04	240.28	403.71	0.03
Congo, Dem. Rep.	53.71	544.61	698.18	1296.5	0.09
Congo, Rep.	21.86	74.74	454.15	550.75	0.04
Egypt, Arab Rep.	29.98	225.06	371.95	626.99	0.04
Ethiopia	29.86	155.81	415.91	601.58	0.04
Ghana	5.96	118.17	443.97	568.1	0.04
Nigeria	191.01	909.66	939.37	2040.04	0.14
South Africa	114.88	5715.03	-876.18	4953.73	0.33
Zambia	105.29	520.16	1301.04	1926.49	0.13
Africa	1303.75	10615.73	12262.36	24181.84	100.00%

Source: Author's compilation from UNCTAD (2014) and Ministry of Commerce (MOFCOM, 2017).

Thus, Tables 5.1 and 5.2 show Africa's top recipient of Chinese investment flows and stock from 2001 to 2014[23]; total flow amount to US$17609. 31 billion, and total stocks are US$ 78 157 billion (UNCTAD, 2014). The Chinese FDI in Africa reveals a significant increase over the period under study.

5.3 Estimation of the FDI Models Panel Data

The overall methodology of the study is presented in chapter three. To estimate the determinants of Chinese FDI to 18 oil/minerals exporting African countries, which concerns the research question two, econometric panel data regression techniques were employed. The decision to use these methods was partially due to the approach of Biggeri and Sanfilippo (2009) and, due to the nature and short duration of bilateral China's FDI data used. For instance, the study used both cross-sectional and time-series data for 18 different countries over a period of 16[24] years, and the sample consists of an unbalanced panel of 288 (1 x 18 x 16) observation, while the duration of the time series data varies across countries. So, given the asymptotic assumptions required for inference, the time series is too short to estimate for each country separately. Hence, the data are pooled, and panel data are considered an appropriate technique. Also, panel analysis is regarded as a suitable technique due to the identified advantages of the ability to tackle heterogeneity of variables over a period; taking into consideration omitted variables and limiting collinearity between the explanatory variables (Baltagi, 2008; Flannery & Hankins, 2013).

[23] The Chinese Ministry of Commerce is yet to release data for 2015, therefore, 2000-2014 data is used.

[24] Although the study period is from 1992 to 2015, however, due to the issues of unavailability of data that is peculiar with studies on sub-Saharan (He, 2013), the analysis of the research question two covers from the year 2000 – 2015 and the justification is provided in chapter 3.

In the empirical specifications, Chinese FDI outflows ($lnChineseFDIflow_{ijt}$) and China's FDI out-stocks ($lnChineseFDIstock_{ijt}$) bilateral data[25] to each of the 18 oil/minerals exporting African countries under study were used as the dependent variables in determining China's attractiveness to Africa in which UNCTAD has the most comprehensive data, and the data trend over time is insignificant. The duration of the series reflects when China's bilateral FDI data conform to OECD and IMF standards (Kolstad & Wiig, 2011). This approach is considered as the best for two reasons, first, since the disaggregate sector specifying China's FDI data by geographical destination is not available, bilateral China-Africa FDI data is considered as the best alternative. Second, Neumayer and Spess (2005) warn that caution should be taken before concluding FDI analysis with outflows and out-stocks as dependent variables except when UNCTAD FDI data are used; only then will the susceptibility of the results be minimised. Based on the two reasons given above, it is worth mentioning that these data capture China's bilateral FDI to Africa in detail than the earlier data employed in studies of Buckley et al. (2007) and Cheung and Qian (2009), which captured approved flows only, thereby leading to likely bias results. Although the studies of Cheung, de Haan, Qian, and Yu (2012), Drogendijk and Blomkvist (2013), Kolstad and Wiig (2011), Kolstad and Wiig (2012) and Qian (2012) used UNCTAD FDI data, however, their data covered from 2003 to 2009 is too short, making it difficult to make a reasonable conclusion on Chinese FDI in Africa. Biggeri and Sanfilippo (2009), used China's FDI oversea stock from China Commerce Yearbook data 1998-2005. The issue with their study is two folds, first, the FDI data used do not conform to the acceptable standard by the IMF and OECD. Second, FDI inflow is not examining only out-stock, thereby, resulting in underestimation of

[25] FDI stocks is calculated yearly, therefore, stocks calculated in two consecutive years may not amount to the foreign investment flow of the subsequent year due to revaluation of the investment stock (Cheng & Ma, 2010).

Chinese FDI. Another explanatory variable included in their regression is the shares of a set of Africa's exports of oil/minerals resources to China, whereas previous studies on China's FDI have focused on natural resources (agricultural produced inclusive) and employed different indices to measure natural resources and therefore arrived at different results. Although, the recent study of Shan, Lin, Li, and Zeng (2018) used UNCTAD FDI data (2008-2014) to examine the role of natural resources, market size and institutions to examine their effectiveness in attracting China's FDI. However, the limitation of their study is the proxy used in measuring natural resource which is reminiscent of Biggeri and Sanfilippo (2009) study.

This study differs by using disaggregated imports-by-products from the UN-Comtrade database that contain the reporting values of cross-importation and exportation by country, products and year (He, 2013) to test for the importance of trade on China's FDI. The structural data composition is based on the UN-Comtrade Harmonized System (HS) 1-99 nomenclature, where, HS 1-24 is agriculture; HS 25-27 are crude oil/minerals while HS 28-99 are manufacturing. The HS classification is employed to measure oil/minerals, agriculture and manufacturing intensity to examine if, African countries exporting oil/minerals are major considerations for China's investments as claimed in the existing studies (Kolstad & Wiig, 2011; Kolstad & Wiig, 2012; Oyejide et al., 2009; Renard, 2011; Taylor, 2006, 2015; Zafar, 2007). Furthermore, because of the short duration of the data, there is a minimal disparity in the included variables in the panel technique to include time dummies. Hence, the econometric results of the sector analyses of Chinese FDI stocks and Chinese FDI outflows to 18 oil/minerals exporting African countries are reported in Table 5.3, Table 5.4, Table 5.5, Table 5.6 and Table 5.7. Specifically, the regression results for the pooled OLS and RE regression are reported in Table 5.3 and Table 5.4. The generalised least squares (GLS) regression results are reported in Table 5.5, and that of the instrumental variable (IV) two-stage least squares (2SLS) and 2SLS

(with robust standard error) regression results are presented in Table 5.6 and 5.7 respectively.

The decision to choose GLS technique as the primary estimator was based on the outcome of the Breusch and Pagan Lagrangian multiplier test for RE which is statistically insignificant in the two FDI models specified. These results indicate that the pooled OLS in which the R^2 values are quite high to signify the strong individual effects of the host countries is more appropriate estimator than RE. However, based on OLS shortcomings of not yielding consistent estimates, diagnostic statistic tests were carried out to determine the possibility of autocorrelation among the error terms, the problem of multicollinearity and heteroskedasticity in the cross-section of the pooled OLS regressions. For autocorrelation, Wooldridge test for autocorrelation in FDI stocks panel data accepted the null hypotheses since it is significant at 0.0034, indicating the presence of serial correlation in the FDI stocks OLS regression results. On the other hand, the Wooldridge test for autocorrelation is rejected and is insignificant at 0.4349 in the FDI flows result; this shows the absence of serial correlation in the FDI flows model. Also, the variance inflation factors (VIF) test for multicollinearity results showed that the null hypothesis could not be rejected with VIF mean of 2.84 and 2.78 for FDI stocks and FDI flows respectively. The accepted threshold for VIF as stated by Kutner et al. (2004) and Neter et al. (1996), is not greater than 10 (< 10), hence, the estimated results are free of a multicollinearity problem. Furthermore, the results of the Breusch-Pagan/Cook-Weisberg test for heteroskedasticity in the FDI flows (0.3895) show no heteroskedasticity issue as the null hypothesis is rejected. Thus, the FDI flows model in the OLS regression results is free from the problems of serial correlation, multicollinearity and heteroskedasticity. A significant value of 0.0719 in the Breusch-Pagan/Cook-Weisberg test for heteroskedasticity carried out for the FDI stock model indicates the presence of

heteroskedasticity issues in the pooled OLS regression results since the null hypothesis cannot be rejected.

The results of the diagnostic test of the pooled OLS results led to the use of RE regression in which the choice was rejected by the Breusch and Pagan Lagrangian multiplier test for random effects. Moreover, Biggeri and Sanfilippo (2009) and He (2013) argued that OLS estimation introduced endogeneity into the regression specification because of the error term ε_{ijt} that correlate with the lagged dependent variable ($M_{i,t-1}$), which gives a biased and inconsistent estimate. Nevertheless, the pooled OLS and RE regression results reported in Table 5.3 and Table 5.4 was used as the initial estimators for the two types of equations (3.5 and 3.6) specified to serve as references. To correct these issues of inconsistency and biases of the results, the GLS estimation technique is used. The GLS log-likelihood value for FDI stocks is -137.4051 and -114.2056 for FDI flows; Wald Chi^2 values are quite high at (215.40) p = 0.0000 for FDI stocks and (97.18) p = 0.000 for FDI flows (which null hypothesis must be rejected at 1% significant level). As expected, GLS estimator gives robust results and is used to correct for heteroskedasticity in the cross-section.

More specifically, to address endogeneity or simultaneity problems that may arise due to the interplay of some explanatory variables with dependent variables in the two FDI models, the natural logarithm (ln) of both the dependents and all explanatory variables in monetary values are taken, except for political instability index and inflation rate. Although it is expected that endogeneity problem is unlikely to matter because Chinese FDI is still relatively small in Africa and since the models do not contain any time-invariant variable that may drop during estimation or affect the models fit. Nonetheless, IV two stages least squares (2SLS) estimation technique proposed by Anderson and Hsiao (1982), is adopted to tackle more adequately endogeneity in the regressions instead of

relying on the naïve belief of using lagged variables to circumvent endogeneity and to achieve efficient and non-biased results. Following Reed (2015); Selaya and Sunesen (2012), GDP and GDP per capita which are the pre-determined contemporaneous variables are lagged and used as instruments with other variables (GDP growth, population, total land area, landlock, common language and colony) that are not in the estimating equations in the 2SLS estimations.

The post-estimation tests of endogeneity in the regressions estimated with instrumental variables (IV) $lnGDP_j$, $lnGDPperk_j$ in 2SLS results from null hypotheses (Ho:) which state that 'Regressors are exogenous' is not rejected since the Durbin-Wu-Hausman chi-sq tests values are: 12.667, $p = 0.001$ for FDI stocks; and 5.412, $p = 0.066$ for FDI flows. The Durbin-Wu-Hausman tests that are significant in both FDI stocks and FDI flow regressions confirm the validity of the instruments and indicate that the OLS estimators of equations 3.5 and 3.6 yield consistent estimates. In other words, any endogeneity among the regressors does not have deleterious effects on OLS estimates. Also, Pagan-Hall general test statistic for heteroskedasticity indicate that (Ho:) the null hypothesis which state that 'Disturbance is homoscedastic' is rejected since the *p*-value is insignificant for FDI stocks ($p = 1.000$) and for FDI flows ($p = 0.999$). The null hypothesis of the Pagan-Hall tests indicates the absence of heteroskedasticity and shows that the mean is equally distributed across the panel. Thus, the Hansen *J*-test of overidentification indicates that the instruments used in the equations of each of the endogenous variables are not overidentified. The overidentification test results which are provided in the appendix show that the instruments used seem valid both theoretically and empirically. In addition, the IV 2SLS regression with robust standard error is performed to robust heteroskedasticity and for overidentifying restrictions since the Wu-Hausman F test: *p*-value for FDI flows ($p = 0.101$) is not significant, although the *p*-value of FDI stocks is significant ($p = 0.003$). The results of the test of significant carried out to examine if all

the independent variables jointly influence the dependent variable chi^2 (10) = 4132.26 and Prob > chi^2 = 0.000 indicates that the model is appropriate. Inferring from the above, GLS estimation is more reliable over both RE and pooled OLS in estimating the FDI models, while the 2SLS is used for consistency check.

5.3.1 Chinese FDI Stocks and Chinese FDI Flows Determinants Results

For interpretation purpose, the GLS estimation results in Table 5.5 were discussed together with the 2SLS and 2SLS-robust standard error results (Table 5.6 and 5.7 respectively). The random effects (RE) regression results reported in Table 5.4 are excluded completely from the discussion, while less attention is placed on the OLS results (Table 5.3) on the basis mentioned in Section 5.3 above.

Table 5.3: Pooled OLS Regression Results for Chinese Bilateral Foreign Direct Investment Stocks and Flows (2000-2015)

Dependent Variables:	Stocks		Flows	
Explanatory Variables	Coefficients (Pooled OLS)	*p*-value	Coefficients (Pooled OLS)	*p*-value
$lnGDP_j$	0.518***	0.005	0.713***	0.001
	(2.88)		(3.51)	
$Infl_j$	0.013	0.643	0.046	0.134
	(0.46)		(1.52)	
$POLSTAB_j$	-0.628**	0.043	-0.641*	0.076
	(-2.06)		(-1.81)	
$lnMANUShr_{ij}$	0.073	0.285	-0.006	0.946
	(1.08)		(-0.07)	
$lnOILShr_{ij}$	0.308***	0.000	0.231**	0.011
	(5.36)		(2.62)	
$lnAGRICShr_{ij}$	0.161**	0.018	0.049	0.524
	(2.41)		(0.64)	
$lnFixPhone_j$	-0.504**	0.017	-0.440*	0.081
	(-2.43)		(-1.78)	
$lnOPENSS_j$	0.168	0.756	1.187	0.129
	(0.31)		(1.54)	
$lnGDPperk_j$	0.023	0.929	-0.165	0.579
	(0.09)		(-0.56)	
$lnSchenrol_j$	3.645**	0.046	4.071**	0.047
	(2.03)		(2.02)	
Constant	-18.535***	0.001	-23.507***	0.001
	(-3.46)		(-3.62)	
Number of Observations	87		70	
R-squared	0.712		0.581	
Adjusted R-squared	0.674		0.510	

Notes: All estimations are carried out with Stata 12 software. The pooled OLS estimated coefficients and *t*-values are in parentheses; all estimates are rounded up to three significant figures *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Table 5.4: Random Effects Regression Results for Chinese Bilateral Foreign Direct Investment Stocks and Flows (2000-2015)

Dependent Variables:	Stocks		Flows	
Explanatory Variables	Coefficients (Random effects)	*p*-value	Coefficients (Random effects)	*p*-value
$lnGDP_j$	0.964***	0.006	0.713***	0.000
	(2.75)		(3.51)	
$Infl_j$	0.010	0.725	0.046	0.128
	(0.35)		(1.52)	
$POLSTAB_j$	-0.397	0.297	-0.641*	0.071
	(-1.04)		(-1.81)	
$lnMANUShr_{ij}$	0.105	0.202	-0.006	0.945
	(1.28)		(-0.07)	
$lnOILShr_{ij}$	0.207***	0.001	0.231***	0.009
	(3.45)		(2.62)	
$lnAGRICShr_{ij}$	0.299***	0.000	0.050	0.521
	(3.50)		(0.64)	
$lnFixPhone_j$	-0.730***	0.009	-0.441*	0.075
	(-2.61)		(-1.78)	
$lnOPENSS_j$	1.028	0.199	1.187	0.123
	(1.29)		(1.54)	
$lnGDPperk_j$	0.460	0.295	-0.166	0.577
	(1.05)		(-0.56)	
$lnSchenrol_j$	5.282*	0.066	4.072**	0.043
	(1.84)		(2.02)	
Constant	-36.564***	0.000	-23.507***	0.000
	(-3.90)		(-3.62)	
Number of Observations	87		70	
R-squared	0.580		0.581	
Wald chi^2 (Prob > chi^2 in parentheses)	106.04		81.91	
	(0.000)		(0.000)	
LM test: X^2	0.3867		1.0000	

Note: All estimations are carried out with Stata 12 software. The random effects coefficients and *z*-values are in parentheses. Wald chi^2 test *p*-values in brackets; Asterisk *, ** and, *** denotes the level of significance at 10%, 5% and 1% respectively. Also, the detail results of the robustness check are presented as an appendix.

Table 5.5: GLS Regression Results for Chinese Bilateral Foreign Direct Investment Stocks and Flows (2000-2015)

Dependent Variables:	Stocks		Flows	
Explanatory Variables	Coefficients (GLS)	*p*-value	Coefficients (GLS)	*p*-value
$lnGDP_j$	0.517***	0.002	0.713***	0.000
	(3.08)		(3.83)	
$Infl_j$	0.012	0.619	0.046*	0.098
	(0.50)		(1.66)	
$POLSTAB_j$	-0.627**	0.028	-0.641**	0.049
	(-2.20)		(-1.97)	
$lnMANUShr_{ij}$	0.073	0.249	-0.006	0.941
	(1.15)		(-0.07)	
$lnOILShr_{ij}$	0.308***	0.000	0.231***	0.004
	(5.74)		(2.85)	
$lnAGRICShr_{ij}$	0.161**	0.010	0.049	0.485
	(2.58)		(0.70)	
$lnFixPhone_j$	-0.503***	0.009	-0.441**	0.053
	(-2.60)		(-1.94)	
$lnOPENSS_j$	0.168	0.739	1.187*	0.093
	(0.33)		(1.68)	
$lnGDPperk_j$	0.022	0.924	-0.165	0.544
	(0.10)		(-0.61)	
$lnSchenrol_j$	3.644**	0.030	4.071**	0.027
	(2.17)		(2.21)	
Constant	-18.535***	0.000	-23.507***	0.000
	(-3.70)		(-3.95)	
Number of Observations	87		70	
Log-Likelihood	-137.405		-114.206	
Wald chi^2 (Prob > chi^2 in parentheses)	215.40		97.18	
	(0.000)		(0.000)	

Notes: All estimations are carried out with Stata 12 software. The estimated coefficients and *z*-statistics for GLS are in parentheses; Wald chi^2 test *p*-values in brackets; all estimates are rounded up to three significant figures *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Table 5.6: Instrumental Variables (2SLS) Regression Results for Chinese Bilateral Foreign Direct Investment Stocks and Flows (2000-2015)

Dependent Variables:	Stocks		Flows	
Explanatory Variables	Coefficients (2SLS)	*p*-value	Coefficients (2SLS)	*p*-value
$lnGDP_j$	0.684***	0.009	1.106***	0.000
	(2.60)		(3.72)	
$lnGDPperk_j$	-1.565**	0.017	-1.377**	0.044
	(-2.38)		(-2.01)	
$Infl_j$	0.048	0.151	0.064*	0.061
	(1.44)		(1.88)	
$POLSTAB_j$	-1.543***	0.001	-1.057**	0.015
	(-3.23)		(-2.43)	
$lnMANUShr_{ij}$	-0.165	0.189	-0.259*	0.100
	(-1.31)		(-1.65)	
$lnOILShr_{ij}$	0.361***	0.000	0.282***	0.004
	(5.26)		(2.89)	
$lnAGRICShr_{ij}$	0.196**	0.012	0.056	0.488
	(2.51)		(0.69)	
$lnFixPhone_j$	-0.172	0.517	-0.311	0.260
	(-0.65)		(-1.13)	
$lnOPENSS_j$	-0.044	0.944	1.179	0.150
	(-0.07)		(1.44)	
$lnSchenrol_j$	1.851	0.399	2.500	0.265
	(0.84)		(1.11)	
Constant	-8.169395	0.266	-21.060***	0.006
	(-1.11)		(-2.78)	
Number of Observations	87		70	
Uncentered R^2	0.9151		0.855	
Durbin-Wu-Hausman	12.667		5.412	
	(0.002)		(0.066)	

Notes: All estimations are carried out with Stata 12 software. The estimated coefficients and *z*-statistics for 2SLS are in parentheses; Hausman tests *p*-values in brackets; all estimates are rounded up to three significant figures *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$. Also, the detail results of the robustness check are presented as an appendix.

Table 5.7: Instrumental Variables (2SLS Robust) Regression Results for Chinese Foreign Direct Investment Stocks and Flows (2000-2015)

Dependent Variables:	Stocks		Flows	
Explanatory Variables	Coefficients (2SLS Robust)	*p*-value	Coefficients (2SLS Robust)	*p*-value
$lnGDP_j$	0.684**	0.012	1.106***	0.000
	(2.51)		(3.97)	
$lnGDPperk_j$	-1.565**	0.021	-1.377**	0.023
	(-2.30)		(-2.28)	
$Infl_j$	0.048	0.163	0.063*	0.059
	(1.40)		(1.89)	
$POLSTAB_j$	-1.543***	0.001	-1.057***	0.008
	(-3.22)		(-2.63)	
$lnMANUShr_{ij}$	-0.165	0.242	-0.259*	0.073
	(-1.17)		(-1.79)	
$lnOILShr_{ij}$	0.361***	0.000	0.282***	0.000
	(5.00)		(4.16)	
$lnAGRICShr_{ij}$	0.196**	0.020	0.057	0.522
	(2.32)		(0.64)	
$lnFixPhone_j$	-0.172	0.409	-0.3112	0.216
	(-0.82)		(-1.24)	
$lnOPENSS_j$	-0.044	0.935	1.179*	0.106
	(-0.08)		(1.62)	
$lnSchenrol_j$	1.851	0.359	2.500	0.249
	(0.92)		(1.15)	
Constant	-8.169395	0.172	-21.060***	0.001
	(-1.36)		(-3.38)	
No. of Observations	87		70	
Uncentered R^2	0.9151		0.855	
Hansen Test	3.337		0.318	

Notes: All estimations are carried out with Stata 12 software. The estimated coefficients and *z*-statistics for robust 2SLS are in parentheses; all estimates are rounded up to three significant figures *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

5.3.2 Discussion on the Empirical Results of the Determinants of Chinese Bilateral FDI Stocks in Africa Oil/Minerals Exporting Countries

The results of both OLS and GLS estimators reported in Table 5.3 and Table 5.5 indicated that all variables are similar across the two specifications, except for the infrastructure variable ($lnFixPhone_j$), where the level of significance differs. Starting with Table 5.3 and Table 5.4, the variables included in the model are oil/minerals $(lnOILShr_{ij})$, agriculture ($lnAGRICShr_{ij}$), manufacturing ($lnMANUShr_{ij}$), GDP ($lnGDP_j$), per capita GDP ($lnGDPperk_j$), human capital ($lnSchenrol_j$), inflation ($Infl_j$), trade openness ($lnOPENSS_j$), fixed-telephone ($lnFixPhone_j$), and political instability ($POLSTAB_j$). As expected, the GLS results in Table 5.5 indicate the

association between FDI stocks ($lnChineseFDIstock_{ij)}$ and oil/minerals imports $(lnOILShr_{ij})$ is positive and significant at 1 per cent level with a coefficient of 0.31, hence, oil/minerals determine FDI stocks. Interestingly, the share of agriculture imports tends to generate some FDI stocks, with a significant 5 per cent and a positive coefficient associated with this variable indicate 0.16 magnitude of FDI from 5 per cent increase in its demand. Whereas, manufacturing imports had a positive coefficient but insignificant impact on FDI. The result is as expected because most of the African countries rely on finished goods from developed countries, especially China whose manufacturing goods have comparative advantage over domestic industries and provide imported cheap goods to poor African countries at the detriment of local industries (Muhammad et al., 2017; Oyejide et al., 2009; Schott, 2008). This result conforms with Edwards and Jenkins (2014) empirical findings on how Chinese manufacturing goods are crowding out South Africa's exports to sub-Saharan Africa. Therefore, China's dominance justifies its economic development status and the comparative advantage it has in the manufacturing sector over Africa whose major export is primary commodities and oil/minerals resources. These empirical findings show that China's FDI in Africa is resource-seeking and confirm the importance of oil/minerals for the development of Africa as it serves as an FDI attraction to their respective economies (Renard, 2011).

The GDP of the host economies which represents the local market size had 1 per cent significantly positive impact on OFDI stocks from China in OLS and GLS regressions results. The coefficients of the GDP variables have a similar magnitude of 0.518 and 0.517 for both OLS and GLS. In this regard, GDP appeared to be an important determinant of OFDI stocks to countries positive growth rate. In other words, China's FDI stock is market-seeking, as GDP is important in determining more foreign investments. This is in line with the studies by Biggeri and Sanfilippo (2009), Buckley et

al. (2009), Chen et al. (2016), Cheng and Ma (2010), Kolstad and Wiig (2011), and Kolstad and Wiig (2012), where a significant and positive relationship is established between Chinese FDI and host country GDP. Similarly, human capital that is proxy by school enrolment ($lnSchenrol_j$) which yielded a significantly positive coefficient at 5 per cent level to support its relationship with FDI stocks. In other words, China stock is determined by the cheap labour available in the region, hence, it is profit-seeking. In fact, Asiedu (2006) Chen et al. (2016) and Dupasquier and Osakwe (2006) believe a nation with strong human capital will encourage investors because the transaction cost will be lower. However, the positive and significant relationship between human capital and Chinese FDI stocks negate Biggeri and Sanfilippo (2009) study that argued that Chinese SOE pays little or no attention to local outsourcing. Overall, these results of GDP and human capital confirms Dunning's eclectic analytical framework of both market-seeking and profit-seeking and the internationalisation process of firm theory.

Although the coefficient of infrastructure is almost similar to -0.504 and -0.503 in both OLS and GLS results, the estimation results for the quality of infrastructure ($lnFixPhone_j$) on FDI stocks is significantly negative at 5 per cent and 1 per cent for OLS and GLS regression respectively. It suggests that Chinese OFDI stocks tend to be negatively correlated with the level of infrastructure development. Although, the result is in contrast with the findings of Asiedu (2006) and Kamara (2013). This is not strange, particularly as the study is on developing oil/minerals exporting countries in Africa with relatively weak infrastructure and depends mostly on oil/minerals revenue that is subject to global fluctuations as their source of foreign earnings (Biggeri & Sanfilippo, 2009; Dupasquier & Osakwe, 2006). Therefore, a lot of Chinese OFDI is in infrastructure, hence, lack of infrastructure is likely to stimulate investment in the host economy. Furthermore, the inadequate infrastructure can be attributed to the attitude of the rent-

seeking political elites in some of the oil/minerals endowed states who will delay infrastructural development projects for cash benefits on oil blocs (Gold et al., 2017; Mthembu-Salter, 2009).

Based on the empirical finding on the quality of institutional structure denoted by political instability ($POLSTAB_j$), political instability has a significant and considerable effect on China's foreign investment stocks in Africa. The variable shows a negative coefficient of -0.63 per cent at 5 per cent significant level in the GLS and OLS results to indicates that Chinese SOE investment in oil/minerals exporting countries in Africa is attracted to less politically stable countries. This is not strange, as Drogendijk and Blomkvist (2013) state that China prefers to invest in countries, they share similar political, cultural and economic settings with. In a further sensitivity analysis, the studies of Asiedu (2006), Kolstad and Wiig (2011) and Kolstad and Wiig (2012) were followed to include control of corruption perception index and Rule of Law index to account for other institutional structures as determinants of FDI stock in the non-reported analysis. These two measures of institutional structures are highly correlated and are not statistically significant or positive coefficients, instead, it reduces the robustness of the results. Therefore, the inclusion of any of them in the FDI stocks regression model would create the problem of multicollinearity, hence, the exclusion from the reported estimation.

On other explanatory variables in the model such as trade openness, inflation and GDP per capita, they have an insignificant impact on FDI stocks. A potential justification for these findings of insignificant relationships between FDI stocks and the variables relate to the development stage of the sampled countries which is likely to play in the opposite direction of that of developed nations. Whereas, inflation, trade openness and GDP per capita are expected to influence the choice of location for Chinese SOE and OFDI stocks, but the empirical results negate the theoretical view. This shows that the degree of

liberalisation, investment policies put in place, the macroeconomic stability of the host country and the level of economic development do not have any effect on Chinese FDI stock.

Moving forward to the 2SLS results in Table 5.6 and 2SLS with robust standard error results in Table 5.7; although stronger estimated coefficients are expected from the estimation results of the instrumental variables 2SLS and 2SLS (robust) as compared to GLS regressions reported, the reported GLS results which are contained in Table 5.5 are almost similar with few exceptions. On this basis, only a few exceptions are discussed. First, quality of infrastructure which is proxy as fix telephone ($lnFixPhone_j$) has an insignificantly negative relationship with FDI, this result is like Biggeri and Sanfilippo (2009) findings. Second, the human capital variable proxy as school enrolment ($lnSchenrol_j$) ceased to have any significant relationship with China's FDI stocks. Also, the estimated coefficient of trade openness ($lnOPENSS_j$) and manufacturing share ($lnMANUShr_{ij}$) that are both insignificant in Table 5.3 (OLS) and Table 5.5 (GLS) results are correctly signed and consistent with theoretical expectations. However, the estimated coefficient of GDP per capita is negatively significant at 5 per cent level. This indicates that the economic development of the host countries negatively correlated with China's FDI stocks, as countries with lesser per capital attract less investment, thus, suggesting that the stage of economic development of African countries seemed an important consideration for China's FDI stocks.

5.3.3 Discussion on the Empirical Results of the Determinants of Chinese Bilateral FDI Flows in Africa Oil/Minerals Exporting Countries

The reported estimated results of Chinese FDI flows in Table 5.3, and Table 5.5 contains that of pooled OLS and GLS estimators. While Table 6.4 contains the reported 2SLS estimates, Table 6.5 contains the 2SLS with robust standard error results. Unlike the results of FDI stocks, in which the explanatory power and magnitude of both OLS and GLS estimators are almost similar, the reported results of the FDI flows on both OLS and GLS models differs, except for GDP ($lnGDP_j$), oil/minerals share $(lnOILShr_{ij})$, agriculture share ($lnAGRICShr_{ij}$), political instability ($POLSTAB_j$) and human capital ($lnSchenrol_j$). Although, political instability results have variations in explanatory powers, yet, their magnitude remains the same. In China's FDI flows reported results, the GDP of the host economies, oil/minerals share, political instability, openness, ($lnOPENSS_j$), human capital and inflation ($Infl_j$) yielded significant coefficients at a 10 per cent level or better to support their effects on FDI flows. An indication that oil/minerals share, macroeconomic policies, market size, the political instability of the host countries and human capital determines China's outward FDI flows, thereby confirming Dunning's eclectic analytical framework. As expected, the share of oil/minerals $(lnOILShr_{ij})$ reported in Table 5.5 under the GLS results indicates that a 1 per cent increase in oil/minerals imports will lead to 0.23 per cent in FDI flows. The results confirm the theoretical underpinning of Chinese FDI been resource-seeking. Whereas, the share of agriculture and manufacturing are both insignificant, but have positive and negative coefficients respectively, a clear indication that oil/minerals import positively determine Chinese FDI flows while agriculture and manufacturing imports shares are not determinant.

The GDP or market size of the host economies has a significant positive relationship with China's outward FDI flows to oil/minerals exporting African countries. The coefficients of the GDP variables have the same magnitude of 0.713 and 0.713 for both OLS and GLS results, with a 1 per cent significance level. An important feature of the host economy market size results is that the magnitude of the effects on Chinese FDI is greater than that of all other determinants in this study. In this regard, an increase in 1 per cent of GDP will lead to an average of 7 per cent in China's FDI flows; this indicates that GDP is a determinant of outward foreign investment flows to nations with growth. In other words, China's FDI in the market-seeking and conforms with Dunning's theory. The results of GDP conform to *a prior* expectation and is in line with the studies of Asiedu (2006), Buckley et al. (2007), Chen et al. (2016), Cheng and Ma (2010) and Kolstad and Wiig (2011).

As expected, uncertainty in the macroeconomic environment discourages FDI flows. For instance, it is expected that, when inflation is low and stable, FDI will have more impact on the populace and it reflects economic stability to foreign investors (Dupasquier & Osakwe, 2006). Hence, the inflation variable used as a measure of macroeconomic stability is positive and significant at 10 per cent level with 0.046 coefficient value in the GLS results reported in Table 5.5. This result aligns with the findings of Biggeri and Sanfilippo (2009) and Buckley et al. (2007) and the empirical results indicate that Chinese investment in the oil/minerals exporting regions in Africa is least affected or deterred by the economic environment.

As a measure of institutional quality, the political instability of the host countries results presented in Table 5.3 (OLS) and Table 5.5 (GLS) are expected to conform with theoretical and empirical expectations which simply state that political instability or political unrest in any nation affects the flows of goods, services and foreign investment.

The coefficients of OLS and GLS are -0.641 and -0.627 and are significantly negative at 10 per cent and 5 per cent level respectively to indicates that Chinese SOE investment in oil/minerals exporting countries in Africa is attracted to less politically stable countries. This result is consistent with the econometric findings of Shan et al. (2018) and confirms the arguments of Alden (2005, 2012) and Zafar (2007) about China's attraction to pariah states and its engagement with countries less democratic than itself. Also, in a further sensitivity analysis, two additional institutional structure control variables (Corruption perception index and Rule of Law index) were introduced into model 3.6. The inclusion follows Asiedu (2006), Kolstad and Wiig (2011), Kolstad and Wiig (2012) and Shan et al. (2018) to test whether control of corruption perception index and Rule of Law index have impacts on China's FDI outflows to Africa. However, neither the Corruption perception index nor Rule of Law index has any significant impact in all the estimates, rather, it reduces the magnitudes and the significant level of other variables in the model. Furthermore, the results indicated the presence of multicollinearity of these institutional variables. Therefore, the variables were dropped from the observations.

The estimation results on the level of infrastructure development in the host countries ($lnFixPhone_j$) is significantly negative at 10 per cent and 5 per cent in the reported OLS and GLS results in Table 5.3 and Table 5.5 respectively. Also, the coefficient of infrastructure is almost similar to -0.440 and -0.441 in both GLS and OLS results. It suggests the low level of infrastructure development tend to attract more outward Chinese FDI flows, that is, a per cent decrease in infrastructure will lead more FDI flows, which the oil/minerals African country will receive from China. Although the results are in divergence with Asiedu (2006), Kamara (2013) and Morisset (2000) findings, it is not strange, as most developing oil/minerals exporting countries in Africa are plagued with relatively weak infrastructure in which China provides as a form of investment or through aid (Biggeri & Sanfilippo, 2009; Dupasquier & Osakwe, 2006).

For the degree of trade openness ($lnOPENSS_j$) effect on FDI inflows, the results show that the effect on FDI is significantly positive at 10 per cent level with 1.187 coefficient only in the GLS estimation. According to the product life cycle theory (Vernon, 1966), trade is a complement to FDI, and improvement in host countries trade liberalisation policies will improve the business environment and boost FDI inflows. Thus, the results suggest that African countries are more open to trade, to export goods produced and services rendered. Hence, they attract more FDI inflows from China. The human capital that is proxy by school enrollment ($lnSchenrol_j$) yielded a significantly positive coefficient at 5 per cent level with a similar magnitude of 4.071 in both OLS and GLS results to support its relationship with FDI flows. In other words, the empirical findings on human capital found that strong human capital of the host economies encourages investors and reduces transaction cost. This finding is contrary to that of the empirical study by Biggeri and Sanfilippo (2009). The positive and significant relationship of human capital on Chinese outward FDI flows in Table 5.3 and Table 5.5 conform with Chen et al. (2016) empirical results where cheap labour enhances FDI but negates the existing argument about Chinese SOE paying little or no attention to local outsourcing (Bräutigam, 2009; Jauch, 2011). In the case of per capita GDP, the effect on FDI flows is negative, but not significant in the OLS and GLS reported results in Table 5.3 and Table 5.5.

The instrumental variables regressions 2SLS and the 2SLS (with robust standard error) results reported in Table 5.6 and Table 5.7, both indicate that oil/minerals import has a highly significant and positive effect on FDI, which suggests a complementary effect between FDI and oil/minerals. Also, the estimated coefficient of GDP, political instability and trade openness are correctly signed and consistent with *a prior* expectation. These results are rather like the GLS estimation, even when it is expected that the estimated

effects will be stronger. However, some variables such as manufacturing imports share, infrastructure, per capita GDP and human capital are the exceptions. For, instance, real per capita GDP is insignificant and negative in both OLS and GLS results in Table 5.3 and Table 5.5 respectively. Whereas, it is significantly negative at 5 per cent level with similar coefficients of -1.377 in both the 2SLS and 2SLS (with robust standard error) estimation results reported in Table 5.6 and Table 5.7. This result suggests that the stage of economic development of African economies tend to be negatively correlated with China's FDI inflows. Although, it is expected that real per capita GDP will determine inflows of FDI to Africa, on the contrary, the stage of economic development or well being of host African economies is not an important consideration for Chinese FDI inflows. Likewise, manufacturing imports share ($lnMANUShr_{ij}$) in both 2SLS and 2SLS (with robust standard error) are negatively significant at a 10 per cent level, with a similar estimated coefficient of -0.259. However, manufacturing imports is not significant and it is negative in OLS and GLS results. This result is understandable, considering the low level of African's manufacturing industries, and the fact that, it is overshadowed by Chinese manufacturing exports (Edwards & Jenkins, 2014; Muhammad et al., 2017). Moreover, infrastructure and human capital that conform to *a prior* expectation in OLS and GLS results ceased to have any significant impact on China's FDI inflows in the 2SLS and 2SLS (with robust standard error) results.

5.4 Summary

The unavailability of bilateral China's standard FDI data that is acceptable by OECD and IMF prior to the year 2000 became a limitation and empirical studies on Sino-Africa FDI determinants are limited; thus, this has led to results and conclusions that are frequently generalised. Ipso facto, this study contributes to the empirical literature on the determinants of China's outward FDI stocks and flows in 18 oil/minerals exporting African countries using panel estimation techniques. The study employs disaggregate

China's imports based on the Harmonized System (HS) data classification from the UN-Comtrade and categorises them into oil/minerals, manufacturing and agriculture. Also, a more comprehensive bilateral Chinese outward FDI data on both stocks and flows to Africa from 2000 to 2015 were obtained from both UNCTAD and MOFCOM. The richness of the information contained in the data set accords the opportunity to analyse over an extended period the importance of a wide set of covariates and test the effects on the countries under study.

To achieve the research objective, OLS, RE, GLS and instrumental variable 2SLS and 2SLS with the robust standard error were employed to identify the imports share(s) and other salient variables that determine Chinese FDI. Based on the empirical analysis, a question that came to mind is whether China's FDI stocks or China's FDI flows are good in predicting the determinants of increasing Chinese investment in Africa. To some extent, FDI stocks are less volatile than flows, and all the R^2 values of FDI stock models are higher than that of FDI flows, but FDI flows have more explanatory power than FDI stocks. The implication of the results shows evidence supporting theories of multinational enterprises (Dunning, 1988) and the internationalisation process of a firm (Johanson & Vahlne, 1977). More importantly, it is observed from the findings that, some of the key variables that determine Western countries and other South-South countries' FDI in Africa are not too different from what determines China's bilateral FDI to host African oil/minerals exporting countries except for the variables of the institutional structure.

CHAPTER 6: THE DETERMINANTS OF CHINA'S BILATERAL AID AND OTHER FINANCIAL FLOWS TO AFRICAN OIL EXPORTING COUNTRIES

6.1 Introduction

This chapter analyses the determinant of China's bilateral aid and other financial flows on 18 oil/minerals exporting countries in Africa empirically. The first section of this chapter reinforces the framework of analysis and the econometric estimation techniques employed to achieve the study objective. This is followed by the presentation of the empirical results, interpretation and discussion of the implications of the findings for the two aid models specified in Chapter three. Also, the last section gives a summary of the chapter.

6.2 China's Loans and Aid Distribution in Africa

According to the State Council, China intends to promote the realisation of Millennium Development Goals, reduce poverty and improve livelihood by directing its funding aids to the low-income countries in Africa. Thus, China's loans to Africa and the distribution across top sectors are depicted in Figure 6.1 and 6.2 although, reliable data on the actual Chinese loans and other development assistance given to Africa are not available prior to the year 2000 (Bräutigam & Jyhjong, 2016; Gold et al., 2017; Gold & Devadason, 2018). However, China's loan and aid data from the beginning of the new millennium as depicted in Figure 6.1 indicate a steady increase even at the peak of global financial crises in 2007.

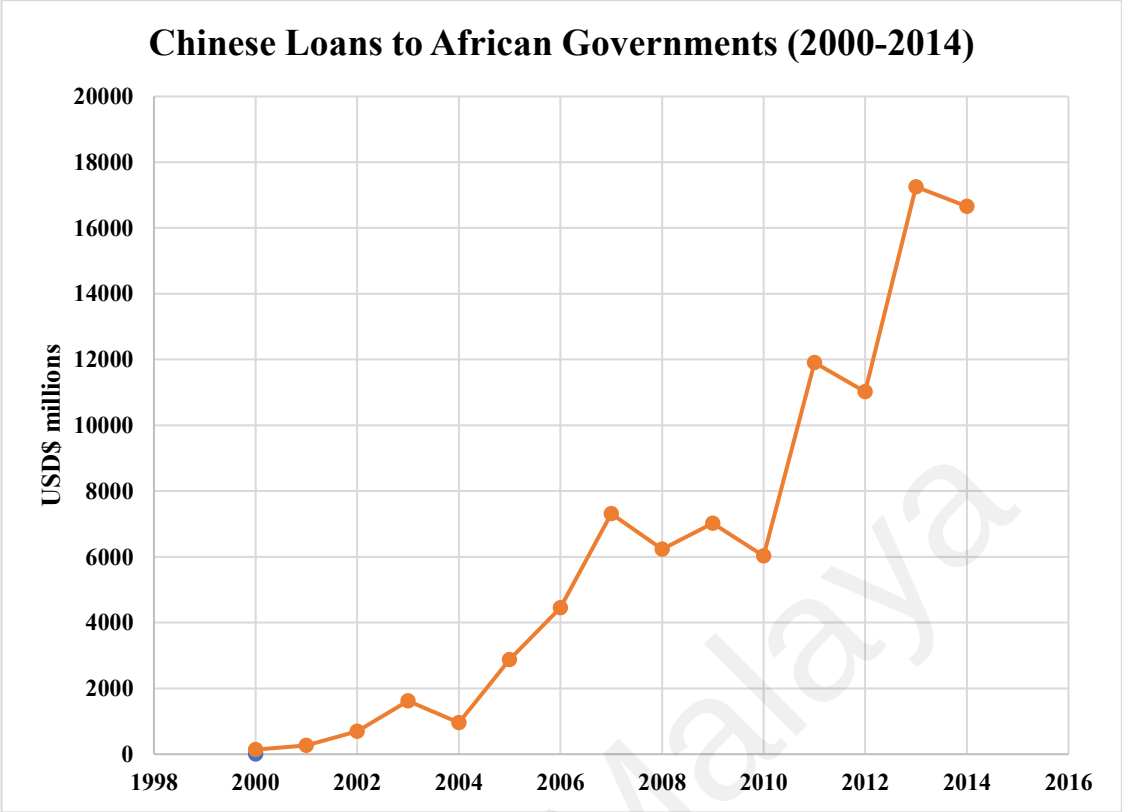

Figure 6.1: China's Foreign Loan to African Countries (2000-2014)

Source: Author's computation from Bräutigam and Jyhjong (2016).

On a regional basis, China's financial assistance to Africa rose from 45.7 per cent to 51 countries as beneficiaries in 2009 to 51.8 per cent in 2012. Whereas, Asia, Latin America and the Caribbean, Oceania, Europe and other regions account for 32.8 per cent, 12.7 per cent, 4 per cent, 0.3 per cent and 4.5 per cent respectively in 2009. These same regions in 2012 accounts for 30.5 per cent, 8.4 per cent, 4.2 per cent, 1.7 per cent and 3.4 per cent. Additionally, China's financial assistance to the LDC and other low-income countries shares of the income is 63.1 per cent in 2009, and 61.1 per cent in 2012. Whereas, the share of financial aid in 2009 to lower-middle-income countries, upper-middle-income countries and others not classified are 19.9 per cent, 11 per cent and 10 per cent respectively, while in 2012, lower-middle-income countries, upper-middle-income countries and others not classified are 21.2 per cent, 13.3 per cent and 5.4 per cent respectively (Xinhua, 2014).

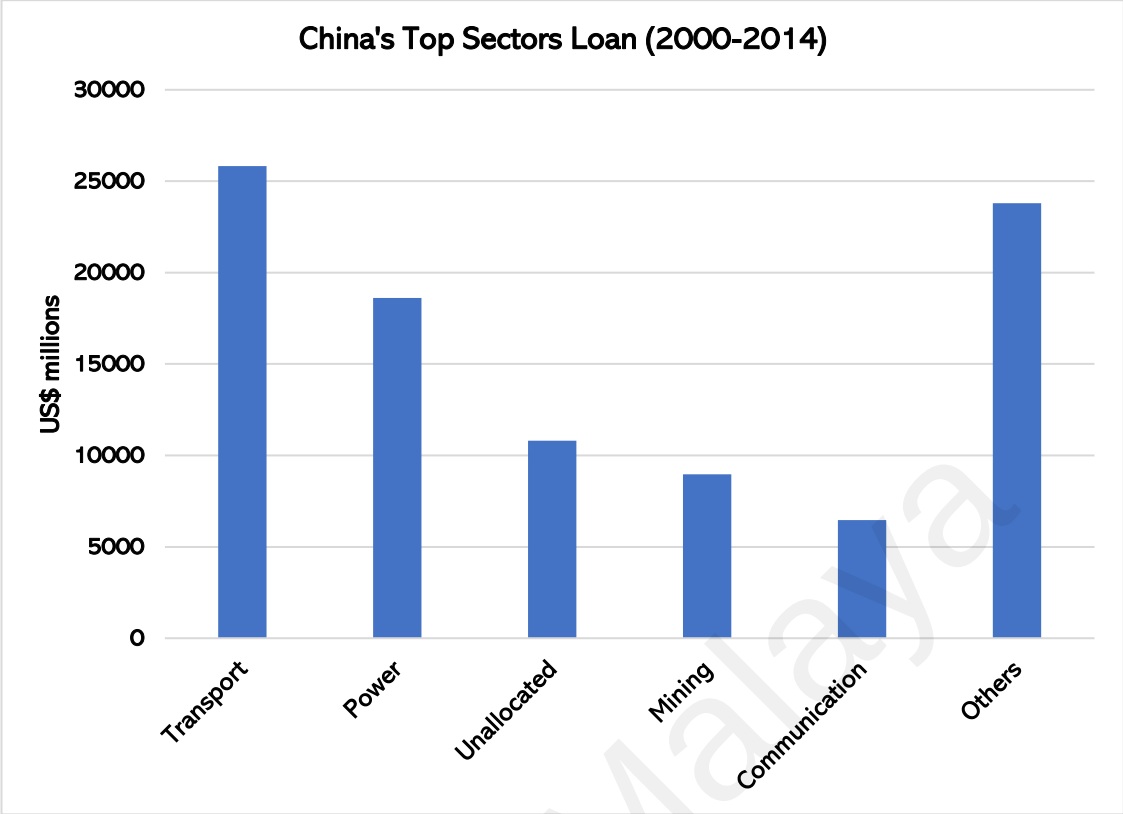

Figure 6.2: China's Foreign Aid Top Sectors Distribution (2000-2014)

Source: Bräutigam and Jyhjong (2016).

Regarding sectoral aid distribution, Chinese loan to Africa covers mainly transport, power, mining and communication. The State Council White Paper reports also indicated that China's foreign assistance between 2000-2014 covered the following eight areas; goods and materials; complete projects; technical cooperation; development of human resource and cooperation; emergency humanitarian aid; medical assistance; volunteer programmes in foreign countries; and debt relief of 1.42billion yuan to nine African HIPC and LDC, namely; Cameroon, Benin, Cote d'Ivoire, Mali, Equatorial Guinea, Tanzania, Sudan, Zambia and Togo (Xinhua, 2014). China provided humanitarian aid and assistance of more than $120million from April 2014 to February 2015 in the quest to combat "Ebola epidemic" haunting some West African countries (*China Daily*, 2015).

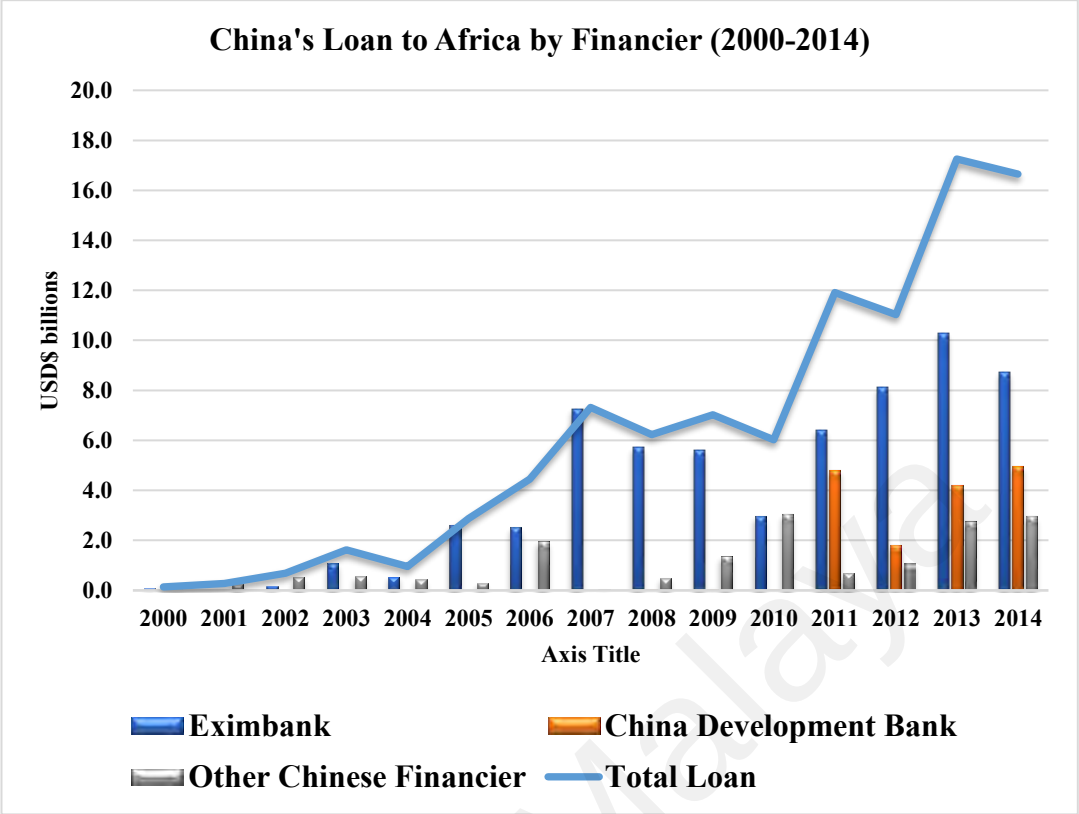

Figure 6.6: China's Foreign Aid (2000-2014)

Source: Bräutigam and Jyhjong (2016).

Thus, in the State Council White Paper reports, China categorised its foreign aids into three broad categories such as grants; interest-free loans and concessional loans that are provided by the Ex-Im-Bank (Xinhua, 2011, 2014). Hence, Bräutigam (2010, 2011b), Broich and Szirmai (2014), Dreher et al. (2018), Kobayashi (2013), Ofodile (2009) and Strange et al. (2013) acknowledged that China's aid to Africa has been consistently on the increase (Figure 6.3), and it adheres to the principle of no strings attached and fewer interference policies. Unlike the Western aid that is bundled with conditionality, China is said to be a game-changer as it has provided Africa with a better opportunity in the bargaining of aid from their traditional partners (Kragelund, 2008; Renard, 2011). Furthermore, Broich and Szirmai (2014) argue that because of the recently published funding aid of China to Africa, China's funding assistant is almost equivalent to that of the Western development assistance to Africa regarding volume and flow.

On the contrary, Kaplinsky and Morris (2009) were quick in pointing out that the bulk of the aid fund remains in China's Exim-Bank, from where it is transferred to State-Owned Enterprises (SOE) to execute the development projects in the recipient country. Likewise, 50 per cent of the materials and equipment to be used were procured from China (Bing & Ceccoli, 2013). Bräutigam (2009) observes that China uses its concessional financial funding given to Africa to penetrate and have unlimited access to its raw materials and lucrative markets while evidence has shown that its principle of less interference encourages corruption, mismanagement, lack of accountability, human rights violations and other negative externalities in their investments funding especially to low-income African states who are either in debt or has poor governance institution (Bräutigam, 2009; Ofodile, 2009). In corroboration, Ofodile (2009) and Tull (2006) have doubts about the actual benefits of economic assistance to the ordinary people in the recipients' country.

Furthermore, in illustrative case studies on Ghana's Bui Dam and DRC mining and reconstruction, Bräutigam (2011b) states that China's 'concessional loan' and 'tied aid' cannot be regarded as 'development aid' (p.215) because it is almost at par with the commercial lending rates. Correspondingly, Alden (2005, 2012) and Bräutigam (2010, 2011a, 2011b) point out that since China's Ex-Im-Bank as shown in Figure 6.3, has been able to *'loan-out'* to a traditional financial provider like the World Bank, with time, it will fall in-line with basic global standards. Also, Zafar (2007) argues that China is an emerging economy itself, its aid to Africa is not large or equivalent to that of the Western donors. Similarly, Bräutigam (2010, 2011b) stated that Chinese aid to Africa estimated by some researchers was over-bloated. In 2008 and 2009, China's ODA disbursement was $1.2billion and $1.4billion respectively, as against the U.S.A. $7.2billion, World Bank $4.1billion and France $3.2billion ODA to Africa. Therefore, apparently, there is

no definite official China's aid definition presently, and this has given rise to the ambiguity in Chinese foreign aid policy circles.

6.3 Chinese Foreign Aid-For-Altruism to Africa Model Estimation Framework

In line with the standard practice initiated by Biggeri and Sanfilippo (2009), panel estimation technique is employed to capture the determinants of China's (donor) aid and other financial flows[26] ($lnChinaLoans_{ij}$) to Africa (recipient). To achieve this objective, equation (3.7) is used to analyse whether China's aid is determined by altruism motive. The choice of imports of China from Africa to determine altruism motive and China's exports to Africa in determining economic motive is based on the empirical studies Fielding and Gibson (2013); Selaya and Sunesen (2012), where the central motive for giving aid is for donor country to export to recipient country to improve donor's economy, while donor's imports from recipient is to help improve the welfare of the recipient's populace. On this premise, the variables China's imports share from Africa oil/minerals exporting countries is being used to determine aid for altruism and China's exports share variables are used to determine aid for economic motive in Section 6.4. In equation (3.7), China's bilateral aid ($lnChinaLoans_{ij}$) to oil/minerals exporting African countries is used as the dependent variable and imports classified into oil/minerals $(lnIMOILShr_{ij})$ agriculture ($lnIMAGRICShr_{ij}$), manufacturing ($lnIMMANUShr_{ij}$) and other explanatory variables like total debt $(lnDebt_j)$, political instability ($POLSTAB_j$), the infant mortality rate ($Mortalityrate_j$), trade openness ($lnOPENSS_j$), real per capita GDP ($lnGDPperk_j$) and GDP ($lnGDP_j$). The choice of panel estimation technique is

[26] Aid in this Chapter, and as it is being refer to in the entire thesis encompass China's aid and other financial flows to African countries understudy. The decision to stick with the nomenclature 'aid' is based on the Bräutigam (2010, 2011a, 2011b) studies where all economic China's economic cooperation are tagged as aid. As well, China's bilateral loan's data (that includes, ODA and other financial flows) are used to measure aid.

made because the time series is too short to estimate for each country separately. Hence, the data are pooled, and panel data is considered an appropriate technique. Also, panel analysis is regarded as a suitable technique due to the identified advantages of the ability to tackle heterogeneity of variables over a period; taking into consideration omitted variables and limiting collinearity between the explanatory variables (Baltagi, 2008; Flannery & Hankins, 2013). Specifically, China's loan is used as the dependent variable in the model to capture the direct effect that aid exerts on the exploratory variables. A measurement of the aid-for-altruism is to confirm whether China's motive is consistent with aid effectiveness and rationale for aid theories.

Hence, China's annual loans dataset retrievable from China Africa Research Initiative database from 2000 to 2015[27] is the dependent variable for 18 oil and minerals exporting African countries, and the model sample consists of an unbalanced panel of 288 (1 x 18 x 16) observations. Moreover, the data for disaggregate-by-product China's imports include all traded *goods* listed on the UN-Comtrade Harmonized System (HS) 1-99 nomenclature and is categorised into agriculture (HS 1-24), oil/minerals (HS 25-27) and manufacturing (HS 28-99). Usually, in the empirical study of this nature, trade in *services* should be included, especially in China-Africa studies on foreign aid and other financial flows, that is most often tied to construction or consulting services rendered in the form of donated services. Regrettably, both imports and exports of services were exempted from the analysis due to the lack of comparable data for the relevant trading partners (Wagner, 2003).

[27] The choice of the period of the study is basically underscored by the availability of data on Chinese loans (aid and other financial flows) to Africa which were not available prior to year 2000 (Bräutigam & Jyhjong, 2016). The Chinese loan dataset retrieved from China Africa Research Initiative (CARI) is the reliable considering that there is no other official China's international cooperation data.

Thus, the primary advantage of the model stated in equation (3.7) is that; it can be analysed using pooled OLS regression, FE panel estimation with a robust standard error that allows for country-specific aid factor in individual countries due to the absence of time-invariant variables or with GLS estimator. However, it is worth mentioning that, the decision to use the above estimation techniques was based on the statistical diagnostic test carried out to determine their suitability on the aid-for-altruism motive and whether the results are free from biases and are valid. In the first instance, the results of Breusch-Pagan/Cook-Weisberg test for heteroskedasticity performed on the OLS regression is significant which shows that the null hypothesis should be rejected, due to the presence of heteroskedasticity in the cross-section. On the other hand, the results of Wooldridge test for autocorrelation in panel data is not significant, hence, the null hypothesis is accepted since the estimated result is free of serial correlation problem. Also, the Variance Inflation Test (VIF) for multicollinearity mean is 2.50, meaning that the pooled OLS regression analysis results did not suggest the presence of multicollinearity issues.

Based on the outcome of the diagnostic tests, OLS (fixed effects) can be used to tackle the heteroskedasticity issue in the regression. This led to the use of FE regression in which the choice between RE and FE were determined by Hausman test (Hausman & Taylor, 1981), which the *p*-value is significant to confirm the relevance of using FE over RE. Likewise, the results of the modified Wald test for group-wise heteroskedasticity in an FE regression model rejected the null hypothesis, indicating the presence of heteroskedasticity in FE results. Therefore, to resolve this issue of heteroskedasticity, the model is re-estimated using FE with robust standard errors and GLS estimator is used for consistency check. Ideally, it is best to re-estimate the model using either panel corrected standard errors (PCSE) as proposed Beck (2001) and Beck and Katz (1995) or feasible GLS to tackle the problem more comprehensively, but no time periods are common to all panels. Therefore, Stata cannot estimate disturbance covariance matrix using casewise

PCSE inclusion. As expected, the GLS results presented in Table 6.1 tackle the white correction for heteroskedasticity in the cross-section and gives stronger results. Furthermore, to deal with likely endogeneity problem, the dynamic fixed effects regression estimated error correction form is adapted to estimate equation (3.7). The dynamic panel estimator properties hold when N $(number\ of\ cross\ section\ units)$ is longer, and T $(time\ periods)$ is shorter, and the long-run and short-run of the results is reported in Table 6.3. However, the explanatory power and the magnitude of the results are way lesser than that of the reported GLS estimation. On this premise, much emphasis is placed on the GLS results due to its robustness.

6.3.1 Results Presentation and Discussion on the Imports Determinants of Chinese Bilateral Aid and Financial Flows to Oil/Minerals Exporting Africa Countries

The reported GLS estimation results that are presented in Table 6.1 is interpreted alongside the Pesaran dynamic fixed effects regression results that are reported in Table 6.3. While the regression results of the FE and robust standard errors are reported in Table 6.2. However, the two fixed effects (FE) regression results are entirely excluded from the discussion, on the basis that its magnitude and explanatory powers are less significant to both pooled OLS and GLS estimators. A comparison of the two specifications (OLS and GLS results) indicated little variation in their estimated coefficients and the explanatory power of all variables estimated are qualitatively similar without any exception. This reflects a little action in the temporal dimension in the dataset. Besides, the GLS log-likelihood value is -187.348 Wald Chi^2: 75.89, p = 0.000 (which indicates that the null hypothesis must be rejected at 1 per cent significant level), confirms the validity of the estimator.

Table 6.1: Regression Results of the Imports Determinants of China's Aid in Africa Using Pooled OLS and GLS Estimators (2000-2015)

Variables	Coefficients (Pooled OLS)	*p*-value	Coefficients (GLS)	*p*-value
$lnDebt_j$	-0.350***	0.008	-0.350***	0.006
	(-2.67)		(-2.76)	
$POLSTAB_j$	-0.242**	0.025	-0.242**	0.019
	(-2.27)		(-2.35)	
$lnIMMANUShr_{ij}$	0.136***	0.000	0.136***	0.000
	(3.94)		(4.07)	
$lnIMOILShr_{ij}$	0.023	0.439	0.023	0.422
	(0.78)		(0.80)	
$lnIMAGRICShr_{ij}$	0.136***	0.000	0.136***	0.000
	(5.76)		(5.96)	
$Mortalityrate_j$	-0.003	0.149	-0.003	0.133
	(-1.45)		(-1.50)	
$lnOPENSS_j$	-0.313	0.238	-0.313	0.221
	(-1.18)		(-1.22)	
$lnGDPperk_j$	0.204**	0.046	0.204**	0.037
	(2.01)		(2.08)	
$lnGDP_j$	-0.203*	0.093	-0.203*	0.080
	(-1.69)		(-1.75)	
Constant	8.226***	0.001	8.226***	0.001
	(3.27)		(3.39)	
R-squared	0.332			
Adj. R-squared	0.289			
Number of observations	153		153	
Log-Likelihood			-187.348	
Wald chi^2			75.89	
(Prob > chi^2)			(0.000)	

Note: All estimations are carried out with Stata 12 software. The coefficients and *t*-values for pooled OLS are in parentheses. Also, the estimated *z*-statistics for GLS are in parentheses; Wald chi^2 test *p*-values in brackets; Asterisk *, ** and, *** denotes the level of significance at 10%, 5% and 1% respectively. Also, the detail results of the robustness check are presented as an appendix.

Table 6.2: Regression Results of the Imports Determinants of China's Aid in Africa Using Fixed Effects and Fixed Effects (robust standard error) Estimators (2000-2015)

Variables	Coefficients (Fixed effect)	*p*-value	Coefficients (Fixed effect robust)	*p*-value
$lnDebt_j$	0.019	0.924	0.019	0.924
	(0.10)		(0.19)	
$POLSTAB_j$	0.320**	0.039	0.320**	0.039
	(2.26)		(0.14)	
$lnIMMANUShr_{ij}$	0.117*	0.087	0.117*	0.087
	(1.83)		(0.06)	
$lnIMOILShr_{ij}$	-0.018*	0.097	-0.018*	0.097
	(-1.77)		(0.01)	
$lnIMAGRICShr_{ij}$	0.026	0.425	0.026	0.425
	(0.82)		(0.031)	
$Mortalityrate_j$	-0.005	0.691	-0.005	0.691
	(-0.41)		(0.013)	
$lnOPENSS_j$	-0.674*	0.077	-0.674*	0.077
	(-1.90)		(0.36)	
$lnGDPperk_j$	1.441***	0.003	1.441***	0.003
	(3.58)		(0.40)	
$lnGDP_j$	1.283	0.159	1.283	0.159
	(1.48)		(0.87)	
Constant	-41.183*	0.085	-41.183*	0.085
	(17.62)		(22.33)	
R-squared	0.500		0.500	
Number of observations	153		153	

Note: All estimations are carried out with Stata 12 software. The coefficients and *p*-values for both fixed effects and fixed effects (robust) are in parentheses. Asterisk *, ** and, *** denotes the level of significance at 10%, 5% and 1% respectively.

Table 6.3: Pesaran Dynamic Fixed Effects Regression Estimated Imports Results on the Determinants of China's Aid on Africa (2000-2015)

Variables	Coefficients (long run)	*p*-value	Coefficients (short run)	*p*-value
$lnDebt_j$	-0.049	0.803	-0.267	0.384
	(-0.25)		(-0.87)	
$POLSTAB_j$	0.341	0.168	0.469	0.166
	(1.38)		(1.38)	
$lnIMMANUShr_{ij}$	0.251***	0.003	-0.152**	0.017
	(3.02)		(-2.38)	
$lnIMOILShr_{ij}$	-0.003	0.951	-0.055	0.120
	(-0.06)		(-1.56)	
$lnIMAGRICShr_{ij}$	0.042	0.497	-0.042	0.411
	(0.68)		(-0.82)	
$Mortalityrate_j$	-0.027**	0.041	0.001	0.995
	(-2.04)		(0.01)	
$lnOPENSS_j$	-1.347**	0.011	0.152	0.792
	(-2.54)		(0.26)	
$lnGDPperk_j$	0.499	0.513	-3.528**	0.030
	(0.65)		(-2.16)	
$lnGDP_j$	-0.336	0.743	4.174**	0.053
	(-0.33)		(1.94)	
Constant			9.467	0.723
			(0.35)	
Error correction (ECM)			-1.046***	0.000
			(-8.26)	

Note: All estimations are carried out with Stata 12 software. The coefficients and the *z*-values for all variables are given in parentheses. Asterisk *, ** and, *** denotes level of significance at 10%, 5% and 1% respectively.

As expected, the GLS estimation results of bilateral Chinese aid to oil/minerals exporting African countries reported in Table 6.1 indicated that variables included in the model such as infant mortality rate, political instability, and total external debt have the expected signs and significance. The three variables of interest that capture China's imports such as, oil/minerals, agriculture and manufacturing show that oil/minerals do not have any meaningful effects on aid in both GLS and the Pesaran dynamic fixed effects regression results reported in Table 6.1 and Table 6.3 respectively. Whereas, manufacturing and agriculture are both positive and strongly significant at 1 per cent level with the magnitude of the manufacturing import coefficient being a bit lower at 0.135 than that of agriculture at 0.136 in the GLS reported results in Table 6.1. This indicates that the relationship between aid and manufacturing imports; and, between aid and agriculture imports are larger, suggesting the importance of aid in enabling more imports from China.

Similarly, in the reported Pesaran dynamic fixed effects regression long-run results in Table 6.3, manufacturing is significantly positive at 1 per cent level with 0.251 coefficient estimates. On balance, the significance of manufacturing is relatively robust across the various estimations, although it is negatively significant at 5 per cent level in the short run. Also, agriculture variable is negative and insignificant in the short-run and does not affect the long-run. From these results, one can deduce that oil/minerals are uncorrelated with Chinese aid. This is justifiable because the oil/minerals sector is highly capital intensive in which resource-exporting countries rely on Joint Ventures/Partnership from MNC and TNC (including Chinese SOE) for operation (Gold et al., 2017; Taylor, 2015). Therefore, the extractive industry may not require aid. Instead, aid is provided in the form of corporate social responsibilities (CSR) to the communities where the oil and minerals are being extracted. More importantly, China's economic cooperation interest in the form of aid has been in agro and allied industries, construction, consulting and related services in which the data are not available (Nissanke, 2013). Thus, these results contradict the finding of Biggeri and Sanfilippo (2009) and indicate the importance of employing an econometric model that allows the computation of comparative statistics. Therefore, caution should be applied in interpreting the determinants of Chinese aid amongst these three imports variables of interest.

Based on the GLS regression results reported in Table 6.1, the institutional structure variable proxy as political instability is significant at 5 per cent level, indicating a 1 per cent decrease in the political stability index will facilitate aid by -0.241 per cent. Whereas, this variable failed to have any meaningful effects on aid in the Perasan dynamic fixed effects regression results as reported in Table 6.3. The negatively significant coefficient estimates of this variable in the GLS results conform to convention view that China's aid to oil/minerals exporting countries in Africa may be due to political instability. The signs of the coefficient of the political instability results are consistent with Biggeri and

Sanfilippo (2009). Furthermore, given the policy implications that will arise from the results of this empirical findings, and to correct any misspecifications, robustness check and sensitivity analysis were carried out to include more institutional variables in the analysis. Thus, the control of Corruption index and Rule of Law index were included as two alternative specifications to account for other institutional factors as determinants of China's aid in non-reported analysis. However, the significance level and magnitude of other variables of interest changed considerably, giving somewhat different results and reducing the robustness of the results. This is because, these two variables are highly correlated, hence, the exclusion from the reported estimations.

The reported results of GDP, which is a measure of the size of the recipient country's market size, have a lower magnitude of -0.202, which is significantly negative at 10 per cent level in the GLS regression results. Considering the results based on the importance of market size, the coefficients of GDP variable reported has smaller magnitudes. It indicates that China's aid goes to countries with higher GDP and since most of the oil/minerals exporting countries are relatively big in terms of foreign earnings. However, it is significantly positive at 5 per cent level with a high coefficient of 4.174 in the short-run Pesaran dynamic effect regression results, and insignificantly negative in the Pesaran dynamic effects regression long-run results with a lower coefficient of -0.336. From the short-run Pesaran dynamic effects regression results, it can be deduced that size of the recipient's economy, and China's aid conforms with theoretical expectation, even when this cannot be guaranteed in the long-run. In other words, oil/ minerals exporting African countries are more sensitive to proportional variations in levels of Chinese aid.

The degree of trade openness variable in both GLS regression and Pesaran dynamic fixed effect results did not conform to *a prior* expectation, as the results show that the effect of aid on trade openness is more negative. In the GLS results reported in Table 6.1,

trade openness variable is insignificantly negative with -0.312 coefficients. Also, in the Pesaran dynamic fixed effect regression results reported in Table 6.3, the degree of trade openness variable has no significant effect in the short-run, but significantly negative at 5 per cent level with -1.347 coefficients in the long-run. This indicates that China's aid is negatively correlated with Africa's trade openness. However, it will be incautious to conclude that trade openness has no role in conditioning the macroeconomic impact of aid increase, even when the proxy used do not provide any indication for such effect (Fielding & Gibson, 2013).

External debt total of the recipient's country is included in the model to ascertain Biggeri and Sanfilippo's (2009, p. 41) claim that China's capital flows are channelled into heavily indebted, or net aid resources endowed African countries like Angola and Sudan (though, Sudan and Zimbabwe are excluded from the study). Also, it is to determine whether the indebtedness of oil/minerals exporting countries affects Beijing's interest in giving aid. On this premise, total external debt that is used as a proxy for indebtedness rate is significantly negative at 1 per cent level with -0.350 estimated coefficients in the GLS regression results. The results suggest that a per cent decrease in total external debt decrease China's aid by 0.35 per cent.

For the real per capita GDP results, the magnitude of the estimated coefficient is higher for the GLS (0.204) than the Pesaran dynamic fixed effects (-3.528), and it is positive and significant at 5 per cent level for the GLS while it is negative and significant at 5 per cent level in the Pesaran dynamic fixed effects regression short-run results. Thus, the reported real per capita GDP in the GLS results have the expected sign and significance, indicating that the recipient country's economic development determines or attracts more China's aid (Neumayer & Spess, 2005). This is expected because of the dependent variable ($lnChinaLoans_{ij}$) includes other financial flows from China aside aid. On the other

hand, the estimated Pesaran dynamic fixed effects reported results indicate that the lower the per capita, the lesser the aid. This show that China cares less about reducing poverty in the African oil/minerals exporting countries under study.

In the case of the mortality rate, the magnitude of the coefficient is -0.002, and it is insignificantly negative in the GLS results. Similarly, the magnitude of the coefficient is low at 0.001, without any effect on the mortality rate in the short-run Pesaran dynamic fixed effects regression results. Whereas, it is statistically significant and negative at 5 per cent level with -0.027 coefficients in the long-run Pesaran dynamic fixed effects results reported in Table 6.3. The inclusion of this variable is to complement real per capita GDP, which according to Trumbull and Wall (1994), Wall (1995) and Younas (2008) is not enough measure of recipients' well-being and economic needs for aid. Therefore, the results for infant mortality rate in the long run support that of GDP per capita in the short run with the significantly negative and lower coefficients, which indicate that China as donor care less about improving the physical well-being of the oil/minerals endowed nation in Africa. In other words, China as an aid donor focuses not on the real infant mortality rate of African oil/minerals endowed countries as a *de facto* measure of well-being but on per capita GDP.

6.4 Chinese Foreign Aid-For-Economy to Africa Model Estimation Framework

Using the aid model initiated by Biggeri and Sanfilippo (2009) and Vijil and Wagner (2012), panel estimation technique is employed to examine whether China's (donor) aid ($lnChinaLoans_{ij}$) to Africa (recipient) is determined by an economic motive[28]. On this premise, equation (3.8) is specified to examine whether China's aid is for the trade-related

[28] To avoid repetition, the justification for the use of China's exports share to determine economic or trade related motive is explained in Section 6.3.

motive. In this equation (3.8), China's bilateral aid ($lnChinaLoans_{ij}$) to oil/minerals exporting Africa countries is used as the dependent variable. As stated in section 6.3, exports are classified into oil/minerals $\left(lnEXOILShr_{ij}\right)$ agriculture ($lnEXAGRICShr_{ij}$) and manufacturing ($lnEXMANUShr_{ij}$). Other explanatory variables included in the model are total external debt $\left(lnDebt_j\right)$, trade openness ($lnOPENSS_j$), control of corruption perception ($Corrpt_{jt}$), real per capita GDP ($lnGDPperk_j$), the infant mortality rate ($Mortalityrate_j$) and GDP ($lnGDP_j$).The choice of panel estimation technique to examine research question three (3) is because the time series is too short to estimate for each country separately. Hence, the data are pooled, and panel data is considered an appropriate technique. Also, panel analysis is regarded as a suitable technique due to its identified advantage of tackling serial correlation in the variables over a period; take into consideration omitted variables and limiting collinearity between the explanatory variables (Baltagi, 2008; Flannery & Hankins, 2013). Specifically, China's loan is used as the dependent variable in these models to capture the direct effect that aid and other financial flows exert on the exploratory variables. A measurement of the linkage between aid and trade is informed based on the notion that China, like every other donor country, uses aid as a predatory instrument for unfair commercial gain (Wagner, 2003).

Hence, China's annual loans dataset retrievable from China Africa Research Initiative database from 2000 to 2015 is the dependent variable for the 18 oil/minerals exporting African countries, and the model sample consists of an unbalanced panel of 288 (1 x 18 x 16) observations. Moreover, the data for disaggregate-by-product China's exports include all traded *goods* listed on the UN-Comtrade Harmonized System (HS) 1-99 nomenclature and is categorised into agriculture (HS 1-24), oil/minerals (HS 25-27) and manufacturing (HS 28-99). Thus, the model stated in equation (3.8) is first examined using pooled OLS regression, FE estimator with a robust standard error that allows for

country-specific aid factor in individual countries due to the absence of time-invariant variables and GLS estimator for consistency check. The decision to use the above estimation techniques was based on the statistical diagnostic test carried out to determine their suitability on the aid-trade motive and whether the results are free from biases and are valid. Firstly, the Breusch-Pagan/Cook-Weisberg test for heteroskedasticity performed on the OLS regression is insignificant, which shows that the null hypothesis of constant variance should be accepted, because of the absence of heteroskedasticity in the cross-section. Secondly, the results of the Wooldridge test for autocorrelation in panel data is significant; hence, the null hypothesis of no first-order autocorrelation is rejected due to the presence of serial correlation problem in the OLS estimated ss. Lastly, the Variance Inflation Test (VIF) for multicollinearity mean is 2.13, which indicates that in the pooled OLS regression results, there are no multicollinearity issues among the variables.

Based on the outcome of the diagnostics tests, which shows that the OLS regression suffers from only serial correlation issue, then, FE estimator is used to tackling the autocorrelation issue in the regression. Also, the use of FE regression in which the choice between RE and FE was determined by Hausman test (Hausman & Taylor, 1981), which shows that the *p*-value is significant to confirm the superiority of using FE over RE. Likewise, the results of the modified Wald test for group-wise heteroskedasticity in FE regression model is significant, hence, the null hypothesis is rejected since it indicates the presence of heteroskedasticity in FE results. Therefore, to resolve this issue of heteroskedasticity in the FE, the model is re-estimated using FE with robust standard errors and GLS estimator is used for consistency check. Preferably, it is best to re-estimate the model using either PCSE as proposed by Beck (2001) and Beck and Katz (1995) or feasible GLS to tackle the problem more comprehensively, but no time periods are common to all panels. Therefore Stata cannot estimate disturbance covariance matrix

using casewise PCSE inclusion. It is expected that the GLS results presented in Table 6.4 will tackle the first-order autocorrelation in the cross-section and gives stronger results. However, the results are not too different from that of the reported pooled OLS in the same Table. Furthermore, to deal with likely endogeneity problem, the dynamic fixed effects regression estimated error correction form is adapted to estimate equation (3.8) and the results are reported in Table 6.6. However, the explanatory power and the magnitude of the results are way lesser than the reported GLS and FE estimations. On this premise, much emphasis is placed on the GLS and FE due to its robustness.

6.4.1 Presentation and Discussion of Results on the Exports Determinants of Chinese Bilateral Aid and Financial Flows to Oil/Minerals Exporting Africa Countries

The reported GLS estimation results that are presented in Table 6.4 is interpreted alongside the FE (with robust standard error) and Pesaran dynamic fixed effects regression results that are reported in Table 6.5 and Table 6.6. Although in the pooled OLS regression results reported in Table 6.3, less emphasis is placed on it as it is only used as a reference to other results. Unlike the aid-for-altruism results presented in Section 6.3, the fixed effects (FE) regression results are not excluded from the discussion in this Section, on the basis that its magnitude and explanatory powers are more significant on nearly different variables when compared to both OLS and GLS estimators that have few significant results. A comparison of the two specifications (OLS and GLS results) indicated little variation in their estimated coefficients while the magnitude and explanatory power of all variables estimated are qualitatively similar without any exception. This reflects a little action in the temporal dimension in the dataset. Besides, the GLS log-likelihood value is -291.972; Wald Chi^2: 20.66, p = 0.014 (which null hypothesis is rejected at a 5 per cent significant level), confirms the validity of the estimator.

Table 6.4: Regression Results of the Determinants of China's Aid in Africa Using Pooled OLS and GLS Estimators (2000-2015)

Variables	Coefficients (Pooled OLS)	*p*-value	Coefficients (GLS)	*p*-value
$lnDebt_j$	-0.235*	0.061	-0.235**	0.054
	(0.13)		(0.12)	
$Corrpt_{jt}$	-0.541***	0.004	-0.541***	0.003
	(0.19)		(0.18)	
$lnEXMANUShr_{ij}$	0.036	0.687	0.036	0.679
	(0.09)		(0.09)	
$lnEXOILShr_{ij}$	0.037	0.658	0.037	0.650
	(0.09)		(0.08)	
$lnEXAGRICShr_{ij}$	0.124	0.162	0.124	0.151
	(0.09)		(0.09)	
$Mortalityrate_j$	-0.004**	0.043	-0.004**	0.037
	(0.02)		(0.00)	
$lnOPENSS_j$	-0.206	0.329	-0.206	0.316
	(0.21)		(0.21)	
$lnGDPperk_j$	-0.111	0.210	-0.111	0.197
	(0.09)		(0.09)	
$lnGDP_j$	0.143	0.180	0.143	0.168
	(0.11)		(0.11)	
Constant	2.782	0.212	2.782	0.199
	(2.22)		(2.17)	
R-squared	0.0896			
Adj. R-squared	0.0896			
Number of observations	210		210	
Log-Likelihood			-291.972	
Wald chi^2			20.66	
(Prob > chi^2)			(0.014)	

Note: All estimations are carried out with Stata 12 software. The coefficients and *p*-values for pooled OLS and the estimated *z*-statistics for GLS are in parentheses; Wald chi^2 test *p*-values in brackets; Asterisk *, ** and, *** denotes the level of significance at 10%, 5% and 1% respectively.

Table 6.5: Regression Results of the Exports Determinants of China's Aid in Africa Using Fixed Effects and Fixed Effects (robust standard error) Estimators (2000-2015)

Variables	Coefficients (Fixed effect)	*p*-value	Coefficients (Fixed effect Robust)	*p*-value
$lnDebt_j$	0.089	0.538	0.089	0.532
	(0.14)		(0.14)	
$Corrpt_{jt}$	0.067	0.826	0.067	0.870
	(0.30)		(0.40)	
$lnEXMANUShr_{ij}$	0.116	0.110	0.116**	0.044
	(0.07)		(0.05)	
$lnEXOILShr_{ij}$	-0.077	0.239	-0.077	0.222
	(0.065)		(0.06)	
$lnEXAGRICShr_{ij}$	0.043	0.576	0.043	0.474
	(0.08)		(0.06)	
$Mortalityrate_j$	-0.029***	0.000	-0.029***	0.002
	(0.01)		(0.01)	
$lnOPENSS_j$	-0.557**	0.052	-0.557**	0.047
	(0.29)		(0.26)	
$lnGDPperk_j$	1.6671***	0.000	1.6671***	0.000
	(0.42)		(0.28)	
$lnGDP_j$	0.307	0.495	0.307	0.601
	(0.45)		(0.57)	
Constant	-17.103	0.111	-17.103	0.240
	(10.67)		(13.97)	
R-squared	0.535		0.535	
Number of observations	210		210	

Note: All estimations are carried out with Stata 12 software. The coefficients and *t*-values for both fixed effects and fixed effects with robust standard error are in parentheses. Asterisk *, ** and, *** denotes the level of significance at 10%, 5% and 1% respectively.

Table 6.6: Pesaran Dynamic Fixed Effects Regression Estimated Results on the Determinants of China's Aid on Africa (2000-2015)

Variables	Coefficients (long run)	*p*-value	Coefficients (short run)	*p*-value
$lnDebt_j$	0.047	0.796	0.301	0.214
	(0.18)		(0.24)	
$Corrpt_{jt}$	-0.238	0.558	0.329	0.444
	(0.41)		(0.43)	
$lnEXMANUShr_{ij}$	0.169	0.119	-0.069	0.371
	(0.11)		(0.08)	
$lnEXOILShr_{ij}$	-0.105	0.331	0.059	0.381
	(0.11)		(0.07)	
$lnEXAGRICShr_{ij}$	0.128	0.282	-0.014	0.864
	(0.12)		(0.08)	
$Mortalityrate_j$	-0.038***	0.000	-0.031	0.550
	(0.01)		(0.05)	
$lnOPENSS_j$	-0.541	0.189	-0.471	0.227
	(0.41)		(0.39)	
$lnGDPperk_j$	1.452**	0.013	-3.719***	0.002
	(0.58)		(1.23)	
$lnGDP_j$	0.034	0.959	2.669**	0.041
	(0.66)		(1.31)	
Constant			-7.588	0.613
			(14.99)	
Error correction (ECM)			-0.939***	0.000
			(0.09)	

Note: All estimations are carried out with Stata 12 software. The coefficients and the *z*-values for all variables are given in parentheses. Asterisk *, ** and, *** denotes level of significance at 10%, 5% and 1% respectively.

The GLS estimation results of bilateral Chinese aid to African oil/minerals exporting countries reported in Table 6.4 indicated that total external debt $(lnDebt_j)$, corruption perception index ($Corrpt_{jt}$) and infant mortality rates ($Mortalityrate_j$) are the only few variables that have the expected negative signs and are significant at 5 per cent (-0.235), 1 per cent (-0.541), and 5 per cent (-0.004) respectively. Debt $(lnDebt_j)$ of the recipient country included in the model. The total external debt rate is significantly negative at 5 per cent level with -0.235 estimated coefficients in the GLS regression results only. The results suggest that a 1 per cent decrease in total debt decrease China's aid by 0.235 per cent. C

In general, the lower the level of corruption, that is, gross abuse of public power for private or elites' benefits within a government, the more the aid allocation. However, from the GLS regression results reported in Table 6.4, the institutional structure variable

proxy as control of corruption perception is significant at 1 per cent level. The sign of the coefficient of control of corruption result is consistent with the finding of Asiedu (2002). This indicates that a 1 per cent decrease in the control of corruption will facilitate aid by 0.541 per cent. Whereas, corruption variable failed to have any meaningful effects on aid in the FE and the Perasan dynamic fixed effects regression results as reported in Table 6.5 and Table 6.6. Nevertheless, the negatively significant coefficient estimates of this variable in the GLS results indicate that China's aid to oil/minerals exporting countries in Africa is determined by lower control of corruption. This aligns with Gu (2009) argument that China bothers less about the host country level of corruption. Since China's remarkably high corruption level makes them be sympathetic and engage with corrupt governments, therefore, the likelihood of corruption is not alarming (Kolstad & Wiig, 2012). Furthermore, given the policy implications that will arise from the results of this empirical findings, and to correct any misspecifications, robustness check and sensitivity analysis were carried out to include more institutional variables in the analysis. Thus, the Rule of Law index, Political Instability index and Government Effectiveness index were included as three alternative specifications to account for other institutional factors as determinants of China's aid in non-reported analysis. However, the significance level and magnitude of other variables of interest changed considerably, giving somewhat different results and reduces the robustness of the results. This is because, these variables are highly correlated, hence, the exclusion from the reported estimation.

However, the three trade variables of interest that are used to determine whether China's aid is for economic motive such as, oil/minerals $(lnEXOILShr_{ij})$ agriculture $(lnEXAGRICShr_{ij})$ and manufacturing $(lnEXMANUShr_{ij})$ do not have any meaningful effects on aid in both the GLS and the Pesaran dynamic fixed effects regression results reported in Table 6.4 and Table 6.6 respectively. Whereas, only manufacturing is positive

and significant at 5 per cent level, with the magnitude of 0.116 in the FE with the robust standard error reported results in Table 6.5. Indicating that the effect of China's aid and China's manufacturing exports to African oil/minerals exporting countries is larger. That is, China's aid to Africa is tied to its exports, suggesting the importance of aid for enabling more exports from China. More importantly, it shows that oil/minerals and agriculture exports from China to Africa are not determinants of China's economic cooperation. The result conforms with *a prior* expectation and is inconsonant with Alesina and Dollar, (2000); Gunning (2005) economic rationale for giving aid.

In the case of mortality rate ($Mortalityrate_j$), the magnitude of the coefficient is -0.004, and it is negative and significant at 5 per cent level in the GLS results. Also, in the FE with robust standard error regression results, the magnitude of the coefficient of mortality rate is -0.029 and it is significant at 1 per cent level. Similarly, it is statistically negative and significant at 1 per cent level with -0.038 coefficients in the long-run Pesaran dynamic fixed effects results reported in Table 6.6. The inclusion of this variable is explained in Section 6.3.1. Therefore, the results for infant mortality rate supports *a prior* expectation with the significantly negative and stronger coefficients, which indicates that China as a donor cares less about improving the physical well-being of the oil/minerals exporting countries in Africa.

The degree of trade openness ($lnOPENSS_j$) variable in the FE with robust standard error regression results conform to *a prior* expectation. As the results show that the relationship between aid and trade openness is negative. In the FE results reported in Table 6.5, trade openness variable is significantly negative at 5 per cent level with -0.557 coefficients. To indicate that the less open an economy is, the less aid to expect from China. This indicates that China's aid negatively correlated with Africa's trade openness. However, in the Pesaran dynamic fixed effect regression results reported in Table 6.6, the

degree of openness variable has no significant effect in both the short-run and long-run on aid but has negative coefficients.

For the per capita GDP ($lnGDPperk_j$) results, the magnitude of the estimated coefficient is higher for the FE robust (1.6671) and strongly significant at 1 per cent as compared to the Pesaran dynamic fixed effects long-run results with the magnitude of 1.452 and significantly positive at 5 per cent level. While it is negative and significant at 1 per cent level in the Pesaran dynamic fixed effects regression short-run results with a coefficient of -3.719. Thus, the reported real per capita GDP in the FE robust and Pesaran dynamic fixed effects long-run results indicate that the recipient's country economic development determines or attracts more China's aid (Biggeri & Sanfilippo, 2009; Cao & Paltiel, 2015; Neumayer & Spess, 2005). On the other hand, the estimated short-run Pesaran dynamic fixed effects results indicate that a 1 per cent decrease in per capita GDP will lead to a decrease in China's aid by 3.719 per cent. In other words, China's aid is determined by the real per capita GDP of African oil/minerals exporting countries.

Lastly, reported results of GDP which is a measure of the size of the recipients' countries' market size, has a higher magnitude of 2.669 and is significantly positive at 5 per cent level in the Pesaran dynamic effects regression short-run results. Considering the results based on the importance of market size, the coefficients of GDP variable reported has a bigger magnitude. However, it is insignificant and negative in the other results reported. From the short run Pesaran dynamic effects regression results, it can be deduced that size of the recipient's economy, and China's aid conforms with the theoretical expectation on aid motive (Alesina & Dollar, 2000), even when this cannot be guaranteed in the long run. In other words, Chinese aid is more sensitive to proportional variations in market size of African oil/ minerals exporting countries.

6.5 Summary

Given the importance of foreign aid as a tool for creating public/private sectors enabling environment, many African countries have continued to embrace China's foreign aid due to its potentials to enhance economic growth and development, boost needed infrastructure and reduce poverty. However, several studies have argued back and forth on the determinants of Beijing's foreign aid to African countries. While some claim it is based on China's economic growth and political relevance, others believe China's foreign aid is determined mainly by altruism (Biggeri & Sanfilippo, 2009; Bräutigam, 2009, 2010, 2011b; Dreher et al., 2018; Fijałkowski, 2011; Renard, 2011; Zafar, 2007). Based on this background knowledge, the main purpose of this chapter is to empirically analyse the determinant of China's bilateral aid to 18 oil/minerals exporting African countries. In addition, the motive behind China's foreign aid to the countries under study was based on whether for altruism or for trade-benefits.

The analyses in this chapter are carried out with China's bilateral loan data obtainable from CARI; disaggregate HS products imports and exports data that is categorised into agriculture (1-24), oil/minerals (25-27) and manufacturing (28-99) obtainable from the UN-Comtrade database and other exploratory variables. In the trade disaggregate products data used, imports were used to examine altruism motive for giving aid while disaggregate products export data were used to analyse aid-for-economic-motive. Additionally, for meaningful economic cooperation, the role of the institutional structure of the recipient country becomes inevitable. Consequently, political instability index and control of corruption perception index obtainable from WGI were used to examine the quality of the institutional structure that determines meaningful bilateral cooperation between Africa and China.

Using pooled OLS, FE with robust standard error, GLS estimator and Pesaran dynamic fixed effects regression approach, the econometric results had surprisingly shown that oil/minerals are not the determinants of aid in the two specified equations (3.7 and 3.8). However, China's manufacturing export variable used to examine whether China's aid is for the economic benefit show that China exports are tied to aid, that is, manufacturing exports influences foreign aid to African oil/minerals exporting countries. Nonetheless, the reported results serve as a contribution to aid-for-economic-benefit literature and aid-for-altruism literature.

Moving away from the trade determinants, the findings on the quality of institutional structure put in place in the recipient country, proxy as political instability and control of corruption perception suggest that political instability and corruption increase China's foreign aid in Africa. The results on total debt and infant mortality rate show that they are important determinants in China bilateral aid considerations to Africa. In conclusion, the econometric estimators employed have shown that what determines China's foreign aid to oil/minerals exporting countries in Africa may in many ways related to what determines OECD DAC members aid to Africa.

CHAPTER 7: CONCLUSION, IMPLICATIONS AND LIMITATIONS

7.1 Introduction

In this chapter, the conclusion of the thesis which includes synthesising some of the important points discussed in previous chapters is presented. This is followed by the major findings of the empirical analyses on the determinants of China's economic engagements (vis-à-vis in trade, FDI and aid) with 18 oil/minerals exporting countries in Africa. Also discussed in this chapter are the policy implications of these findings, limitations of the study which point to areas of future research and summary end this chapter.

7.2 Conclusion

The major objective of this study is to examine the determinants of China's bilateral economic engagements with 18 oil/minerals exporting African countries. These economic engagements are divided into three major interrelated links which are trade, FDI and aid (economic cooperation). Thus, the three links, trade, FDI and aid represent the objectives of the study. The first objective is to examine the determinant of China's imports flows using a dynamic gravity model of trade. The second objective is divided into two sub-objectives; (i) to analyse the determinants of Chinese bilateral outward FDI stocks to African oil/minerals exporting countries, and (ii) to analyse the determinants of China's bilateral FDI flows to oil/minerals exporting countries in Africa using panel estimation and instrumental variables techniques. The third objective is to investigate the determinants of bilateral Chinese foreign aid with the motive of determining whether it is for altruism or for economic benefit.

To determine the macroeconomic links of Chinese bilateral economic engagements, the study adopts the twofold approach. First, the major links of economic engagements between China and Africa were identified from the theoretical and empirical literature.

Second, appropriate econometric techniques used to analyse the three identified links (trade, FDI and Aid) were adopted and modified from the empirical studies such as Biggeri and Sanfilippo (2009), Cheng and Ma (2010), De Grauwe et al. (2012), Edwards and Jenkins (2014), Foad (2011), Kolstad and Wiig (2011), Kolstad and Wiig (2012) and Neumayer and Spess (2005). However, most of these studies do not focus on Africa oil/minerals exporting economies solely. Rather previous studies tended to focus on individual countries, sub-Saharan Africa, the entire African continent and developed economies mixed with and developing economies. As well, the existing studies on oil and minerals endowed countries are mostly descriptive, with a focus on the political economy of Sino-African relations. The only specific econometric research focused on oil exporters is the study of Qian (2012) on the determinant of China's FDI to Africa, Middle East, Central-Asia, Russia and Latin America. This study fails to take into cognizance the different stages of economic development of the countries under study. In all these studies, disaggregate trade-by-country-products-year classified into agriculture, oil/minerals and manufacturing that will tend to address what determines the distribution China's trade, FDI and aid in the specific product(s) were less of importance to them. Furthermore, the uniqueness of this study is that political instability index and corruption perception index of the African countries were examined as the major institutional determinants in the three objectives.

From the inception of the theory of absolute advantage to Heckscher-Ohlin-Samuelson (HOS) theory of factor endowment (Evenett & Keller, 2002) to NTT to Dunning's eclectic analytical framework (Dunning, 1988) and other related trade and FDI theories, numerous efforts have been developed by economists to explain motives for international trade and foreign investments among countries globally. Of prominence are the classical economists that have developed several theories to justify reasons why countries engage in international trade and investment and further explain the benefits of bilateral economic

trade between and among countries. Other theorists claimed that foreign aid and trade have both direct and indirect linkages that invariably enlarge the donor country exports levels to the recipient country. They posit further that aid is the pioneering form of bilateral economic relations (Alesina & Dollar, 2002; Wagner, 2003).

Based on the literature, the determining factors of China imports from oil/minerals exporting countries in Africa were empirically examined using the gravity model of trade approach within the period of 1992-2015. Several studies carried out on Chinese economic engagement in Africa (Biggeri & Sanfilippo, 2009; De Grauwe et al., 2012), show that availability of markets and natural resources is an important trade consideration for China. Even when African exports to China results in large trade surpluses, few big commodity export countries run large trade deficits with China. Hence, some African countries endowed with resources have experienced spectacular rates of growth, while other countries have experienced shrinkage in real terms. On this premise, almost all the sampled countries rely heavily on oil/minerals exports, which represent well over 90 per cent of their total trade with China. In this study, GLS, PPML and bias-corrected Least Squares Dummy Variable (LSDVC) are the three approaches for estimation (apart from the pooled OLS and FE) employed to investigate the determinants of China's economic engagement with African oil/minerals exporting countries. The results indicate that agriculture marginally determines Chinese imports in the GLS estimator only. That means agriculture rarely affect China-Africa trade while, the two other imports variables, oil/minerals and manufacturing had maximum impacts in all the three estimation techniques. This suggests that oil/minerals are not the only factors driving China imports from Africa. Other variables that determine China's imports are GDP of country $i \; and \; j$, distance, the population of $i \; and \; j$, total land area and landlock. Also, the institutional structure of Africa is an important determinant of Chinese engagement in the region (Alden, 2012; Alden & Davies, 2006; Biggeri & Sanfilippo, 2009; Hu & Van Marrewijk,

2013; Zafar, 2007), as China is noted for trading and investing in countries with poor institutions. The results on the institutional structure as determinants are significantly negative, it displays the peculiarity of China engaging with less stable polity and less control of corruption economies.

The second objective focused on the determinants of China's foreign investment in 18 oil/minerals exporting African countries and the models were empirically examined using unbalance panel data techniques from 2000 to 2015. In the study, pooled OLS, RE regression and GLS estimator were employed. To solve endogeneity issues in the regressions, two (2) stage least squares (2SLS) and 2SLS (robust standard error) were further used to analyse the models. The dependent variable used was Chinese bilateral FDI outward stocks and Chinese bilateral FDI outflows to Africa while the independent variables include a share of agriculture imports, oil/minerals imports share, manufacturing imports share, GDP, inflation, school enrolment and political instability. The GLS results of the FDI stock model indicate that manufacturing and agriculture imports have fewer effects, while oil/minerals imports share is the major determinants of FDI. Although, manufacturing imports share is not significant in the 2SLS results, overall oil/minerals domiciled in the region enhance Chinese FDI stocks. On the other explanatory variables included in the FDI stock model, the results show that GDP, school enrolment (a proxy for human capital) and institutional structure (political instability) significantly affects FDI between China and Africa. The inadequate infrastructure among the African oil/minerals exporting countries deters FDI. Unlike the results of the Chinese bilateral FDI stocks, the empirical GLS results of the bilateral Chinese FDI outflows to African oil/minerals exporting nations shows the evidence of oil/minerals trade share as the only determinants of China's FDI flows. Although, the 2SLS regression results differ a little, with oil/minerals and manufacturing exports as the trade determinants. By and large, extractive sector and associated industries determine Chinese bilateral FDI. The

results are extremely consistent with the empirical studies of Drogendijk and Blomkvist (2013), Kolstad and Wiig (2011, 2012), Qian (2012), Ross (2015), Shan et al., (2018) that find natural resources as the drive for Chinese investment. Also, inflation, which is a form of economic stability, GDP and human capital influences positively, while, institutional structure proxy as political instability and control of corruption negatively increases Chinese bilateral FDI.

With respect to China's foreign aid, the dynamic Pesaran fixed effects, GLS, FE and POLS estimators were used to analyse the determinants of China's bilateral aid with African 18 oil/minerals exporting countries from the period of 2000-2015. In this study, the dependent variable used was China's bilateral loans to Africa, in which the secondary data were sourced from China Africa Research Initiative. The independent variables include total external debt, GDP, real per capita GDP, trade openness and mortality rate of recipient countries. In specific, the trade (imports and exports) variables are categorized oil/minerals share, manufacturing share and agriculture share for the 18 African oil/minerals exporting countries. China's imports were used to examine aid-for-altruism motive while China's exports were used to analyse aid-for-economic motive. The institutional structure variables used are political instability index and control of corruption perception index. From the discussion of the analyses, the GLS results of imports variables show that manufacturing and agriculture are the only determinants of Chinese aid while the dynamic Pesaran fixed effects results are significantly negative in the short-run and positive in the long-run. It indicates that aid is not tied to oil/minerals export share. Instead, agriculture exports and manufacturing export shares have more effects. In general, the results show that political stability, mortality rate and total debt negatively determines China's aid-for altruism. Accordingly, it can be concluded that the political instability of the recipient country and mortality rate of the African countries under study spur Chinese aid. Therefore, China's foreign aid is essential for

complementary capital sources for development. Also, as for the China aid-for-economic motive (exports) GLS estimator results, external debt, mortality rate and control of corruption index negatively determine aid to Africa. Also, FE and the dynamic Pesaran fixed effects results indicate that per capita GDP, GDP and trade openness determine China's motive for giving aid. However, in all the exports variables results, only manufacturing conforms to *a prior* expectation, as the effect of foreign aid and manufacturing exports are larger, suggesting the importance of China's manufacturing exports in enabling more aid to Africa. In other words, China's aid is determined by an economic motive.

7.3 Policy Implications

As stated earlier, the general objective of this study is to examine the determinants of China's bilateral trade, FDI and aid to 18 oil/minerals exporting African countries. Based on objective one (1), GLS, PPML and LSDVC were employed in the gravity model of trade. For objective two (2) the panel data techniques employed to answer the FDI models were GLS and 2SLS (with robust standard error). The third (3) objective which are the aid models used unbalanced panel data techniques and employed GLS, FE (with robust standard error) and the dynamic Pesaran fixed effects estimators to analyse the models. The results on the trade and FDI models confirm the importance of oil/minerals as determinants of China's engagement with Africa. On the other hand, the results of aid indicate that manufacturing and agriculture determine China's bilateral aid to Africa. Based on the empirical findings, several policy issues can be highlighted, and policy recommendation developed.

The main motive for bilateral economic engagement between China and Africa is to promote economic cooperation that will boost economic growth in the oil/minerals exporting countries. Therefore, the argument surrounding China-Africa win-win or win-

lose relations will continue if their pattern of ties, particularly trade, follows the static 'Ricardian theory' of comparative advantages. Because the New trade theory will be applicable if and only when Africa attains the same economic development status as China. H-O-S relative factor endowments of resources, labour and capital where Africa economies concentrate on natural resources exports in which they have comparative advantages over China or the other traditional trading partners such as USA, EU and other South-South alliance regions that have comparative advantages in various manufacturing goods. Hence, oil/minerals exporting African countries should, as a matter of urgency, diversify their economies in order not to remain on the peripheral level of dependency theory, which is disadvantageous to their long-run goal of industrialisation and economic development. For this to manifest, fundamental and structural policy reforms on trade must be revisited to achieve desirable results of more exports and more FDI in all the three trading sectors. As well African government should be more specific on its agenda to achieve a realistic trade boost, reactivate and ensure China create more industrial free trade zones in Africa.

Another important finding from the determinants of bilateral economic engagement between China and African oil/minerals exporting countries show the need to expose the economies more to international trade. To solve this challenge, more efficient trade relations between China and Africa and between Africa and its global trade partner that is capable of changing Africans vision of becoming less dependent on natural resources exports to an industrialised economy with less poverty from the region becomes inevitable. Then, China as one of the leading global economies should also be encouraged to become one of the major trading partners, joint-ventures and include Africa in its global value chain. To achieve this, oil/minerals exporting African countries need to open more of their economies to encourage and stimulate better bilateral China-Africa relations; and there should be the removal of tariffs and non-tariff barriers on some agricultural and

manufacturing goods. Also, the government should implement trade policies to strengthen exports and above all, provide enabling environment, with required infrastructure befitting for this millennium. These methods backed with strong institutional structures will showcase the nations' semi-manufacturing and manufacturing strength besides the oil/minerals export.

Furthermore, the research findings on FDI also indicates that Chinese investment in African oil/minerals exporting countries support multinational enterprises (Dunning, 1988) and the internationalisation process of firm theories. Therefore, governments need to formulate and implement macroeconomic policies that will attract more investors and create an enabling environment conducive to effectively promote both domestic and foreign investments (public and private) that will bring in new technology and provide capital to foster economic development in all sectors. More importantly, African governments need to introduce a few policies to enhance human capital development which will make their citizens benefit from China's appended interest in the region. The study also recommends that oil/minerals exporting African countries' leaders should maintain political stability, reduce the level of corruption, uphold and strengthen other institutional structures to reinforce foreign investors' confidence in the region.

From the empirical findings on the determinants of Chinese bilateral FDI and aid, African oil/minerals exporting countries should maximise Chinese appended interest in their resources and converse for more infrastructure development that is grossly deficient in most of the oil/minerals endowed African states. More infrastructure development can be achieved from China if Africa requests for the 'Angolan Model' of development, that is, oil-for-infrastructure or oil-as-a-concession-for-infrastructure exchange plan (Gold et al., 2017). Also, the quality of the institutional structures of the African countries under study serves as determinants of their economic relations with China and the rest of the

world in the analyses. Therefore, Africa as a region should advocate for a sound institutional structure which includes; reduction in the incidence of corruption, proper government accountability, the effective rule of law, better government effectiveness, political stability and good regulatory quality that will bring the desired economic growth and development.

Another finding from the empirical results on determinants of China's aid leads to the conclusion that detail knowledge of the specific trade-by-country-product that determines China's bilateral foreign aid will enable African countries under study to position themselves effectively towards global markets and improve better the aid-trade link. Lastly, for more effective economic cooperation between China and Africa that is capable of changing Africans vision of becoming less dependent on aid, to industrialised economies with higher GDP per capita and less poverty. Then, the words of the Chinese ambassador to Malawi quoted in Bräutigam (2010), as 'globally, no nation develops through foreign aid… developing your country is your responsibility… you have to do it yourself' should be the watchwords that will prompt Africa to develop to the admiration of the world with or without foreign aid. On the other hand, if Africa must rely on foreign aid for its infrastructure development, then, the government must negotiate for appropriate configuration of aid for that purpose. Also, other components of development assistance such as the inflexible exchange rate regime and low inflation rate, which are elements of macroeconomic balance policy should be improved to allow for more aid effectiveness and partnership between donors and recipients.

7.4 Limitations of the Study

On the trade model, the major limitation is lack of trade data or several cases of missing country data. The missing trade data arose from the large differences regarding oil discovery period of some African oil/minerals exporting countries and internal political

unrest that led to either total breakup of the nation and subsequent missing data during the unrest periods that leads to their exclusion from the study despite their trade relations with China. This is the case of Sudan, South Sudan, Zimbabwe and the Niger Republic that are major Chinese partner in trade and investment. Furthermore, bilateral Chinese FDI stocks and flows data that conform to the global standard are not available before the year 2000. Hence, the total FDI bilateral stocks and flows data from the period of 2000 are adopted, and this situation has limited the precision and the duration of this study. Similarly, data on bilateral Chinese aid/financial flows to Africa were never in existence or totally missing before the year 2000 and the only available comprehensive aid data adopted is sourced from CARI.

Also, based on the issue of missing/incomplete data and short data duration, time series analysis is not available to be carried out in each African oil/minerals exporting countries. It is believed that the impact of each variable varies from each African nation and therefore, the results of the econometric analysis for the 18 African oil/minerals exporting countries are relatively general.

7.5 Suggestions for Future Research

It is worth mentioning that China and individual African nations' relations may be too soon to measure considering the period of engagement, especially in comparison with Africa's traditional partners such as USA, EU, UK and other South-South alliance countries. This is because time series econometric analysis for each country is impossible to be carried out due to limited data. One would not fail to observe that most Sino-Africa individual studies are mainly qualitative. Therefore, when a longer period of data is available, such econometric study can be carried out in each country, and each explanatory variable impact would vary for the individual nation.

Further empirical research can be extended to Middle East oil nations and African oil nations (including Niger, Sudan, South Sudan and Zimbabwe that were left out in this study, to give a more representation for African oil/minerals exporting countries as a group), and to analyse and compare if determinants of Chinese bilateral engagements vis-a-via trade, FDI and aid are similar in the two major oil-exporting regions.

Also, the role of financial institutions or the financial sector in enabling trade and facilitating foreign investments need rigorous research, hence, are left for further studies. Lastly, the controversy surrounding flows of people especially labour and environmental consequence of China's engagement with oil/minerals exporting countries needs rigorous research.

7.6 Summary

This study has conducted an empirical analysis of the determinants of China's bilateral economic engagement with oil/minerals exporting countries in Africa. In all, the empirical analysis showed important and robust results in achieving the stated objectives of the study. The results highlight the fundamental significance of the existence of links among the three channels; trade, FDI and aid as described in the theoretical and empirical background. In conclusion, this chapter summarises the entire thesis. It presents policy implications of the findings, recommendations, limitation of the study and suggestion for future research.

REFERENCES

Adam, S. (1776). *An Inquiry into the Nature and Causes of the Wealth of Nations Edwin Cannan's annotated edition* Retrieved from http://ejpe.org/pdf/5-2-art-3.pdf.

Ado, A., & Su, Z. (2014). *Myths and Reality of the Chinese Investments in Africa: A*n Analytical Literature Review.

Agbodji, A. E. (2008). The Impact of Sub-regional Integration on Bilateral Trade: The Case of UEMOA. *African Economic Research Consortium, Nairobi, AERC Research Paper 186*.

Aguilar, R., & Goldstein, A. (2009). The Chinisation of Africa: The Case of Angola. *World Economy, 32*(11), 1543-1562. doi: 10.1111/j.1467-9701.2009.01249.x

Ajakaiye, O. (2006). China and Africa: opportunities and challenges: AERC Scoping Studies on China-Africa Economic Relations. Working Paper. Nairobi: African Economic Research Consortium.

Alabi, O. G., Adetunji, B. M., & Ogunkola, E. O. (2011). An analysis of China-Nigeria investment relations. *Journal of Chinese Economic and Foreign Trade Studies, 4*(3), 183-199. doi: 10.1108/17544401111178221.

Alden, C. (2005). China in Africa. *Survival, 47*(3), 147-164. doi: 10.1080/00396330500248086

Alden, C. (2012). China and Africa: A Distant Mirror of Latin America. *China y África: un espejo distante para América Latina* (75), 19-47.

Alden, C. (2012). China and Africa: The Relationship Matures. *Strategic Analysis, 36*(5), 701-707. doi: 10.1080/09700161.2012.712365

Alden, C., & Davies, M. (2006). A profile of the operations of Chinese multinationals in Africa. *South African journal of international affairs, 13*(1), 83-96.

Alesina, A., & Dollar, D. (2000). Who gives foreign aid to whom and why? *Journal of economic growth, 5*(1), 33-63.

Anderson, J. E., & Marcouiller, D. (2002). Insecurity and the pattern of trade: An empirical investigation. *Review of Economics and Statistics, 84*(2), 342-352.

Anderson, J. E., & van Wincoop, E. (2003). Gravity with Gravitas: A Solution to the Border Puzzle, American Economic Review. *March, 93*(1), 170.

Anderson, T. W., & Hsiao, C. (1981). Estimation of dynamic models with error components. *Journal of the American Statistical Association, 76*(375), 598-606. doi: 10.2307/2287517

Anderson, T. W., & Hsiao, C. (1982). Formulation and estimation of dynamic models using panel data. *Journal of Econometrics, 18*(1), 47-82. doi: 10.1016/0304-4076(82)90095-1

Anwar, S., & Nguyen, L. P. (2011). Foreign direct investment and trade: The case of Vietnam. *Research in International Business and Finance, 25*(1), 39-52. doi: 10.1016/j.ribaf.2010.05.004

Anyanwu, J. C. (2012). Why Does Foreign Direct Investment Go Where It Goes?: New Evidence From African Countries. *Annals of Economics & Finance, 13*(2).

Anyu, J. N., & Ifedi, J. P. A. (2008). China's Ventures in Africa: Patterns, Prospects, and Implications for Africa's Development. *Mediterranean Quarterly, 19*(4), 91-110. doi: ttps://doi.org/10.1215/10474552-2008-027

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies, 58*(2), 277-297.

Emmanuel, A. (1972). *Unequal exchange: A study of the imperialism of trade*: Monthly Review Press.

Armey, L. E., & McNab, R. M. (2018). Expenditure decentralization and natural resources. *The Quarterly Review of Economics and Finance, 70*, 52-61. doi: https://doi.org/10.1016/j.qref.2018.05.015

Arvanitis, A. (2005). Foreign Direct Investment in South Africa: Why Has It Been So Low? *Post-Apartheid South Africa: The First Ten Years*, 64-79.

Asiedu, E. (2002). On the Determinants of Foreign Direct Investment to Developing Countries: Is Africa Different? *World Development, 30*(1), 107-119. doi: 10.1016/s0305-750x(01)00100-0

Asiedu, E. (2006). Foreign Direct Investment in Africa: The Role of Natural Resources, Market Size, Government Policy, Institutions and Political Instability. *The World Economy, 29*(1), 63-77. doi: 10.1111/j.1467-9701.2006.00758.x

Assane, D., & Chiang, E. P. (2014). Trade, Structural Reform, and Institutions In Sub-Saharan Africa. *Contemporary Economic Policy, 32*(1), 20-29.

Athukorala, P.-c. (2012). Asian trade flows: Trends, patterns and prospects. *Japan and the World Economy, 24*(2), 150-162. doi: 10.1016/j.japwor.2012.01.003

Ayanwale, A. B. (2007). FDI and Economic Growth: Evidence from Nigeria. *African Economic Research Consortium, Nairobi, Paper 165*, 48.

Ayodele, T., & Sotola, O. (2014). China in Africa: An evaluation of Chinese investment. *Initiative for Public Policy Analysis (IPPA) Working Paper*, 1-20.

Bacchetta, P., & Van Wincoop, E. (2000). Does exchange-rate stability increase trade and welfare? *American Economic Review, 90*(5), 1093-1109.

Baier, S. L., & Bergstrand, J. H. (2007). Do free trade agreements actually increase members' international trade? *Journal of International Economics, 71*(1), 72-95. doi: 10.1016/j.jinteco.2006.02.005

Baldwin, R., & Taglioni, D. (2006). Gravity for dummies and dummies for gravity equations: National Bureau of Economic Research.

Baltagi, B. (2008). *Econometric analysis of panel data*: John Wiley & Sons.

Baltagi, B. H., Egger, P., & Pfaffermayr, M. (2003). A generalized design for bilateral trade flow models. *Economics Letters, 80*(3), 391-397.

Baltagi, B. H., & Kao, C. (2001). Nonstationary panels, cointegration in panels and dynamic panels: A survey *Nonstationary panels, panel cointegration, and dynamic panels* (Vol. Center for Policy Research. 136., pp. 7-51): Emerald Group Publishing Limited.

Barro, R. J., & Sala-i-Martin, X. (1997). Technological diffusion, convergence, and growth. *Journal of economic growth, 2*(1), 1-26.

Beck, N. (2001). Time-series–cross-section data: What have we learned in the past few years? *Annual review of political science, 4*(1), 271-293.

Beck, N., & Katz, J. N. (1995). What to do (and not to do) with time-series cross-section data. *American political science review, 89*(3), 634-647.

Besada, H., Wang, Y., & Whalley, J. (2008). China's growing economic activity in Africa: World Scientific.

Bhattacharya, A., Montiel, P. J., & Sharma, S. (1997). How can Sub-Saharan Africa attract more private capital inflows? *Finance and development, 34*(2), 3.

Biggeri, M., & Sanfilippo, M. (2009). Understanding China's move into Africa: an empirical analysis. *Journal of Chinese Economic and Business Studies, 7*(1), 31-54. doi: 10.1080/14765280802604714

Bing, J. H., & Ceccoli, S. J. (2013). Contending narratives in China's African development. *Journal of Third World Studies, 30*(2), 107-136.

Blackburne, E. F., & Frank, M. W. (2007). Estimation of nonstationary heterogeneous panels. *Stata Journal, 7*(2), 197.

Blomqvist, H. (1994). Determination of Bilateral Trade Flows in East Asia: A Gravity Approach. *Economic Reform, Liberalisation and Trade in the Asia-Pacific Region. New Delhi: Wiley Eastern*.

Blonigen, B. A., & Wang, M. (2004). Inappropriate pooling of wealthy and poor countries in empirical FDI studies (Vol. NBER Working Paper No. 10378): National Bureau of Economic Research.

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics, 87*(1), 115-143.

Borensztein, E., De Gregorio, J., & Lee, J.-W. (1998). How does foreign direct investment affect economic growth? *Journal of International Economics, 45*(1), 115-135. doi: 10.1016/S0022-1996(97)00033-0

Bosshard, P. (2008). China's environmental footprint in Africa: SAIS Working Papers in African Studies, 01-08. Washington: Johns Hopkins University School of Advanced International Studies.

Bouare, O. (2008). Factor Endowments and Increasing Returns to Scale as Upstream Theories of Comparative Cost Advantage are Inadequate for Explaining International Trade. Rochester: Social Science Research Network.

Bowden, R. J., & Turkington, D. A. (1984). Instrumental variables, econometric society monograph in quantitative economics: Cambridge University Press.

Brada, J. C., & Mendez, J. A. (1983). Regional economic integration and the volume of intra-regional trade: a comparison of developed and developing country experience. *Kyklos, 36*(4), 589-603.

Bräutigam, D. (2009). *The dragon's gift: the real story of China in Africa*: Oxford University Press.

Bräutigam, D. (2010). *China, Africa and the international aid architecture* (Vol. 107): African Development Bank Tunis, Tunisia.

Bräutigam, D. (2011a). Aid 'With Chinese Characteristics': Chinese Foreign Aid and Development Finance Meet the OECD-DAC Aid Regime. *Journal of international development, 23*(5), 752-764. doi: 10.1002/jid.1798

Bräutigam, D. (2011b). Chinese Development Aid in Africa: What, where, why, and how much? In: J. Golley and L. Song (eds), *Rising China: Global Challenges and Opportunities*. Canberra: Australian National University Press, pp. 203-222.

Bräutigam, D., & Jyhjong, H. (2016). "Eastern Promises: New Data on Chinese Loans in Africa, 2000 to2014," CARI Working Paper #4. *China Africa Research Initiative, Johns Hopkins University School of Advanced International Studies, Washington DC: CARI*.

Bräutigam, D., & Xiaoyang, T. (2011). African Shenzhen: China's special economic zones in Africa. *The Journal of Modern African Studies, 49*(1), 27-54. doi: 10.1017/S0022278X10000649

Broich, T., & Szirmai, A. (2014). China's economic embrace of Africa: An international comparative perspective: *MERIT Working Paper* No 49. United Nations University-Maastricht Economic and Social Research Institute on Innovation and Technology (MERIT).

Bruno, G. (2005). *Estimation and inference in dynamic unbalanced panel data models with a small number of individuals* (Vol. WP n. 165): Università commerciale Luigi Bocconi.

Buckley, P. J., & Casson, M. (1976). *The future of the multinational enterprise* (Vol. 1): Macmillan London.

Buckley, P. J., Clegg, L. J., Cross, A. R., Liu, X., Voss, H., & Zheng, P. (2007). The determinants of Chinese outward foreign direct investment. *Journal of International Business Studies, 38*(4), 499-518. doi: 10.1057/palgrave.jibs.8400277

Bun, M., & Klaassen, F. (2002). The importance of dynamics in panel gravity models of trade. *Amsterdam: Department of Quantitative Economics., (UvA Econometrics Discussion Paper; No. 2002/18).*

Burger, M., Van Oort, F., & Linders, G.-J. (2009). On the specification of the gravity model of trade: zeros, excess zeros and zero-inflated estimation. *Spatial Economic Analysis, 4*(2), 167-190.

Büthe, T., & Milner, H. V. (2008). The Politics of Foreign Direct Investment into Developing Countries: Increasing FDI through International Trade Agreements? *American Journal of Political Science, 52*(4), 741-762. doi: 10.1111/j.1540-5907.2008.00340.x

Calì, M., & te Velde, D. W. (2011). Does Aid for Trade Really Improve Trade Performance? *World Development, 39*(5), 725-740. doi: http://dx.doi.org/10.1016/j.worlddev.2010.09.018

Cao, H., & Paltiel, J. (2015). *Facing China as a New Global Superpower: Domestic and International Dynamics from a Multidisciplinary Angle*: Springer.

Carmody, P. (2009). An Asian-Driven Economic Recovery in Africa? The Zambian Case. *World Development, 37*(7), 1197-1207. doi: 10.1016/j.worlddev.2008.12.002

Carmody, P. R., & Owusu, F. Y. (2007). Competing hegemons? Chinese versus American geo-economic strategies in Africa. *Political Geography, 26*(5), 504-524. doi: org/10.1016/j.polgeo.2007.03.005

Carrere, C. (2006). Revisiting the effects of regional trade agreements on trade flows with proper specification of the gravity model. *European economic review, 50*(2), 223-247.

Caves, R. E. (1974). Multinational firms, competition, and productivity in host-country markets. *Economica, 41*(162), 176-193.

Chen, W., Dollar, D., & Tang, H. (2016). Why is China investing in Africa? Evidence from the firm level. *The World Bank Economic Review, 32*(3), 610-632.

Cheng, L. K., & Ma, Z. (2010). China's outward foreign direct investment *China's Growing Role in World Trade* (pp. 545-578): University of Chicago Press.

Cheong, K. C. (2009). China, Southeast Asia and the Global Economy: An Update. In E. K.-K. Yeoh (Ed.), *Regional Political Economy of China Ascendant* (pp. 19-26): University of Malaya.

Cheru, F., & Obi, C. (2011). Chinese and Indian engagement in Africa: Competitive or mutually reinforcing strategies? *Journal of International Affairs, 64*(2), 91-XV.

Cheung, Y.-W., de Haan, J., Qian, X., & Yu, S. (2012). China's Outward Direct Investment in Africa. *Review of International Economics, 20*(2), 201-220. doi: 10.1111/j.1467-9396.2012.01017.x

Cheung, Y. W., & Qian, X. W. (2009). Empirics of China's outward direct investment. *Pacific Economic Review, 14*(3), 312-341. doi: 10.1111/j.1468-0106.2009.00451.x

China's Information Office of the State Council white paper on China's foreign aid (July 2014). *China's Foreign Aid*. *Beijing, China*: Information Office of the State Council, The People's Republic of China.

China Daily (2015). *Sino-Nigeria's relationship: A New Beginning, A New Marriage.* Retrieved from <http://www.chinadaily.com.cn/world/africa.html>.

China's Facts and Figures (2002). Retrieved from <http://www.fmprc.gov.cn/mfa_eng/topics_665678/3705_665974/>.

Chipaike, R., & Bischoff, P. H. (2018). A Challenge to Conventional Wisdom: Locating Agency in Angola's and Ghana's Economic Engagements with China. *Journal of Asian and African Studies, 53*(7), 1002-1017. doi: https://doi.org/10.1177/0021909618763922

Condon, M. (2012). China in Africa: What the Policy of Nonintervention Adds to the Western Development Dilemma.

Corden, W. M. (1984). Booming sector and Dutch disease economics: survey and consolidation. *Oxford Economic Papers, 36*(3), 359-380.

Costantini, J., & Melitz, M. (2008). The dynamics of firm-level adjustment to trade liberalization. *The organization of firms in a global economy, 4*, 107-141.

Dannreuther, R. (2010). International relations theories: Energy, minerals and conflict. *Polinares EU Policy on Natural Resources. Polinares Working Paper* (8).

Davies, M. (2008). China's Developmental Model Comes to Africa. *Review of African Political Economy, 35*(115), 134-137. doi: 10.1080/03056240802021450

De Benedictis, L., & Taglioni, D. (2011). The gravity model in international trade; *The trade impact of European Union preferential policies* (pp. 55-89): Springer.

De Benedictis, L., & Vicarelli, C. (2005). Trade potentials in gravity panel data models. *The BE Journal of Economic Analysis & Policy, 5*(1).

De Grauwe, P., Houssa, R., & Piccillo, G. (2012). African trade dynamics: is China a different trading partner? *Journal of Chinese Economic and Business Studies, 10*(1), 15-45. doi: 10.1080/14765284.2012.638460

Deardoff, A. (2005). *Gains from trade and fragmentation.* Paper presented at the Research seminar in international economics, The University of Michigan, Ann Arbor, Michigan.

Deardorff, A. V. (1998). Fragmentation in Simple Trade Models, University of Michigan, School of Public Policy, Research Seminar in International Economics: Discussion Paper.

Devadason, E. S., & Govindaraju, V. C. (2014). China-Africa Trade and Investment Relations: Whither South-South Cooperation? *Available at SSRN 2400907*.

Dollar, D., & Kraay, A. (2003). Institutions, trade, and growth. *Journal of Monetary Economics, 50*(1), 133-162. doi: 10.1016/S0304-3932(02)00206-4

Downs, E. S. (2007). The Fact and Fiction of Sino-African Energy Relations. *China Security, 3*(3), 42-68.

Dreger, C., & Herzer, D. (2013). A further examination of the export-led growth hypothesis. *Empirical Economics, 45*(1), 39-60. doi: 10.1007/s00181-012-0602-4

Dreher, A., Fuchs, A., Parks, B., Strange, A. M., & Tierney, M. J. (2018). Apples and dragon fruits: the determinants of aid and other forms of state financing from China to Africa. *International Studies Quarterly, 62*(1), 182-194.

Drogendijk, R., & Blomkvist, K. (2013). Drivers and motives for Chinese outward foreign direct investments in Africa. *Journal of African Business, 14*(2), 75-84.

Dunning, J. H. (1988). The eclectic paradigm of international production: a restatement and some possible extensions. *Journal of international business studies*, 1-31.

Dupasquier, C., & Osakwe, P. N. (2006). Foreign direct investment in Africa: Performance, challenges, and responsibilities. *Journal of Asian Economics, 17*(2), 241-260. doi: 10.1016/j.asieco.2005.07.002

Edwards, L., & Jenkins, R. (2014). The margins of export competition: A new approach to evaluating the impact of China on South African exports to Sub-Saharan Africa. *Journal of Policy Modeling, 36, Supplement 1*(0), S132-S150. doi: org/0.1016/j.jpolmod.2013.10.003

Egbula, M., & Zheng, Q. (2011). China and Nigeria: a powerful South-South alliance. *West African Challenges, 5*, 1-20.

Eisenman, J. (2012). China–Africa Trade Patterns: causes and consequences. *Journal of Contemporary China, 21*(77), 793-810. doi: 10.1080/10670564.2012.684964

Embong, A. R. (2013). Responding to Globalization and the State: Negotiations and Contestations by the Middle Class in Malaysia. *Globalization and Social Transformation in the Asia-Pacific: The Australian and Malaysian Experience, Houndmills: Palgrave Macmillan*, 63.

Erten, B. (2010). *Uneven development and the terms of trade: A theoretical and empirical analysis.* (3427523 PhD), University of Massachusetts Amherst, Ann Arbor. Retrieved from <http://search.proquest.com/docview/814800213?accountid=28930 ABI/INFORM Complete database>.

Evenett, S. J., & Keller, W. (2002). On theories explaining the success of the gravity equation. *the Journal of political economy, 110*(2), 281-316. doi: 10.1086/338746

Feenstra, R. C. (2002). Border effects and the gravity equation: consistent methods for estimation. *Scottish Journal of Political Economy, 49*, 491-506.

Feenstra, R. C., Markusen, J. R., & Rose, A. K. (2001). Using the gravity equation to differentiate among alternative theories of trade. *Canadian Journal of Economics*, 430-447.

Feng, G., & Mu, X. (2010). Cultural challenges to Chinese oil companies in Africa and their strategies. *Energy Policy, 38*(11), 7250-7256. doi: 10.1016/j.enpol.2010.08.001

Fidrmuc, J. (2009). Gravity models in integrated panels. *Empirical Economics, 37*(2), 435-446. doi: 10.1007/s00181-008-0239-5

Fielding, D., & Gibson, F. (2013). Aid and Dutch Disease in Sub-Saharan Africa. *Journal of African Economies, 22*(1), 1-21. doi: 10.1093/jae/ejs013

Fijałkowski, Ł. (2011). China's 'soft power' in Africa? *Journal of Contemporary African Studies, 29*(2), 223-232. doi: 10.1080/02589001.2011.555197

Flannery, M. J., & Hankins, K. W. (2013). Estimating dynamic panel models in corporate finance. *Journal of Corporate Finance, 19*, 1-19. doi: 10.1016/j.jcorpfin.2012.09.004

Foad, H. (2011). China's Trade with Africa and the Middle East: A Tale of Markets, Politics, and Resources. *Politics, and Resources (August 9, 2011)*.

Fosu, A. K. (2011). *Terms of trade and growth of resource economies: A tale of two countries*: Working paper//World Institute for Development Economics Research, WIDER, Helsinki.

Frankel, J., Stein, E., & Wei, S.-J. (1995). Trading blocs and the Americas: The natural, the unnatural, and the super-natural. *Journal of Development Economics, 47*(1), 61-95.

Gamula, G. E., Hui, L., & Peng, W. (2013). Development of renewable energy technologies in Malawi. *International Journal of Renewable Energy Technology Research, 2*(2), 44 - 52.

Gani, A., & Chand Prasad, B. (2008). The relationship between institutional quality and trade in Pacific Island countries. *Journal of International Trade Law and Policy, 7*(2), 123-138. doi: 10.1108/14770020810927327

Gelb, A. H. (1988). *Oil Windfalls: Blessing or curse?*: Oxford university press.

Ghosh, S., & Yamarik, S. (2004). Are regional trading arrangements trade creating?: An application of extreme bounds analysis. *Journal of International Economics, 63*(2), 369-395.

Gil-Pareja, S., Llorca-Vivero, R., & Martínez-Serrano, J. A. (2008). Trade effects of monetary agreements: evidence for OECD countries. *European economic review, 52*(4), 733-755. doi: 10.1016/j.euroecorev.2007.04.002

Giovannetti, G., & Sanfilippo, M. (2009). Do Chinese Exports Crowd-out African Goods? An Econometric Analysis by Country and Sector. *The European Journal of Development Research, 21*(4), 506-530. doi: 10.1057/ejdr.2009.20

Gold, K. L., & Devadason, E. S. (2018). The Engagement of China in Nigeria's Oil Sector: Is the Transformation Positive? *Contemporary Chinese Political Economy and Strategic Relations: An International Journal, 4*(3), 1025-1060.

Gold, K. L., Rasiah, R., & Kwek, K. T. (2019). Econometric Analysis of the Determinants of China's FDI in Oil/Minerals Exporting Countries in Africa. *Journal of Applied Economic Sciences, XIV, Summer 2*(64).

Gold, K. L., Rajah, R., Kwek, K. T., Muhammad, M., & Yusuf, H. A. (2017). China's Aid and Oil-for-Infrastructure in Nigeria: Resource Driven or Development Motive? *Contemporary Chinese Political Economy and Strategic Relations: An International Journal, 3*(3), 1197-1235.

Goldstein, A., Pinaud, N., Reisen, H., & McCormick, D. (2009). The Asian Drivers and Africa: Learning from Case Studies. *World Economy, 32*(11), 1538-1542. doi: 10.1111/j.1467-9701.2009.01248.x

Gu, J. (2009). China's Private Enterprises in Africa and the Implications for African Development. *The European Journal of Development Research, 21*(4), 570-587. doi: 10.1057/ejdr.2009.21

Gujarati, D. N., & Porter, D. (2009). Basic Econometrics Mc Graw-Hill International Edition.

Gunning, J. W. (2005). Why Give Aid? *Development Aid: Why and How? Towards strategies for effectiveness*.

Hanson, S. (2008). China, Africa, and oil. *Council on Foreign Relations, 6*. Retrieved from <http://www.washingtonpost.com/wp-dyn/content/article/2008/06/09/AR2008060900714.html>.

Hanusch, M. (2012). African Perspectives on China–Africa: Modelling Popular Perceptions and their Economic and Political Determinants. *Oxford Development Studies, 40*(4), 492-516. doi: 10.1080/13600818.2012.728580

Haugen, H. Ø. (2011). Chinese Exports to Africa: Competition, Complementarity and Cooperation between Micro-Level Actors. *Forum for Development Studies, 38*(2), 157-176. doi: 10.1080/08039410.2011.572286

Hausman, J. A., & Taylor, W. E. (1981). A generalized specification test. *Economics Letters, 8*(3), 239-245.

Hayakawa, K., & Pesaran, M. H. (2015). Robust standard errors in transformed likelihood estimation of dynamic panel data models with cross-sectional heteroskedasticity. *Journal of Econometrics, 188*(1), 111-134.

Hayashi, F. (2000). Econometrics: Princeton University Press Princeton, NJ.

He, Y. (2013). Does China's trade expansion help African development? - an empirical estimation. *China Economic Review, 26*, 28-38. doi: 10.1016/j.chieco.2013.04.001

Heckman, J. J. (1979). Sample selection bias as a specification error. *Econometrica: Journal of the Econometric Society*, 153-161.

Heckscher, E. F., & Ohlin, B. G. (1991). *Heckscher-Ohlin trade theory*: The MIT Press.

Herbst, J., & Mills, G. (2009). Commodity Flux and China's Africa Strategy. *China Brief-The Jamestown Foundation, 9*(2).

Hilsum, L. (2008). China faces reality in Africa. *Review of African Political Economy, 35*(115), 137-140. doi: 10.1080/03056240802021468

Hirschman, E. C. (1980). Innovativeness, novelty seeking, and consumer creativity. *Journal of consumer research, 7*(3), 283-295.

Horowitz, J. L. (2001). The bootstrap *Handbook of Econometrics* (Vol. 5, pp. 3159-3228): Elsevier.

Hsiao, C. (2007). Panel data analysis—advantages and challenges. *The Wang Yanan Institute for Studies in Economics, Xiamen University, 16*(1), 1-22.

Hu, S., & Van Marrewijk, C. (2013). *An empirical analysis of the China-Africa Trade Puzzle: The role of China's trade policies*. Working Paper. Utrecht University.

Hurst, C. (2006). China's oil rush in Africa: Institute for the Analysis of Global Security: Washington DC. Retrieved from <*www.iags.org*>.

International Energy Agency (2016). *World Energy Outlook* (pp. 684 pages). Retrieved from http://www.iea.org/bookshop/720-World_Energy_Outlook_2016

Jauch, H. (2011). Chinese investments in Africa: Twenty-First Century Colonialism? *New Labor Forum (Sage Publications Inc.), 20*(2), 48-55. doi: 10.4179/NLF.202.0000008

Jenkins, R., & Edwards, C. (2006a). The Asian Drivers and Sub-Saharan Africa. *Ids Bulletin-Institute of Development Studies,* (*Asian drivers: Opportunities and threats*). Brighton, East Sussex: Institute of Development Studies, University of Sussex, *37*(1), 23-32. doi: 10.1111/j.1759-5436.2006.tb00244.x

Jenkins, R., & Edwards, C. (2006b). The economic impacts of China and India on sub-Saharan Africa: Trends and prospects. *Journal of Asian Economics, 17*(2), 207-225. doi: 10.1016/j.asieco.2006.02.002

Jian-Ye, W. (2007). *What Drives China's Growing Role in Africa? (EPub)*: International Monetary Fund.

Johanson, J., & Vahlne, J.-E. (1977). The Internationalization Process of the Firm—A Model of Knowledge Development and Increasing Foreign Market Commitments. *Journal of international business studies, 8*(1), 23-32. doi: 10.1057/palgrave.jibs.8490676

Johnston, L. A., Morgan, S. L., & Wang, Y. (2015). The gravity of China's African export promise. *The World Economy, 38*(6), 913-934.

Jones, R. W. (1956). Factor proportions and the Heckscher-Ohlin theorem. *The Review of Economic Studies*, 1-10.

Judson, R. A., & Owen, A. L. (1999). Estimating dynamic panel data models: a guide for macroeconomists. *Economics Letters, 65*(1), 9-15.

Jugurnath, B., Stewart, M., & Brooks, R. (2007). Asia/Pacific regional trade agreements: an empirical study. *Journal of Asian Economics, 18*(6), 974-987.

Kamara, Y. U. (2013). *Foreign Direct Investment and Growth in Sub-Saharan Africa What are the Channels?* (PhD Draft), University of Kansas. Retrieved from http://www2.ku.edu/~econ/people/documents/Kamara_2013_000.pdf.

Kantar, Y. M. (2015). Generalized least squares and weighted least squares estimation methods for distributional parameters. *REVSTAT—Stat. J, 13*, 263-282.

Kaplinsky, R. (2009). China and the terms of trade: The challenge to development strategy in Sub-Saharan Africa *Global Giant* (pp. 115-134): Springer.

Kaplinsky, R. (2013). What Contribution Can China Make to Inclusive Growth in Sub-Saharan Africa? *Development and Change, 44*(6), 1295-1316. doi: 10.1111/dech.12059

Kaplinsky, R., & Morris, M. (2009). Chinese FDI in Sub-Saharan Africa: Engaging with Large Dragons. *European Journal of Development Research, 21*(4), 551-569. doi: 10.1057/ejdr.2009.24

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2010). The Worldwide Governance Indicators: Methodology and Analytical Issues (World Bank Policy Research Working Paper No. 5430). *Washington, DC: The World Bank*.

Kelley, J. (2012). China in Africa: Curing the resource curse with infrastructure and modernisation. *Sustainable Development Law & Policy, 12*(3), 35-60.

Kemp, M. C. (1964). 77ie Pure Theory of International Trade: Englewood Cliffs: Prentice-Hall, Inc.

Kepaptsoglou, K., Karlaftis, M. G., & Tsamboulas, D. (2010). The gravity model specification for modelling international trade flows and free trade agreement effects: a 10-year review of empirical studies. *The open economics journal, 3*(1).

Kishi, R., & Raleigh, C. (2015). Chinese Official Finance and Africa's Pariah States: ACLED Working Paper Series.

Kiviet, J. F. (1995). On bias, inconsistency, and efficiency of various estimators in dynamic panel data models. *Journal of Econometrics, 68*(1), 53-78.

Kiviet, J. F., Phillips, G. D., & Schipp, B. (1999). Alternative bias approximations in first-order dynamic reduced form models. *Journal of Economic Dynamics and Control, 23*(7), 909-928.

Kobayashi, T. (2013). China: From an aid recipient to an emerging major donor *Aid as Handmaiden for the Development of Institutions* (pp. 35). Basingstoke: Palgrave Macmillan.

Kolstad, I., & Wiig, A. (2011). Better the Devil You Know? Chinese Foreign Direct Investment in Africa. *Journal of African Business, 12*(1), 31-50. doi: 10.1080/1536710x.2011.555259

Kolstad, I., & Wiig, A. (2012). What determines Chinese outward FDI? *Journal of World Business, 47*(1), 26-34. doi: 10.1016/j.jwb.2010.10.017

Kragelund, P. (2008). The return of Non-DAC donors to Africa: New prospects for African development? *Development Policy Review, 26*(5), 555-584.

Kragelund, P. (2009). Knocking on a Wide-open Door: Chinese Investments in Africa. *Review of African Political Economy, 36*(122), 479-497. doi: 10.1080/03056240903346111

Krugman, P. (1999). Was it all in Olin: Mimeo, MIT http://web? mit. edu/krugman/www/ohlin. html.

Krugman, P., & Obstfeld, M. (2009). International Economics: Theory and Practice, 8th Edition: Pearson Addison Wesley.

Krugman, P. R., & Obstfeld, M. (2000). Theory and Policy: New York: Published by Addison Wesley.

Kutner, M. H., Nachtsheim, C., & Neter, J. (2004). *Applied linear regression models*: McGraw-Hill/Irwin.

Lane, P. R., & Milesi-Ferretti, G. M. (2002). External wealth, the trade balance, and the real exchange rate. *European economic review, 46*(6), 1049-1071.

Lemi, A., & Asefa, S. (2001). *Foreign direct investment and uncertainty: The case of African economies.* Paper presented at the Proceedings of the International Business and Economics Research Conference.

Leontief, W. (1953). Domestic production and foreign trade; the American capital position re-examined. *Proceedings of the American Philosophical Society*, 332-349.

Levine, R. (2005). Finance and Growth: Theory and Evidence. *Handbook of economic growth, 1*, 865-934. doi: 10.1016/S1574-0684(05)01012-9

Li, R., & Cheong, K. C. (2019). "Going Out", Going Global, and the Belt and Road *China's State Enterprises* (pp. 151-194): Palgrave Macmillan, Singapore.

Linnemann, H. (1966). *An econometric study of international trade flows* (Vol. 234): North-Holland Publishing Company Amsterdam.

Lipsey, R. E. (2000). Affiliates of US and Japanese multinationals in East Asian production and trade *The Role of Foreign Direct Investment in East Asian Economic Development, NBER-EASE Volume 9* (pp. 147-189): University of Chicago Press.

Longo, R., & Sekkat, K. (2004). Economic obstacles to expanding intra-African trade. *World Development, 32*(8), 1309-1321. doi: 10.1016/j.worlddev.2004.02.006

Lubieniecka, E. R. (2014). Chinese Engagement in Sub-Saharan Africa: Can the Beijing Consensus be Explained Under World-Systems Analysis? *Fudan Journal of the Humanities and Social Sciences, 7*(3), 433-450. doi: 10.1007/s40647-014-0023-1

Luqman, O., Bakar, A., Aznin, N., Aziz, A., & Izraf, M. (2015). Regionalism and ECOWAS Trade Performance: A Gravity Model Approach. *Bogazici Journal: Review of Social, Economic & Administrative Studies, 29*(2).

MacDougall, G. D. A. (1960). The benefits and costs of private investment from abroad: A theoretical approach1. *Bulletin of the Oxford University Institute of Economics & Statistics, 22*(3), 189-211.

Magee, C. S. (2008). New measures of trade creation and trade diversion. *Journal of International Economics, 75*(2), 349-362. doi: 10.1016/j.jinteco.2008.03.006

Malpezzi, S. (2001). The contributions of Stephen K. Mayo to housing and urban economics. *Journal of Housing Economics, 10*(2), 72-108.

Maneschiöld, P.-O. (2008). A note on the export-led growth hypothesis: a time series approach. *Cuadernos de economía, 45*(132), 293-302. doi: 10.4067/S0717-68212008000200006

Markusen, J. R. (1995). The boundaries of multinational enterprises and the theory of international trade. *Journal of Economic Perspectives, 9*(2), 169-189.

Marques, H. (2008). The 'New' Economic Theories. Rochester: Social Science Research Network.

Martin, W., & Pham, C. (2008). Estimating the gravity model when zero trade flows are important. *World Bank. Mimeo*.

Martinez-Zarzoso, I., Felicitas, N.-L. D., & Horsewood, N. (2009). Are regional trading agreements beneficial?: Static and dynamic panel gravity models. *The North American Journal of Economics and Finance, 20*(1), 46-65.

Mátyás, L. (1997). Proper econometric specification of the gravity model. *The World Economy, 20*(3), 363-368.

Mawdsley, E. (2008). Fu Manchu versus Dr Livingstone in the Dark Continent? Representing China, Africa and the West in British broadsheet newspapers. *Political Geography, 27*(5), 509-529. doi: 10.1016/j.polgeo.2008.03.006

Mehlum, H., Moene, K., & Torvik, R. (2006). Institutions and the resource curse. *The Economic Journal, 116*(508), 1-20. doi: 10.1111/j.1468-0297.2006.01045.x

MOFCOM - Ministry of Commerce People's Republic of China (2017). *Retrieved from http://english.mofcom.gov.cn/column/links2011.shtml.*

Mohan, G. (2013). Beyond the Enclave: Towards a Critical Political Economy of China and Africa. *Development and Change, 44*(6), 1255-1272. doi: 10.1111/dech.12061

Moon, H. R., & Philips, P. (1999). Linear Regression Limit Theory for Nonstationary Panel Data. *Econometrics, 67*, 1057-1111.

Morgan, R. E., & Katsikeas, C. S. (1997). Theories of international trade, foreign direct investment and firm internationalization: a critique. *Management Decision, 35*(1), 68-78. doi: doi:10.1108/00251749710160214

Morisset, J. (2000). *Foreign direct investment in Africa: policies also matter* (Vol. 2481): World Bank Publications.

Moyo, D. (2012). Beijing, a boon for Africa. *The New York Times, 27*.

Mthembu-Salter, G. (2009). China's Engagement with the Nigerian Oil Sector. *Policy Briefing, 11*.

Muhammad, M., Buba, R., Azman, M. D., & Ahmed, A. (2019). China's involvement in the trans-Saharan textile trade and industry in Nigeria: the case of Kano. *Review of African Political Economy*, 1-9. doi: 10.1080/03056244.2019.1680356

Muhammad, M., Buba, R., Agboola, Y. H., & Gold, L. K. (2018). Nigerian Textile Industry: Evidence of Policy Neglect. *SARJANA, 33*(1), 40-56.

Muhammad, Murtala, M., Mansur, I. M., & Gold, K. L. (2017). The impact of Chinese textile imperialism on Nigeria's textile industry and trade: 1960–2015. *Review of African Political Economy, 44*(154), 673-682. doi: 10.1080/03056244.2017.1313729

Musibau, H. O., Yusuf, A. H., & Gold, K. L. (2019). Endogenous specification of foreign capital inflows, human capital development and economic growth: A study of pool mean group. *International Journal of Social Economics*, *46*(3), 454-475. doi: 10.1108/IJSE-04-2018-0168

Nayyar, D. (1978). Transnational Corporations and Manufactured Exports from Poor Countries. *The Economic Journal, 88*(349), 59-84. doi: 10.2307/2232014

Nayyar, D. (2007). *India's Exports and Export Policies in the 1960's* (Vol. 19): Cambridge University Press.

Nayyar, D. (2010). China, India, Brazil and South Africa in the World Economy: Engines of Growth? *Southern Engines of Global Growth, edited by Amelia Santos-Paulino and Guanghua Wan. Oxford: Oxford University Press, 1*, 9-27.

Nayyar, D. (2016). BRICS, developing countries and global governance. *Third World Quarterly, 37*(4), 575-591. doi: 10.1080/01436597.2015.1116365

Neter, J., Kutner, M. H., Nachtsheim, C. J., & Wasserman, W. (1996). *Applied linear statistical models* (Vol. 4): Irwin Chicago.

Neumayer, E. (2003). The determinants of aid allocation by regional multilateral development banks and United Nations agencies. *International Studies Quarterly, 47*(1), 101-122.

Neumayer, E., & Spess, L. (2005). Do bilateral investment treaties increase foreign direct investment to developing countries? *World Development, 33*(10), 1567-1585. doi: 10.1016/j.worlddev.2005.07.001

Nickell, S. (1981). Biases in dynamic models with fixed effects. *Econometrica: Journal of the Econometric Society*, 1417-1426. doi: 10.2307/1911408

Nissanke, M. (2013). Shifting Grounds in Aid Relationships and Effectiveness Debate: Implications for Economic Development in Sub-Saharan Africa *Aid as Handmaiden for the Development of Institutions* (pp. 48-80): Springer.

Nissanke, M., & Shimomura, Y. (2013). Institutional evolution through development cooperation: An overview. *Aid as handmaiden for the development of institutions: A new comparative perspective*, 1-47.

Nunnenkamp, P., & Spatz, J. (2003). Foreign direct investment and economic growth in developing countries: how relevant are host-country and industry characteristics?

Obi, C. I. (2008). Enter the Dragon? Chinese Oil Companies & Resistance in the Niger Delta. *Review of African Political Economy, 35*(117), 417-434. doi: 10.1080/03056240802411073

Ofodile, U. (2009). ireTrade, Aid and Human Rights: China's Africa Policy in Perspective. *Journal of International Commercial Law & Technology, 4*(2), 86-99.

Oguledo, V., & MacPhee, C. R. (1994). Gravity models: a reformulation and an application to discriminatory trade arrangements. *Applied Economics, 26*(2), 107-120.

Ogunkola, E. O., Adewuyi, A., Oyeranti, O., & Bankole, A. (2008). Nigeria-China trade and economic relations. *Centre for Trade and Development Initiatives*, 1-1.

Ogunkola, E. O., Bankole, A. S., & Adewuyi, A. (2008). China-Nigeria Economic Relations: AERC Scoping Studies on China–Africa Relations. *Nairobi: AERC (mimeo)*.

Olofin, S., Salisu, A., Ademuyiwa, I., & Owuru, J. (2014). Determinants of a Successful Regional Trade Agreement in West Africa. In D. Seck (Ed.), *Regional Economic Integration in West Africa* (pp. 181-211): Springer International Publishing.

Onyeiwu, S., & Shrestha, H. (2004). Determinants of foreign direct investment in Africa. *Journal of Developing Societies, 20*(1-2), 89-106. doi: 10.1177/0169796X04048305

Orsini, N., Bellocco, R., & Greenland, S. (2006). Generalized least squares for trend estimation of summarized dose-response data. *Stata Journal, 6*(1), 40.

Oyejide, T. (2007). *Does the ascendance of China and India boost or constrain Africa economic growth?* Paper presented at the presentation at the 8th Annual Global Development Conference of the Global Development Network on Shaping a New Global Reality: The Rise of Asia and Its Implications". Beijing, January.

Oyejide, T. A., Bankole, A. S., & Adewuyi, A. O. (2009). China-Africa Trade Relations: Insights from AERC Scoping Studies. *The European Journal of Development Research, 21*(4), 485-505. doi: 10.1057/ejdr.2009.28

Oyeranti, O. A., Babatunde, A., Ogunkola, E., & Bankole, A. (2010). China-Africa Investment Relations: A Case Study of Nigeria. *Final Report Submitted to the African Economic Research Consortium (AERC), Nairobi, Kenya*.

Palley, T. (2008). The economics of outsourcing: How should policy respond? *Review of Social Economy, 66*(3), 279-295.

Pedroni, P. (2001). Purchasing power parity tests in cointegrated panels. *Review of Economics and Statistics, 83*(4), 727-731.

Pegg, S. (2012). Social responsibility and resource extraction: Are Chinese oil companies different? *Resources Policy, 37*(2), 160-167. doi: 10.1016/j.resourpol.2011.01.002

Pesaran, M. H. (2006). Estimation and inference in large heterogeneous panels with a multifactor error structure. *Econometrica, 74*(4), 967-1012.

Pesaran, M. H. (2007). A simple panel unit root test in the presence of cross-section dependence. *Journal of Applied Econometrics, 22*(2), 265-312. doi: 10.1002/jae.951

Pesaran, M. H., Shin, Y., & Smith, R. P. (1999). Pooled mean group estimation of dynamic heterogeneous panels. *Journal of the American Statistical Association, 94*(446), 621-634.

Pesaran, M. H., & Smith, R. (1995). Estimating long-run relationships from dynamic heterogeneous panels. *Journal of Econometrics, 68*(1), 79-113.

Pöyhönen, P. (1963). A tentative model for the volume of trade between countries. *Weltwirtschaftliches Archiv*, 93-100.

Qian, X. (2012). China's Outward Direct Investment and Its Oil Quest. In Y.W. Cheung and J. de Haan, eds.,. *The Evolving Role of China in the Global Economy*(Cambridge, MA: MIT Press), 375.

Quigley, S. (2014). Chinese Oil Acquisitions in Nigeria and Angola. *Cairo: The American University in Cairo. Department of Political Science*. Retrieved from *<http://schools.aucegypt.edu/huss/pols/khamasin/Pages/article.aspx?eid=14>*.

Rasiah, R. (1995). *Foreign capital and industrialization in Malaysia*. London: Macmillan.

Rasiah, R., Cheong, L. M., Cheok, C. K., & Loayza, N. V. (2019). Introduction: ASEAN-Towards Economic Convergence. *Journal of Southeast Asian Economies, 36*(1), 3-10. doi: http://dx.doi.org/10.1355/ae36-1b

Rasiah, R., & Gachino, G. G. (2004). *Foreign firms, technological capabilities and economic performance: evidence from Africa, Asia and Latin America*: Edward Elgar Cheltenham.

Rasiah, R., Gammeltoft, P., & Jiang, Y. (2010). Home government policies for outward FDI from emerging economies: lessons from Asia. *International Journal of Emerging Markets, 5*(3/4), 333-357. doi: 10.1108/17468801011058415

Reed, W. R. (2015). On the practice of lagging variables to avoid simultaneity. *Oxford Bulletin of Economics and Statistics, 77*(6), 897-905.

Reinhart, M. C., & Rogoff, M. K. (2003). *FDI to Africa: The role of price stability and currency instability* (Vol. Paper No. 45134). Munich Personal RePEc Archive (MPRA): International Monetary Fund.

Renard, M.-F. (2011). China's Trade and FDI in Africa. *African Development Bank Group Working Paper Series, Tunis, Tunisia, 126*.

Ricardo, D. (1891). *Principles of political economy and taxation*: G. Bell.

Ricardo, D. (1955). *The Works and Correspondence of David Ricardo: Volume 10, Biographical Miscellany* Vol. 10.

Rose, A. K. (2000). One money, one market: the effect of common currencies on trade. *Economic Policy, 15*(30), 7-45.

Ross, A. G. (2015). An empirical analysis of Chinese outward foreign direct investment in Africa. *Journal of Chinese Economic and Foreign Trade Studies, 8*(1), 4-19.

Ruta, M., Dappe, M. H., Zhang, C., Churchill, E., Constantinescu, C., Lebrand, M., & Mulabdic, A. (2019). *Belt and Road Economics: Opportunities and Risks of Transport Corridors*. Washington, DC: World Bank.

Sachs, J., & Sievers, S. (1998). FDI in Africa. *Africa competitive report, Geneva: World Economic Forum*.

SAIS - China-Africa Research Initiative (CARI) (2016). *China-Africa Bilateral FDI, TNC data;* John Hopkins University, School of Advanced International Studies database.

Sanfilippo, M. (2010). Chinese FDI to Africa: What Is the Nexus with Foreign Economic Cooperation? *African Development Review-Revue Africaine De Developpement, 22*, 599-614. doi: 10.1111/j.1467-8268.2010.00261.x

Santos Silva, J., & Tenreyro, S. (2008). Trading partners and trading volumes: Implementing the Helpman-Melitz-Rubinstein model empirically. *Discussion Papers Series, Department of Economics, University of Essex*.

Schott, P. K. (2008). The relative sophistication of Chinese exports. *Economic Policy, 23*(53), 5-49. doi: 10.1111/j.1468-0327.2007.00195.x

Selaya, P., & Sunesen, E. R. (2012). Does Foreign Aid Increase Foreign Direct Investment? *World Development, 40*(11), 2155-2176. doi: http://dx.doi.org/10.1016/j.worlddev.2012.06.001

Sen, S. (2010). International Trade Theory and Policy: A Review of the Literature. Rochester: Social Science Research Network.

Sengupta, J. K., & España, J. R. (1994). Exports and economic growth in Asian NICs: an econometric analysis for Korea. *Applied Economics, 26*(1), 41-51. doi: 10.1080/00036849400000060

Shan, S., Lin, Z., Li, Y., & Zeng, Y. (2018). Attracting Chinese FDI in Africa: The role of natural resources, market size and institutional quality. *critical perspectives on international business, 14*(2/3), 139-153.

Shen, G. C., & Fan, V. Y. (2014). China's provincial diplomacy to Africa: applications to health cooperation. *Contemporary Politics, 20*(2), 182-208. doi: 10.1080/13569775.2014.907993

Shen, X. (2015). Private Chinese investment in Africa: myths and realities. *Development Policy Review, 33*(1), 83-106. doi: 10.1111/dpr.12093

Shimomura, Y., & Ohashi, H. (2013). *A Study of China's Foreign Aid: An Asian Perspective*: Springer.

Shinn, D. H. (2007). An Opportunistic Ally. *Harvard International Review, 29*(2), 52-56.

Silva, J. S., & Tenreyro, S. (2006). The log of gravity. *the Review of Economics and Statistics, 88*(4), 641-658.

Silva, J. S., & Tenreyro, S. (2010). Currency unions in prospect and retrospect. *Annu. Rev. Econ., 2*(1), 51-74.

Silva, J. S., & Tenreyro, S. (2011). Further simulation evidence on the performance of the Poisson pseudo-maximum likelihood estimator. *Economics Letters, 112*(2), 220-222.

Stojkov, A., & Warin, T. (2016). Drivers of European Transition Countries' External Current Accounts: An LSDVC Approach. *Eastern European Economics, 54*(5), 405-436. doi: 10.1080/00128775.2016.1188663

Strange, A., Park, B., Tierney, M. J., Fuchs, A., Dreher, A., & Ramachandran, V. (2013). China's development finance to Africa: A media-based approach to data collection. *Center for Global Development Working Paper*(323).

Tanzi, V., & Davoodi, H. (1998). Corruption, public investment, and growth: *The welfare state, public investment, and growth* (pp. 41-60): Springer.

Taylor, I. (2006). China's oil diplomacy in Africa. *International Affairs, 82*(5), 937-959. doi: 10.1111/j.1468-2346.2006.00579.x

Taylor, I. (2007). China's relations with Nigeria. *The Round Table, 96*(392), 631-645. doi: 10.1080/00358530701626073

Taylor, I. (2015). Chinese interest in Nigeria's oil and the American context. *Canadian Journal of African Studies / Revue Canadienne des études Africaines, 48*(3), 391-404. doi: 10.1080/00083968.2014.971833

Tenreyro, S. (2007). On the trade impact of nominal exchange rate volatility. *Journal of Development Economics, 82*(2), 485-508.

Thornton, J. (1996). Structural change in the Russian far east: The implications for trade and factor markets. *Atlantic Economic Journal, 24*(3), 208-227. doi: 10.1007/bf02298503

Thursby, J. G., & Thursby, M. C. (1987). Bilateral trade flows, the Linder hypothesis, and exchange risk. *the Review of Economics and Statistics, 69*(3), 488-495. doi: 10.2307/1925537

Tinbergen, J. (1962). Shaping the world economy; suggestions for an international economic policy. *Books (Jan Tinbergen)*.

Tobin, J. (1958). Estimation of relationships for limited dependent variables. *Econometrica: Journal of the Econometric Society*, 24-36. Todaro, M. P. (1994). Economics for a development world: New York: Longman.

Tralac - Trade Data Analysis (2018). *China-Africa trading relationship:* Retrieved from https://www.tralac.org/resources/our-resources/9174-china-africa-trading-relationship.html

Trumbull, W. N., & Wall, H. J. (1994). Estimating aid-allocation criteria with panel data. *The Economic Journal*, 876-882. doi: 10.2307/2234981

Tull, D. M. (2006). China's engagement in Africa: scope, significance and consequences. *The Journal of Modern African Studies, 44*(03), 459-479. doi: 10.1017/S0022278X06001856

Tyler, W. G. (1981). Growth and export expansion in developing countries: Some empirical evidence. *Journal of Development Economics, 9*(1), 121-130. doi: 10.1016/0304-3878(81)90007-9

Udo, E. A., & Obiora, I. K. (2006). Determinants of Foreign Direct Investment and Economic Growth in the West African Monetary Zone: A System Equations Approach. *The University of Ibadan*.

UN-Comtrade (2016). United Nations commodity trade statistics database.

UNCTAD (United Nations Conference on Trade and Development) (2014). *World Investment Report – Investing in the SDGs: An action plan*.

Van den Berg, G. J. (2001). Duration models: specification, identification and multiple durations *Handbook of Econometrics* (Vol. 5, pp. 3381-3460): Elsevier.

Vanek, J. (1968). The factor proportions theory: The n—factor case. *Kyklos, 21*(4), 749-756.

Vaschetto, S., & Yin, J. Z. (2011). China's Business Engagement in Africa. *Chinese Economy, 44*(2), 43-57. doi: 10.2753/1097-1475440203

Vernon, R. (1966). International trade and international investment in the product cycle. *Quarterly journal of economics, 80*(2), 190-207.

Vernon, R. (1992). International investment and international trade in the product cycle *International economic policies and their theoretical foundations* (pp. 415-435): Elsevier.

Vijil, M., & Wagner, L. (2012). Does aid for trade enhance export performance? Investigating the infrastructure channel. *The World Economy, 35*(7), 838-868.

Wagner, D. (2003). Aid and trade—an empirical study. *Journal of the Japanese and international economies, 17*(2), 153-173.

Wall, H. J. (1995). The allocation of official development assistance. *Journal of Policy Modeling, 17*(3), 307-314.

Wang, M. (2010). *Empirical study on African energy resources and china's outflow foreign direct investment.* Paper presented at the Allied Academies International Internet Conference.

Wang, M. J.-Y. (2007). *What Drives China's Growing Role in Africa?(EPub)*: International Monetary Fund.

Weisbrod, A., & Whalley, J. (2011). The contribution of Chinese FDI to Africa's pre-crisis growth surge: National Bureau of Economic Research.

Wenping, H. (2007). The Balancing Act of China's Africa Policy. *China Security 3*, 23 - 40. Retrieved from <file:///C:/Users/Gold%20Kafilah/Downloads/cs7_02.pdf>.

Westerlund, J., & Wilhelmsson, F. (2011). Estimating the gravity model without gravity using panel data. *Applied Economics, 43*(6), 641-649. doi: 10.1080/00036840802599784

Wooldridge, J. M. (2003). Further results on instrumental variables estimation of average treatment effects in the correlated random coefficient model. *Economics Letters, 79*(2), 185-191.

Wu, Z., & Cheng, E. (2010). Poverty Alleviation in the People's Republic of China: The Implications for Sino-African Cooperation in Poverty Reduction. *African Development Review, 22*(s1), 629-643. doi: 10.1111/j.1467-8268.2010.00263.x

Xinhua (2011). *China's Information Office of the State Council White Paper Report on Aid and Economic Cooperation. Beijing, China*.

Xinhua (2014). *China's Information Office of the State Council white paper on China's foreign aid China's Foreign Aid. Beijing, China:* Xinhua, English.news.cn.

Xu, Y.-C. (2014). Chinese State-owned Enterprises in Africa: ambassadors or freebooters? *Journal of Contemporary China, 23*(89), 822-840. doi: 10.1080/10670564.2014.882542

Yamarik, S., & Ghosh, S. (2005). A sensitivity analysis of the gravity model. *The International Trade Journal, 19*(1), 83-126.

Younas, J. (2008). Motivation for bilateral aid allocation: Altruism or trade benefits. *European Journal of political economy, 24*(3), 661-674.

Younas, J., & Bandyopadhyay, S. (2007). Do donors care about declining trade revenues from liberalization? an analysis of aid allocation. *Federal Reserve Bank of St. Louis, Working Paper 2007-028A*.

Zafar, A. (2007). The growing relationship between China and Sub-Saharan Africa: Macroeconomic, trade, investment, and aid links. *World Bank Research Observer, 22*(1), 103-130. doi: 10.1093/wbro/lkm001

Zhang, W.-B. (2008). *International trade theory: capital, knowledge, economic structure, money, and prices over time*: Springer Science & Business Media.

Zivot, E., & Andrews, D. W. K. (1992). Further Evidence on the Great Crash, the Oil-Price Shock, and the Unit-Root Hypothesis. *Journal of Business & Economic Statistics, 10*(3), 251-270. doi: 10.1080/07350015.1992.10509904