

# Understanding Sino-Zambia Trade Relations: Trends, Determinants and Policy Implications

Kanenga Haggai<sup>1,2,\*</sup>

<sup>1</sup>Department of Development Studies, University of Zambia, Lusaka, Zambia

<sup>2</sup>Department of International Economics and Trade, Southeast University, Nanjing, China

\*Corresponding author: [kanengahaggai@yahoo.com](mailto:kanengahaggai@yahoo.com)

**Abstract** In the recent past, Sub-Saharan Africa recorded impressive economic growth. Many of these countries, including Zambia, benefited from external environments, such as China's growing demand of African raw commodities coinciding with rising commodity prices. This saw unprecedented increase in both trade and investment between China and Africa. In this context, Sino-Zambia bilateral relations have deepened, especially after 2000. It is from this context of increasing Sino-Zambia/Africa trade relations and the controversy surrounding China's engagements in Africa that this paper tried to understand Sino-Zambia Trade Relations by examining the trends and determinants of Zambia's trade with China and the Policy implications thereof. To achieve this, the traditional augmented Gravity Model of International Trade and selected Trade Indicators such as Trade Intensity Index, Terms of Trade and Trade Potentials were used for the analysis covering 15 countries over a period of 15 years (2000-2014) on panel data. The results indicate that Sino-Zambia bilateral trade is significantly determined by Zambia's GDP, population and the stock of investment as well as China's GDP per capita and the stock of investment. The results also indicated that, when China is regressed together with the other partners, using the fixed effects estimation method, only partner GDP and population determine Zambia's bilateral trade. FDI stock, RTA and PTA also showed significant and positive coefficients in influencing Zambia's trade while border and language were found to have a negative influence on Zambia's trade, signifying trade barriers. Further, the analysis revealed that Sino-Zambia relations have been growing rapidly, both in scope and importance as evidenced by high Trade Intensity Index and Trade Potential; and that Sino-Zambia bilateral trade relations follow Sino-African trade relations. The paper recommends urgent investments in infrastructure development, especially transport and communications and power generation as well as the formulation of consistent and appropriate policies aimed at reducing trade barriers while promoting an export led diversification agenda. The paper further recommends further detailed studies on the economic impact of Zambia's trade with China on the Zambian Economy and on how to promote Zambia's agricultural trade with China.

**Keywords:** Sino-Zambia, China-Africa Relations, Gravity Model, International Trade

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## 1. Introduction

### 1.1. Background

According to Pigato & Tang [72], economic growth in Sub-Saharan Africa (SSA) has averaged roughly 5 percent per year over the past decade, improving living standards and bolstering human development indicators across the continent. Stronger public institutions, a supportive, private sector-focused policy environment, responsible macroeconomic management, and a sustained commitment to structural reforms have greatly expanded opportunities for countries in SSA to participate in global markets. In recent years, many countries in the region have benefited from an increasingly favorable external environment, high commodity prices, and an especially strong demand for natural resources by emerging economies, particularly China (ibid).

The past decade has seen a dramatic rise of trade between China and Africa. Overall trade with Africa rose from \$10.6 billion in 2000 to \$75.5 billion in 2008, helping to propel Africa's growth rate to 5.8 percent in 2008, and its best performance since 1974. In 2009, China promised at Forum on China-Africa Cooperation (FOCAC) to increase Africa's two-way trade to \$100 billion by 2010, to become Africa's single largest trading partner [23]. As Chileshe [23] reports, such impressive trade statistics should be to Africa's advantage. Unfortunately, like other developed countries, China is very much in the business of extraction, which leads to trade in mostly raw commodities from Africa to China and finished goods from China to Africa and is not unlike past experiences with the West.

As the volume of China-Africa trade continues to grow, According to The Information Office of the State Council of China [51], its proportion to China's and Africa's respective total foreign trade volume has also increased.

From 2000 to 2012, the proportion of China-Africa trade volume as a part of China's total foreign trade volume increased from 2.23 percent to 5.13 percent: the proportion consisting of China's imports from Africa up from 2.47 percent to 6.23 percent, and that of China's exports to Africa from 2.02 percent to 4.16 percent. From 2000 to 2012, the proportion of China-Africa trade volume as a part of Africa's total foreign trade volume increased from 3.82 percent to 16.13 percent: the proportion contributed by Africa's exports to China increased up from 3.76 percent to 18.07 percent, and that by Africa's imports from China from 3.88 percent to 14.11 percent.

As Romei [66] noted, China is Africa's main export market and also its largest source of imports. After 15 years of closer trade ties, China accounts for about 20 percent of imports in Sub-Saharan Africa and about 15 percent of its exports. But in the past year, the share of exports to China has started to decline while the growth of Chinese imports has been increasing.

Zambia's bilateral relation with China dates back to the pre-independence period when present-day Zambia was a protectorate of Great Britain. However, economic relations between the two nations were limited until more recently. In the past four decades-and especially in the past two-China's growing economy has caused it to take a greater interest in Zambia's economy. Zambia was first to establish diplomatic relations with China in Southern Africa just after independence [64] with the establishment of the Zambia-China Economic and Trade Cooperation Zone (ZCCZ) in 2007, the first overseas Economic and Trade Cooperation Zone established by the Chinese Government in Africa-it is also the first Multifacility Economic Zone of Zambia.

Reports show that, for example Chileshe [23], since 2005, China has applied zero-tariff treatment for trade with African countries, and, as at the end of June 2009, about \$890 million African products enjoyed preferential treatment. A key platform of the FOCAC IV ministerial meeting in 2009 was to encourage imports of finished African goods into the Chinese market. The total annual growth of Sino-Africa trade has averaged more than 40 percent, and stood at \$106.8 billion in 2008 versus \$30 billion just four years earlier in 2004. By 2006, the number of zero-tariff Zambian exports into China had grown, from 192 in 2005, to over 452. This is occurring in the context of a decline in demand for Africa's basic exports to the West. For instance, Africa's share in the EU foreign trade has fallen 3.2 percent to about 1.3 percent between 1989 and 2009.

Zambia's trade balance with China has also been increasing in the recent past. The 2008 Sino-Zambia trade accounted for 19.7percent of Zambia's total foreign trade (exports to China-13.8 percent, imports 6.9 percent), making China become the second largest trade partner of Zambia. Sino-Zambia bilateral trade balance reached US \$1.3 billion in 2013, of which, Zambia's imports from China accounted for US \$956, 655 thousand while Zambian exports to China taking the other balance with US \$2.3 billion. This was particularly impressive for the rich copper Zambia, having been recording some imbalances in trade with China. Zambia's trade balance with China grew only by 0.6 percent from 2012, standing at US \$927, 683 thousand to a value of US \$933, 551

thousand in 2014. Of this, Zambia's export value in 2012 stood at US \$1, 799, 145 billion and dropping to US \$1,790, 964 billion in 2014 from a US \$2.3 billion record in 2013 (ITC<sup>1</sup>, UN COMTRADE, 2016<sup>2</sup>).

However, with the decline in the performance of China's GDP amid sluggish global growth, further reducing global demand for raw commodities, of which Zambia heavily relies on for her exports, the performance of Zambia's exports to China remains uncertain. It is also important to note that the current Sino-Zambia trade relation has perpetuated Zambia's dependence on natural resources. According to Romei [75], the reduced external demand and lower commodity prices caused a 13 percent contraction in Chinese imports in the 12 months to October 2015 over the same period a year earlier. By comparison, the Report (ibid) revealed that the value of imports from Africa over the period fell 32 percent. This contraction is steeper for Angola, South Africa, Republic of Congo, Equatorial Guinea and Zambia. Simply, despite the sluggish African exports to China, Chinese exports to Africa Continue to rise.

With this background, it becomes imperative to understand these trade trends and what really determines them. This is so important for the Sino-Zambia Trade Relation. What is the force behind these trends? What policy implications do these imply? How does this Sino-Zambia bilateral trade relation fit within the context of Sino-Africa relation amidst growing concerns over China's engagement with Africa? Does Zambia have any potential for further trade with China? People have sought to understand the pattern and trends of trade between China and Africa and narrowly between Zambia and China; however, one key issue which has been neglected is the determinants of these bilateral trade trends. To our knowledge, this is the first comprehensive empirical study to investigate the Sino-Zambia trade relations, trends, and their determinants, especially within the context of Sino-Africa engagements. In light of growing discussions about China and its impact in Africa, as well as the growing trade and investments, it is very important to understand the dynamics of individual heterogeneous African countries. Many have been taken away by the "Africa Trap<sup>3</sup>" such that most researches focus on macro Sino-African relation issues. It is this very motivation of this paper to seek to understand Sino-Zambia Trade Relations, trends and determinants and the implications these have on policy.

## 1.2. Significance/Rationale

This study will especially be useful to policy makers in understanding Sino-Zambia trade relations, trends and their determinants and the policy implications therein. Based on the Trade Intensity Index, a measure of trade proximity, the high levels of trade proximity between Zambia and China denotes a *de facto* participation in the same free trade agreement or the absence of strong legal barriers to trade [67]. This is most clearly evident when considering that, thus far, bilateral Sino-African trade has involved significant preferential measures such as zero

<sup>1</sup> [http://www.trademap.org/Bilateral\\_TS.aspx](http://www.trademap.org/Bilateral_TS.aspx)

<sup>2</sup> <http://unctadstat.unctad.org/wds/TableViewer/tableView.aspx>

<sup>3</sup> A term coined in this paper to mean the "tendency by many to view Africa as one country, when actually, not".

tariffs for an expanded range of African products (up to 97 percent of African exports to China are to be duty free by 2015) (ibid). With this high trade dependence on China, it becomes imperative to identify and understand the determinants of these trends. Understanding what determines the trends in Sino-Zambia trade could facilitate the redesigning of trade, investment and other policies that seemingly constrain trade to ensure that the trade potential is efficiently and effectively utilized for the mutual benefit of the two countries. The study further strives to contribute knowledge to this field as empirical Sino-Zambia trade literature is limited and mostly at the regional level. This study is first to specifically examine the trends and determinants of trade between China and Zambia empirically. Importantly, this paper served as a partial requirement for the award of the Master Degree in International Trade, Southeast University, China.

### 1.3. Aims/Objectives

Given the bilateral trade relations Zambia has had with China, the current Sino-African relations under the Forum on China Africa Cooperation and new developments which are likely to influence trade flows between the two countries, such as Chinese One Belt One Road Initiative (OBOR), this paper aimed to achieve the following:

1. To examine Sino-Zambia bilateral trade trends
2. To examine the determinants of Zambia's trade with China
3. To assess the policy implications and recommendations for the Zambian government

### 1.4. Methodology

#### 1.4.1. Part A: Trends Analysis

The first part, Trend Analysis used Trade indicators based on comprehensive data as an analytical tool.

#### 1.4.2. Part B: Empirical Analysis

##### 1.4.2.1. Model Specification

The gravity model of international trade was first developed independently by Tinbergen [84] and Pöyhönen (1963). In its basic form, the gravity equation predicts that the amount of trade between two countries is proportional to their economic mass, measured by GDP and population, and inversely proportional to the distance between them. Later works, such as Linnemann [65,66] included population as an additional measure of country size, employing the now commonly referred to as the augmented gravity model. Since then, the model has been widely used in international trade and now including migration, and foreign policy.

The basic gravity model of trade is represented as:

$$X_{ij} = KY^{\alpha} Y_j^{\beta} / D^{\theta} \quad (1)$$

From equation (1) above,  $X$  denotes the value of exports between countries  $i$  and  $j$ ,  $Y$  is the value of nominal GDP,  $ij D$  is the physical distance between the economic centers of countries  $i$  and  $j$ ,  $K$  is the gravitational constant, while  $\alpha$ ,  $\beta$  and  $\theta$  are parameters, and *a priori* signs of  $\alpha$  and  $\beta$  are positive while  $\theta$  is negative.

Equation (1) can be converted into log-linear form as:

$$\ln X_{ij} = K + \alpha \ln Y_i + \beta \ln Y_j - \theta D_{ij} + \delta Z + u_{ij} \quad (2)$$

From equation (2),  $\delta Z$  denotes other factors that may positively or negatively affect export flows, while  $u_{ij}$  is the stochastic term. Equation (2) can be interpreted such that exports are positively affected by the economic mass (measured in GDP and population) of the trading partners and inversely related to the distance between them. As Karamuriro and Karukuza ([60], page 48) indicated, citing [25], more variables, such as population, indicators of cultural affinity, and sharing of borders are usually added to empirical gravity models to elaborate on the economic mass and distance variables.

We can therefore derive the augmented gravity equation from equation (2). It can be expressed as given below:

$$X_{ij} = \beta_0 Y_i^{\beta_1} Y_j^{\beta_2} N_i^{\beta_3} N_j^{\beta_4} D_{ij}^{\beta_5} A_{ij}^{\beta_6} e^{ym} \varepsilon^{u_{ij}} \quad (3)$$

From the equation above (3),  $X_{ij}$  is the value of exports between pairs of countries;  $Y_i$  ( $Y_j$ ) represents the value of nominal GDP of the exporter (importer),  $N_i$  ( $N_j$ ) is the population of the exporter (importer),  $D_{ij}$  is the physical distance between the economic centers of the two countries,  $A_{ij}$  represents other factors that could aid or impede exports between countries,  $e^{ym}$  is a vector of dummy variables that test for specific effects, and  $\varepsilon^{u_{ij}}$  is the error term [60].

For the purposes of understanding the determinants of Zambia's trade with China, this paper adopted the augmented and linearized basic model of Jan Tinbergen [84] and also used by Karamuriro and Karukuza [60] which they derived from the basic gravity equation in international trade. Karamuriro and Karukuza [60] used the following formulation:

$$X_{ijt} = \beta_0 Y_{it}^{\beta_1} Y_{jt}^{\beta_2} GDPPC_{it}^{\beta_3} GDPPC_{jt}^{\beta_4} GDPPCDIF_{ijt}^{\beta_5} REAL_{ijt}^{\beta_6} D_{ij}^{\beta_7} \beta_8 Language_{ij} \beta_9 Border_{ij} \beta_{10} COMESA \beta_{11} EAC \varepsilon^{u_{ijt}} \quad (4)$$

The above can be rewritten in its natural logarithm as below:

$$\begin{aligned} \ln X_{ijt} = & \ln \beta_0 + \beta_1 \ln Y_{it} + \beta_2 \ln Y_{jt} + \beta_3 \ln GDPPC_{it} \\ & + \beta_4 \ln GDPPC_{jt} + \beta_5 \ln GDPPCDIF_{ijt} + \beta_6 \ln REAL_{ijt} \\ & + \beta_7 \ln D_{ij} + \beta_8 \ln Language_{ij} + \beta_9 \ln Border_{ij} \\ & + \beta_{10} \ln COMESA + \beta_{11} \ln EAC + U_{ijt} \end{aligned} \quad (5)$$

We therefore, adopted and extended the linearized equation for this present paper as given below so as to include other variables of interest such as FDI and some dummy variables.

$$\begin{aligned} \ln X_{ijt} = & \ln \beta_0 + \beta_1 \ln Y_{it} + \beta_2 \ln Y_{jt} + \beta_3 \ln GDPPC_{it} \\ & + \beta_4 \ln GDPPC_{jt} + \beta_5 \ln POP_{it} + \beta_6 \ln POP_{jt} + \beta_7 \ln FDI_{it} \\ & + \beta_8 \ln FDI_{jt} + \beta_9 \ln D_{ij} + \beta_{10} \ln Language_{ij} + \beta_{11} \ln Border_{ij} \\ & + \beta_{12} \ln Colony_{ij} + \beta_{13} \ln RTA_{ij} + \beta_{14} \ln FTA_{ij} + U_{ijt} \end{aligned} \quad (6)$$

From equation (6) above,

$X_{ijt}$  is the total exports from country  $i$  (Zambia) to country  $j$  (China or other partners) at time  $t$ ;  $Y_{it}$  is the nominal GDP for country  $i$  (Zambia) at time  $t$ ;  $Y_{jt}$  is the

GDP for country  $j$  (China or other partners) at time  $t$ ;  $GDPPC_{it}$  is the GDP per capita of country  $i$  at time  $t$ ;  $GDPPC_{jt}$  is the GDP per capita of country  $j$  at time  $t$ ;  $POP_{it}$  is the total population of country  $i$  at time  $t$ ;  $POP_{jt}$  is the total population of country  $j$  at time  $t$ ;  $FDI_{it}$  is the stock of FDI in country  $i$  at time  $t$ ;  $FDI_{jt}$  is the stock of FDI in country  $j$  at time  $t$ ;  $D_{ij}$  is the geographical distance between the countries  $i$  and  $j$ ;  $Language_{ij}$  is a proxy of cultural distance to capture whether countries  $i$  and  $j$  use the same official language, as a dummy variable, it takes on the value of 1 if yes and zero otherwise;  $Border_{ij}$  refers to whether countries  $i$  and  $j$  share the same border, as a dummy variable, it takes on the value of 1 if yes and zero otherwise;  $Colony_{ij}$  refers to whether countries  $i$  and  $j$  share some historical background such as one being a colony of the other or if they were colonized by the same country, as a dummy variable, it takes on the value of 1 if yes and zero otherwise;  $RTA_{ij}$  refers to whether countries  $i$  and  $j$  belong to the same regional trade agreement, as a dummy variable, it takes on the value of 1 if yes and zero otherwise and  $FTA_{ij}$  refers to whether countries  $i$  and  $j$  have a preferential trade arrangement between them, as a dummy variable, it takes on the value of 1 if yes and zero otherwise.

#### 1.4.2.2. Variable Definition

The dependent variable used in the analysis was exports in USA dollars from Zambia to China and other trading partners. The other variables all used, such as GDP, GDP per capita, Population, and FDI for both exporter and importer, as well as distance, common official language, Regional Trade Agreement and Preferential Trade arrangement are all independent variables.

GDP captures the level of economic development and the market size of an economy. It is believed that the larger the size as measured in GDP, the more a country trades with others. It also captures the productive capacity of the exporting country and the purchasing power of the importing country. A higher GDP signifies greater potential supply from the exporting country and increased demand in the importing country [60]. Therefore, the coefficients of the GDP variables are expected to be positive.

It is thought that the GDP per capita income of a country may affect trade in two different ways. On one hand, a large GDP per capita income may signify a large domestic market, high level of self-sufficiency and less need for trade. While on the other hand, a large GDP per capita income may promote economies of scale in production hence promoting the desire to trade in a greater variety of goods. The estimated coefficient for the GDP per capita income is therefore, ambiguous [60].

Holding other factors constant, a larger population is associated with lower levels of bilateral trade. The relatively smaller population therefore, tends to increase bilateral trade. As such, the expected coefficient for this variable is ambiguous [26].

Common official language as a proxy of trade costs emanating from cultural distance between the peoples of the two countries is thought to enhance bilateral trade flows between countries. People who use the same official language find it easier to do business with each and easily develop trust, a key element in trade negotiations and sustained and effective partnerships. As Linnemann [65,66]

stresses, linguistic links and other historical and cultural links are particularly important at reducing the cost of unfamiliarity in international trade. Huntington [65,66] advanced that trade patterns will be decisively influenced by the patterns of culture. As such, culture plays a significant role in international trade. The estimated coefficients for language and colony variables are expected to have a positive sign.

Contiguous (border) is expected to promote bilateral trade as sharing a boarder with another country immensely reduces transportation costs thereby promoting trade. Countries with a shared border have higher chances of stronger bilateral trade relations. This variable is expected to have a positive influence on trade. This is similar to distance, which is though expected to have a negative influence on trade because the farther countries are from each other, the lesser they trade, at least in theory. This is one short-coming of the gravity model as it does not distinguish those countries with easy access to marine transportation and landlocked ones.

RTA and PTA are other dummy variables which have been used to see the impact of Regional Trade Agreement and Preferential Trade Agreement/arrangement on the trade of member countries. Since the purpose of a Trade Agreement/Preferential Trade Arrangement is promoting trade, therefore, RTA and PTA are expected to have positive signs.

#### 1.4.2.3. Sampling and Data

We used annual panel data on Zambia and her top 14 trading partners, including China, whose bilateral relation with Zambia is the main focus of this study. The selection of these countries was purposive; in 2014, they accounted for an aggregate share of about 87 percent of the total Zambian merchandise trade, with China accounting for 29 percent of that share in the same year. The data is for the period 2000 to 2014. We decided to use panel data because it helps to capture the relevant relationships among variables over time, reduces the collinearity among the explanatory variables, improves efficiency of econometric estimates, and controls for unobservable individual heterogeneity and dynamics [13].

The principal data source for exports values is *COMTRADE*<sup>4</sup> which provides detailed raw trade data by partner and product. The source figures were adjusted and/or complemented by data from the International Trade Center<sup>5</sup>, when considered necessary. The export data presents merchandise trade by trading partner and product based on three digit levels SITC Revision 3 commodity classification, expressed in thousands of dollars. In addition, data are also summarized by geographical region, economic and trade grouping, for both reporting country and its trading partners, and by product grouping.

Data on nominal GDP; based on GDP in national currency and exchange rate projections-expressed in billions US Dollars, distance-measured in square kilometers, colonial link, common language, and contiguous/boarder were obtained from the CEPII<sup>6</sup> Databank. The CEPII provides comprehensive data

<sup>4</sup>[http://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx?IF\\_ActivePath=P,15912&sCS\\_ChosenLang=en](http://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx?IF_ActivePath=P,15912&sCS_ChosenLang=en)

<sup>5</sup>[http://www.trademap.org/Bilateral\\_TS.aspx](http://www.trademap.org/Bilateral_TS.aspx)

<sup>6</sup>[http://www.cepii.fr/CEPII/en/bdd\\_modele/presentation.asp?id=8](http://www.cepii.fr/CEPII/en/bdd_modele/presentation.asp?id=8)

specially developed and designed for the gravity model, covering the basic variables required to run the gravity equation. Data on GDP per capita were obtained from the World Bank's World Development Indicators<sup>7</sup>. We obtained data on total national population from the International Futures website<sup>8</sup>. Data on FDI was obtained from the Global Economy<sup>9</sup>.

### 1.5. Thesis Outline

The outline of the rest of this paper is as follows: Following the background to the study, theoretical and empirical studies are reviewed under chapter two which follows. Here, the ground for this study is established. We proceed to chapter three which investigates the genesis, evolution and current Sino-Zambia/Africa relations; then, trend and empirical results are adequately discussed in chapter four. Lastly, chapter five presents the conclusion and recommendations.

### 1.6. Summary

This chapter laid a ground for this study. In trying to understand Sino-Zambia trade relations, the paper examined trends and the determinants of Sino-Zambia bilateral trade by using the traditional Augmented Gravity Model of International Trade and selected Trade Indicators based on comprehensive data as an analytical tool. The next chapter reviews relevant literature used in this study.

## 2. Literature Review

This chapter presents the relevant literature used for this study. Literature review plays a critical role in empirical studies and in understanding the trend in that particular field thereby contributing to the development of theoretical and empirical ideas. Literature is here assessed and validated for the credibility of this present study. The literature is logically presented to maintain a coherent and sound flow of ideas and developments.

### 2.1. China-Africa Relations: New Neo-colonization?

In the recent past, with the eminence of China in the global stage, especially its increased engagements with Africa, there has been a myriad of research activities, especially qualitative ones. There have been growing concerns from different schools of thought regarding China's relations with Africa. This sub-section presents some of the empirical studies on China-Africa relations.

In an interesting study of colonial patterns in the growing African and China interaction, Maswana [67] used trade indicators such as the Composition and Relative Trade Intensity Indices. Using this trade-dependency perspective, given the high level of trade intensity with China, he disputed claims of Chinese imperialism in Africa. However, as he fears, his findings

of trade intensity, implying a high degree of dependency on China, could be interpreted to justify the allegations proponents of the Chinese "New Neocolonialism" lay over China's activities in Africa. He however concluded that such high trade intensity indicators could be understood that; Angola, the Sudan, the D.R Congo, the Republic of the Congo, Gabon, Chad, Zambia and Mauritania, having the highest trade index with China, as being "Chinese Zones of Influence" [67].

Maswana [67]'s conclusion was based on the comparisons of Europe's motives for colonial expansion into Africa as the pursuit of mineral wealth and territorial conquest and China's thirst for African minerals and the concomitant infrastructure development, exacerbated by the heavy and growing reliance of Africa on China for financing of its projects. He quickly asserts that "China's alleged neocolonialism in Africa within the economic and trade structures does not stem from a territorial settlement or state-centric view" ([67], page 96).

Maswana [67]'s argument arose from Sanusi [78]'s, who pointed to China's practice of importing raw products from Africa. This view is held by many, at least based on trade and investment trends. The West's fears have been the growing Chinese influence in Africa and China's involvement with the so called "undemocratic" African Countries.

Chen, Dollar and Tang [21], in an article they wrote on China's direct investments in Africa, disputed claims of Chinese colonialism in Africa. In another study they conducted [22], using both panel and sectoral data on Chinese investment in Africa, they found out that "...all things equal, resource rich countries receive more FDI...The standard deviation across African Countries of the resource rents variable is 17.6, so that the coefficient indicate that one standard deviation richer resource wealth attracts 49% more FDI." They argued that such claims are a myth not backed up by data. Their report indicated that there are about 2000 Chinese firms operating in Africa; and that, during the 2013-2014 period, Chinese Investment to Africa accounted for 4.4 percent of the total stock of investment on the continent. They however, having found out that Chinese investments tend to be higher in resource-rich African countries, that could not mean China is colonizing Africa because western countries are the leading investors in Africa.

Junbo and Frasherri [58] investigated the claim of Chinese colonialism in Africa. They pointed out salient arguments in understanding China's economic engagements in Africa. They stressed on the need to understand the characteristics of a colonial system and being able to differentiate between a colonial system and colonial behavior. From their perspective, there is need to understand the structure of Africa's trade with China, The structure of China's investment to Africa and, the macro-influence of China's engagement on Africa's economic growth, governance and social transformation. They argued that China's behavior in Africa resembles that of Africa's former colonizers but that, in nature and reality, China isn't, rather contributes to Africa's development and the de-colonization efforts. They further argued that China's behavior in Africa looks like a colonial state in Africa because its activities have features of neo-colonialism. This is so because the major reason China engages with Africa is to pursue resources and materials.

<sup>7</sup> [http://databank.worldbank.org/data/reports.aspx?Code=NY.GDP.PCAP.CD&id=af3ce82b&report\\_name=Popular\\_indicators&popularitytype=series&ispopular=y](http://databank.worldbank.org/data/reports.aspx?Code=NY.GDP.PCAP.CD&id=af3ce82b&report_name=Popular_indicators&popularitytype=series&ispopular=y)

<sup>8</sup> [http://www.ifs.du.edu/ifs/frm\\_CountryProfile.aspx?Country=ZM](http://www.ifs.du.edu/ifs/frm_CountryProfile.aspx?Country=ZM)

<sup>9</sup> [http://www.theglobaleconomy.com/rankings/fdi\\_dollars/](http://www.theglobaleconomy.com/rankings/fdi_dollars/)

While it exports manufactured goods to the continent. They cited FDI flows which tend to flow towards those resource-rich countries.

Junbo and Frasherri [58] further cited the influence of large Chinese-State owned corporations in African countries' industries, whose development, is to some extent relied on China's investment and trade. The paper also cited negative social and political impacts of China's involvement on the continent such as environmental deterioration, abuse of human rights, non-respect for local culture, corruption and self-enclosure in African countries. Recognizing such Chinese activities and involvement, they however refute the claims of Chinese neocolonialism arguing that China does not exploit Africa because the prices are not dictated by China, rather, agreed upon. They also cited the increasing volume and diversification of African exports to China, stressing that even though China seeks resources in Africa; its activities are no different from other countries.

Taylor [81] argued that China's engagements with Africa are resource-based. He argued that this is entirely driven by China's quest for oil resources. He however, notes that oil is not the only resource China was interested in. however, as he pointed, a look at the top 10 trading partners in Africa reveals that with the exception of South Africa, China's main trade connections in Africa are with oil-producing states. This then validates the argument that China's engagement with Africa is resource driven. This then brings China's neocolonial discourse to fore. Taylor (ibid), in the same paper, summarized China's engagement with Africa to be two-fold (a) in the short-term, to secure oil-supplies to help feed the demand in China, and (b) in the longer-term position China as a global player in the international oil market. Taylor [81] further advanced that China's renewed engagement with Africa followed the Tiananmen Square in June 1989 when China was heavily criticized by the West and African countries supported China. This then supports the idea that China is seeking for allies in its global power repositioning to counter-react the West. He concluded that Chinese foreign policy in Africa and elsewhere is, like all other countries' foreign policies, self-serving and based on economic and strategic considerations.

After a thorough review of Sino-Africa engagements, in view of China's colonial activities in Africa discourse, we therefore conclude that China is not colonizing African countries in any way. We however quickly point out that it is true, though, that China, in some circumstances, exhibits colonial tendencies exhibited by Africa's former colonialists; resource-seeking and portrays self-interests motives. This however cannot be substantiated given massive developments China has contributed to Africa in the form of trade, investments, aid, and other contributions. We argue that African countries should be proactive and take a full responsibility of their own developments by ensuring that increased engagements with China should be a strategic opportunity to enhance trade and investment while industrializing.

## 2.2. The Gravity Model: Theoretical Foundation

The gravity model has been widely used to estimate bilateral trade flows in international trade. Trade flows

from country  $i$  to country  $j$  are modelled as a function of the supply of the exporter country, the demand of the importer country and trade barriers. This simply means that national incomes of two countries, transport costs (transaction costs) and regional agreements are assumed to be the main determinants of trade [27]. As an applied concept motivated by Newton's gravity law, gravity models have become widely used and important analytical tools in international trade. However, despite the gravity model's considerable empirical success; its high explanatory power, it has been criticized for lacking strong theoretical foundations. More recently, different theories have been developed to establish rigorous theoretical underpinnings of the gravity model. Tinbergen [84] and Pöyhönen (1963) are credited to have been the first to use the gravity model. However, the theoretical foundation has been derived from the new international trade theory based on increasing returns of scale, imperfect competition and geography [8,46].

Linnemann [69,70] proposed a gravity model based on a partial equilibrium model of trade, adding a variable to reflect the trade flow constitution. He explained exports of country  $i$  to country  $j$  in terms of the interaction of three factors: potential supply of exports of country  $i$ , potential demand of imports from country  $j$ , and trade barriers [27]. These contributions were followed by more formal attempts to derive the gravity equation from models that assumed product differentiation. Assuming Cobb-Douglas preferences and constant-elasticity of substitution preferences, Anderson [7] was the first to derive that. This is what today is called the Armington assumption that products are differentiated by country of origin.

Bergstrand [15,16] investigated the theoretical determination of trade by employing constant elasticity of substitution and monopolistic competition model. He also included per capita income, which is an indicator of demand sophistication and incorporated factor endowment variables (Heckscher-Ohlin) and taste variables (Linder). Helpman and Krugman (1985) used a model of trade in differentiated products to estimate the share of intra-industry trade. Here, the gravity model was derived under the assumption of increasing returns to scale in production.

The gravity model has also been widely used in the applied literature to evaluate the impact of regional agreements and the border effect on trade flows [9], Dearnorff [28] proved that the gravity model is consistent with Heckscher-Ohlin Trade Theory. Anderson and Van Wincoop [9] proved that relative trade costs are very important if the gravity model is to be well specified. These models assume perfect competition.

As stated earlier, the gravity model has undergone several structural transformations. Previously, it faced intense criticism regarding its theoretical foundation. Thus far, it has proved to be a consistent tool for analyzing bilateral trade flows. The contestation about the gravity model lacking a theoretical basis is now justified. The theoretical basis for the gravity model can be explained within the frameworks of the classical trade theories such as the Ricardian model-which basically advances comparative advantage and the differences in production technologies; the Heckscher-Ohlin model-which looks at the relative endowments and the Helpman and Krugman model.

As Kareem [61] elaborated, the Ricardian and the Heckscher-Ohlin models do not pay attention to “increasing returns to scale, imperfect competition and transport costs”. Helpman and Krugman [45], however further derived the equation under imperfect competition markets and increasing returns to scale. Van Wincoop [8,10] and Helpman, Metlitz and Rubeinstein [47] have done substantial work in ensuring that, empirically, the output of the gravity equation is well defined on theoretical grounds. Kareem [61] argued that the most important thing has to do with the structural form of the gravity equation and the implication of misspecification or omitted variable bias. This has to do with the way trade costs and firm heterogeneous behavior is incorporated into the gravity equation.

### 2.3. Gravity Model Application: Empirical Review

We investigated some of the studies which did apply the gravity model in understanding the determinants of bilateral trade between and among groups of countries. The gravity model of bilateral trade hypothesizes that exports between two countries are proportional to their economic mass (measured by GDP and population size) and inversely proportional to the distance between them. Empirical works [36] have extensively applied the gravity model with different specifications. For this present study, we tried to use as much relevant literature as possible to validate whether there would be consistency with our findings. The following are the empirical studies investigated;

In a study of Portuguese Trade and European Union with the Gravity Model of international trade, Leitao and Tripathi [63] examined the determinants of bilateral trade between Portugal and the European Union countries (EU-27) for the period 2000-2010, using a panel data. In their study they revisited the recent contributions of Charoensukmongkol and Sexton [20], Samy and Dehejia [78], Serrano and Pinilla [80], and Faustino and Proença [37]. The findings showed that Portuguese trade flows are consistent with the Linder hypothesis. As the gravity model postulates, the empirical results of this study demonstrated that geographical distance has a negative and significant effect on bilateral trade-this is to mean that the closeness of trade partners influence bilateral trade between them such that if the partners are close, bilateral trade between them increases. The economic dimension and common border are positively correlated with bilateral trade. They found their results supporting the hypothesis that physical capital endowment has a positive effect on bilateral trade.

But in a study of product-quality view of the Linder-Hypothesis (a proposition that countries with a similar demand pattern trade more. In other words, countries of similar income per capita should trade more intensely with one another), Hallak [42] built a theoretical framework in which, as in Linder’s theory, product theory played a central role. His results deviated from the Linder Hypothesis, arguing that empirical evidence has failed to provide consistent support for it. Hallak [42] demonstrated the reason for the failure pointing to the use of an inappropriate empirical benchmark. Using the gravity equation he obtained an estimation using trade data

aggregated across sectors. The hypothesis is shown to hold only if it is formulated as a sector level prediction.

In his study of Intra-Regional Trade flows, using Uganda and her East African Community State Partners, namely: Burundi, Kenya, Rwanda and Tanzania, Mukiibi [69] found out that the GDP per capita, and the population for Uganda, absolute difference between Uganda’s GDP per capita and partners and circle distance were positively related to Uganda’s bilateral trade flows. He found these variables to be statistically significant.

The study (ibid) was made possible by the use of the gravity model of international trade. Using a log-linearized augmented model, the model was estimated on the basis of single country variables. This was done to test and compare relative importance of the study variables in the country of origin and destination countries.

Mukiibi’ study [69], however contradicts other studies indicating that the GDP for bilateral trading partners is statistically significant in determining the flow of trade. In his study, he found out that the GDP for partners was insignificant and that the relationship between Uganda’s partners’ GDP per capita with Uganda’s bilateral trade flows was negative. He however did not provide any explanation for his results.

In a paper, Adekunle and Wanjiru [3] studied the trade flow between China and Sub-Saharan Africa in the quest to understand the realities surrounding the trade relations between China and Sub-Saharan Africa. Their paper examined the impact of variables such as GDP, distance, FDI, inflation, exchange rate and GDP per capita have on trade flow between China and Sub-Saharan Africa and vice versa.

In using the gravity model, they also examined how the trade flow of oil rich countries is affected by trading with China while considering the interactions with other macroeconomic variables. Their results from a fixed effects regression model showed that the GDP and exchange rate for Sub-Saharan African countries were significantly positive. The implication of this meant that if the GDP of SSA Countries increased by a unit, the volume of exports to China would increase by 1.62 units. For exchange rate, they found out that if the local currency unit per \$ US goes up by 1 unit, trade in terms of exports to China would improve by 0.29. From this, we can infer that improved economic activity in Sub-Saharan African Countries would improve their exports to China, thereby improving welfare from the gains of trade and helping with their balance of payments deficits.

Within this study, the five oil producing countries were regressed separately to examine the determinants of their exports. They found out that the GDP of China, GDP/Capita of China and the exchange were significant. The GDP/Capita for China and the exchange rate had a negative impact on the export of the oil producing countries to China. However, GDP of SSA countries, GDP/capita of SSA countries, FDI and the exchange rates were the significant variables that determine Chinese exports to SSA countries with a negative impact on imports from China. This can be explained by an increase in the middle class, because as their incomes increase, might prefer better high quality products to Chinese sub-standard imports.

Mohmand, Salman, Mughal, Imran and Makarevich [68] investigated the export potential of Pakistan using the

gravity model of trade. They wanted to highlight the main influencing factors affecting the export environment of Pakistan. The results indicated that Pakistan has a lot of export potential with most of its partners. The study also found out that all the variables passed their respective signs apart from the border variable. The results also show that, numerically, for a 1 percent increase in the GDP of the importing country, will result in a 2.44 percent [exp (0.89)] and 3.21 percent [exp (1.17)] in exports of Pakistan, respectively. For distance, it was found out that for a 1 percent increase in distance, would result in a 0.31 percent decrease in Pakistan's exports.

Alleyne and Lorde [6] examined the trade flows in commodities for CARICOM countries through the use of the traditional gravity model of international trade. Their study found out that per capita GDP differential, trade to GDP and language all impacted trade positively. They further found out that, as the model predicts, geographical distance along with exchange rates and historical trade relations had negative effects on trade.

In a similar study, Foad [38] analyzed the determinants of Chinese trade with 65 countries in Africa and the Middle East over a period of 1985-2008. The study found out that Chinese trade is influenced by three main factors, namely; access to markets, securing natural resources and foreign policy as proxied by a country's diplomatic relations with Taiwan. The paper further advances that the presence of Export Processing Zones and Chinese FDI act as a gateway for imports of differentiated products from China. He found out that China appears to be using trade as a political tool-as it was observed that those countries which gave allegiance to Taiwan as opposed to Mainland China have less trade with Mainland China. It was however observed that exports of homogenous goods to China appear to be unaffected by the Taiwan issue. This, as was advanced by Foad [38] suggested that China's need for natural resources is supreme. It was also found out that a 1 percent increase in a country's GNI is predicted to increase trade flows by 2.2 percent, being consistent across both exports and imports.

A related study by Drummond and Liu [31] found out that trading with China has allowed African countries to diversify their exports away from their traditional partners. However, they have also led to Sub-Saharan African (SSA) countries to become more susceptible to spillovers from China. Based on their panel data analysis, Drummond and Liu [31] found out that a 1 percentage point increase (decline) in China's domestic investment growth is associated with an average 0.6 percentage point increase (decline) in SSA countries' export growth and that this impact is larger for resource-rich countries. This implies that China's economic growth has an indirect impact on SSA's trade through price effects. As they explained (ibid), as net exporters of commodities, some SSA countries are affected by fluctuations in economic activity through its effects on world commodity prices, because China is a dominant importer of various commodities. This means that China's domestic investment growth has a positive and significant impact on SSA countries' exports.

Didier and Hoarau [30] found out that BRICs (Brazil, Russia, India and China); except for Russia had important trade engagements with Sub-Saharan Africa (SSA). They estimated gravity models of bilateral exports and imports of 47 African Countries relative to BRICs, considered as a

group and individually, on the period 2000-2010. The results confirmed the negative impact of distance geographical remoteness together with the positive effects of SSA and the BRICs GDPs. Further, their investigation also highlighted obviously specific role China plays compared to the other BRICs members based on the terms of trade, natural resources and democracy variables.

Using the augmented variables, Didier and Hoarau [30] also found out that being richly endowed in natural resources has a positive effect on African trade with BRICs, but that the coefficient is not significant. When estimated individually, the GDP of African exporters were significantly positive. However, concerning the GDPs of importing countries, only the GDPs of Brazil and India conformed to the theory. The coefficients from the GDP *per capita* differential were all non-significant for Brazil, Russia, India and China. They gave two reasons for this observation (i) "the fact that trade is relatively diversified with Russia and India; (ii) the strong difference in terms of development levels allowing the coexistence between intra and inter-trade links in the case of the trade with Brazil and China" ([30]: page 12).

In desiring to assess COMESA regional integration efforts and to identify the most effective and important variables that determine trade intensity of Egypt with COMESA countries, Elmorsy [34] used the gravity model to estimate the variables. Using panel data for COMESA countries, the paper found out that there a lot of opportunities to increase Egypt's trade with COMESA. GDP and existence of sharing border are the most effective variables that determine Egypt's trade with COMESA. This meant that Libya and Sudan are the most important export markets for Egypt because they share a border with it, although Libya is more important than Sudan because it's GDP and GDP per capita are larger than it (Libya). Additionally, more dummy variables were added to a proxy of the cost of trade between Egypt and COMESA countries, of which, Egypt is a member of COMESA as well. These variables included, among other common ones, "infrastructure" and "Policy (tax on international trade)".

Coe and Hoffmaister [26] estimated a gravity model to investigate the variation in bilateral trade between southern developing countries and northern industrial countries, in an effort to address the question of whether Africa's bilateral trade with industrial countries is comparable to trade with other developing country regions. The estimates were based on a very large sample consisting of 48, 048 observations on bilateral trade between 84 developing countries and 22 industrial countries from 1970 to 1995. Results showed significant evidence supporting the view that restrictive trade policies have contributed to low levels of bilateral trade between African and industrial countries. The main findings of the study are that Africa's trade is in fact unusual, but is explained by economic size, geographic distance, and population. However, after controlling for these various factors of bilateral trade, results suggest that Africa's trade is not at all different.

In another study, Subramanian and Tamirisa [81] explored Africa's trade with other African countries as well with other developed and developing countries. They found out that Africa, specifically Francophone Africa, was under-exploiting the trading opportunities available

and has witnessed disintegration over time. They further found out that Anglophone Africa had failed to keep pace with global integration; however, they concluded that when Africa's trade performance is measured relative to that of other developing countries, the disparity in performance is striking, because developing countries as a whole seem to have strengthened their links with the global economy over time.

An interesting study done by Brulhart, Dihel and Kukenova [9] analyzed Zambian export patterns using a new transaction-level trade data set for the period 1999-2011. Their econometric analysis was complemented by a qualitative study of the Zambian export sector. Like other studies, they too found out that Zambian exports are highly concentrated, at least in international comparison terms. They found out that multivariate models of survival probabilities suggest that exchange rate volatility, and difficulty access to imported inputs significantly inhibits diversified and stable exports.

A key departure from our current study is that they focused on the key determinants of Zambian export volatility while we focus on the determinants of Zambian exports in general and to China specifically. As Zambia scales up efforts to diversify the exports away from the traditional mineral (copper) dominated ones, it is important to understand the determinants of trade flows and export volatility. As such, Brulhart, Dihel and Kukenova [18]' study complements our current study.

### 3.4. Summary

This chapter looked at several studies conducted around the issues of Sino-Zambia/Africa relations and the application of the gravity model in understanding the determinants of bilateral trade between and among groups of countries.

The first part of the chapter looked at Sino-Zambia/Africa relations and the increased Chinese engagements with Africa; of cardinal was the notion that China is practicing neocolonialism in Africa, given the unmatched influence Beijing exerts on the African countries. Having reviewed the different perspectives on this subject, the section concludes that such claims of Chinese colonialism are merely an academic rhetoric. It is true; however that China exerts some degree of influence on the African economies, but that should not be equated to colonialism or its new forms. The section recommends that African countries take a full responsibility for their own local grown and driven development, taking advantage of Chinese investment in creating employment, and transferring appropriate technology. Trade should be promoted between Zambia and China, by lowering the barriers and promoting efficiency and competitiveness to fully benefit from the gains from trade.

The second part investigated empirical studies that applied the gravity model of international trade. The investigation of literature concludes that the gravity model is a robust and valid tool in understanding the determinants of bilateral trade. Just as the model predicts, several variables used by these studies [3,6,30,31,34,42,68] were consistent with the model. Further, Mukiibi (2006) found out that partner GDP and GDP per capita were negatively related to Uganda's bilateral trade with partners. Foad [38] added new variables such as access to markets,

securing natural resources and foreign policy as well as the presence of export processing zones, Chinese FDI and GNI to the model which he found to be positive and statistically significant in determining China's bilateral trade with 65 African and Middle East countries. One observation from some studies such as Didier and Hoarau [30], and Adekunle and Wanjiru, [3] is that China's GDP does not appear to influence African exports, rather, growth in both Chinese investments abroad and home.

This present paper intended to understand Sino-Zambia bilateral trade by investigating the trends and the determinants. We used the gravity model to see whether there is consistency with the results with regards to Sino African trade patterns and determinants. The results are then compared to these studies. The following chapter presents Sino-Zambia/Africa relations.

## 3. Sino-Zambia/Africa Relations

### 3.1. Profiling Zambia

The Republic of Zambia is a resource-rich country with massive mineral endowments (especially copper) and agricultural potential. It is geographically large but relatively sparsely populated with about 15.52 million people [53]. Zambia has capitalized on these factors. It is now a lower middle-income country that experienced robust growth in the past decade and was among the 10 fastest growing economies of Sub-Saharan Africa in 2012. Much of this economic growth was observed during the implementation of the Fifth National Development Plan (FNDP) from 2006 to 2010. Yet, during that period, growth did not translate into commensurate improvement in living standards, especially in rural areas. The 2010 national poverty incidence of 60 percent was not much different from the 62.8 percent of 2006. With the vast majority of the population dependent on subsistence agriculture, Zambia's rural poverty was as high as 78 percent in 2010, not much different from 80 percent in 2006 [39].

Zambia has had a long period of political stability, with a Polity Index of 16.91, out of 20 score and a Freedom Indicator of 9.314 out of 14 as ranked by the International Futures [53]. With strong growth in the last decade the country has reached lower middle income status. Investor confidence has been high as evidenced in the successful issue of two Euro bonds. Independent since 1964, Zambia has experienced five successful multiparty elections since the return to multiparty politics in 1991 [86]. The latest elections in January 2015 (bi-election after the death of the then incumbent), were peaceful, and further strengthened Zambia's democratic credentials.

The past decade has seen Zambia achieve robust economic growth, with gross domestic product (GDP) growing at and above 7 per cent annually between 2005 and 2014 [64]. These very high growth rates are attributable largely to the rise in global commodity prices and the ensuing inflow of foreign direct investment (FDI) in copper extraction. However, this economic growth has bypassed the vast majority of the population. The swing of global economic slowdown has not spared this resource rich country, seeing the price of copper, whose export is the main stay of the Zambian economy. Growth in

demand for the metal has slowed as China looks to reposition its economy towards consumer-led growth and away from exports and investment. These trends have impacted negatively the Zambian economy. As such, it is timely to understand these trends and the determinants of Zambia's bilateral trade with her partners, especially

China, given the later's prominence in the global trading system. Equipped with such an understanding, Zambia can adequately device strategies to woo investments in such key areas as agriculture, infrastructure development, tourism and manufacturing as it forges ahead with the diversification agenda.

Table 3.1. Zambia's Economic Profile

Development Indicators of Zambia				
Social Indicators	Zambia		Africa	Developing countries
	1990	2014	1990	2014
Area ('000 Km <sup>2</sup> )	752.6		30,046.40	80,976.00
Total Population (millions)	7.9	15	1,136.50	5,628.50
Population growth (annual percent)	3	3.3	2.5	1.4
Life expectancy at birth, total (years)	51.1	59	59.6	65.7
Economy				
	Zambia			
	2000	2013	2014	
GNI per capita, Atlas method (current US\$)	310			
GDP (current Million US\$)	3,253.60	26,820.90	30,512.10	30,512.10
GDP growth (annual percent)	3.6	6.7	5.7	5.7
Per capita GDP growth (annual percent)	1	3.4	2.4	2.4
Gross Domestic Investment (percent of GDP)	17.4	38.6	40.4	40.4
Inflation (annual percent)	26.1	7.1	6.8	6.8
Budget surplus/deficit (percent of GDP)	-0.5	-7.3	-6.6	-6.6
Trade, External Debt & Financial Flows				
	Zambia			
	2000	2013	2014	2010
Export Growth, volume (percent)	-6.2	21.9	8.5	8.5
Import Growth, volume (percent)	2.5	16.2	-1.5	-1.5
Terms of Trade (percent change from previous year)	-4.6	-6.5	-3.9	-3.9
Trade Balance (mn US\$)	-221.0	1,450.70	2,039.90	2,039.90
Trade balance (percent of GDP)	-6.8	5.4	6.7	6.7
Current Account (mn US\$)	-596.8	197.6	0.1	0.1
Current Account (percent of GDP)	-18.4	0.7	0	0
Debt Service (percent of Exports)	15.7	3.7	3.7	3.7
External Debt (percent of GDP)	224.8	34.4	34.7	34.7
Net Total Inflows (mn US\$)	700.9	0	0	0
Net Total Official Development Assistance (mn US\$)	794.7	1,142.40	0	0
Foreign Direct Investment Inflows (mn US\$)	121.7	1,810.90	0	2,846.50
External reserves (in month of imports)	2.2	3	3.5	3.5

Source: ADB Statistics Department (<http://zambia.opendataforafrica.org/>), based on various national and international sources (2016)

Regardless though, Zambia presents huge investment opportunities of which China can consider. The Zambia Development Agency<sup>10</sup>, through the government of the Republic of Zambia provides incentives for investors who seek to invest in key priority areas such as the agricultural, tourism, energy, infrastructure, manufacturing and mining sectors. Further, Zambia provides investment guarantees, market access and has a stable governance system which is investor friendly.

### 3.2. Profiling China-A Snapshot

As Pigato reports [72], growth of China's annual gross domestic product (GDP) had slowed to 7.5 percent in 2013/2014, further slowing to 6.9 in September of 2015. The doubling of Chinese capital stock between 2005 and 2011 has resulted in excess production capacity and the rate of return on capital is declining. Meanwhile, average household consumption remains low by international standards. The Government of China has responded by

initiating a gradual process of economic rebalancing designed to shift the economy toward a more sustainable model, one in which growth will be driven less by investment and exports and more by domestic consumption [72]. This is a normal process large economies go through as they transcend to a more sustainable level of development, "New Normal" as is called. These policies have been complemented and sustained by the continued implementation of deep structural reforms to promote a more open and competitive private sector. These rebalancing mechanisms are poised to affect China's trade with Africa immensely.

However, these changes present challenges and opportunities for African countries as they look to the east as a new viable model of development based on non-interference. China, now, looks appealing to many African Countries as China, politically speaking, attaches no conditions in its dealings with Africa. China's lower growth rate and changing demand composition are already affecting commodity prices, with particularly strong impacts on global mineral markets. At the same time, the

<sup>10</sup> <http://www.zda.org.zm/?q=content/investment-opportunities>

tripling of Chinese labor costs over the past decade has enabled countries with large labor forces and low wage rates to compete with Chinese producers and even attract investment from Chinese firms [72].

### 3.3. Evolvement of Sino-Zambia/African Relations

Sino-Zambia relations have evolved over time dating back to pre-independence era when China provided active support to the Zambian government in its efforts to consolidate political independence and struggle against western colonialist control. The diplomatic relation was however officially established on October 29, 1964 (Mwanawina 2008). Bilateral relations between the two countries have gradually evolved to modern times covering a wide spectrum of issues such as political, trade relations and economic and technical cooperation, as well as exchanges in the fields of culture, education and health<sup>11</sup>. Cementing this relation has been the monumental construction of the Tanzania-Zambia Railway (TAZARA) with Chinese assistance, which has become a cornerstone of Sino-African Relations. In the past four decades-and especially in the past two-China's growing economy has caused it to take a greater interest in Zambia's economy. Zambia was first to establish diplomatic relations with China in Southern Africa just after independence.

Historically, as Mwanawina (2008) reports, modern Sino-Zambia relations start from the Bandung Summit of 1955 and CCP policy guided by Mao's theory of the 'Third World'. The main focus as at that time was largely political; based on political alliances against colonialism. "This guideline was the foundation of China's foreign policy towards African countries and, later on, the discourse of Sino-African brotherhood and friendship based on shared colonial history against the West was repeatedly invoked in mutual diplomatic activities" ([88], quoting [6]: page 11). It is argued that this relation in some way was reciprocal; China assisting African countries with liberation and independent political movements while African countries were supporting the newly founded People's Republic of China with its diplomatic endeavors. For example, when China assisted Zambia with a loan to construct the monumental railway line, Zambia supported China in the UN Security Council accession bid.

Over the years, this focus on political alliance began shifting toward economic cooperation based on "mutual economic benefits and common development" after the 1980s and 90s. This relation is often portrayed to be based on "reliable friendship, non-interference and sovereign equality"<sup>12</sup> (Elden, 2005, page 147). However, this relation is often conditioned to the "One China Policy".

In the recent past, current Sino-African Relations have been manifested in the Forum on China-Africa Cooperation (FOCAC) with the recent one held in South Africa, December of 2015. This represents the new positioning of China-Africa relations, with parties agreeing to upgrade from a new strategic partnership to a comprehensive strategic partnership<sup>13</sup>. Over the years, massive developments in the area of cooperation, trade, cultural and educational exchanges have been achieved.

Under this forum, Chia has given African countries special trading arrangements in the quest to promote African exports to China. China has also provided favorable loans and investments without conditions, a major departure from the conventional western aid, loans and investments.

In his recent article, Ambassador Tian XueJian [83] reports this "...China exempted the tariff on 97 percent of the commodities exported to China from the 31 least developed African countries. Chinese enterprises were encouraged and supported to construct more than 20 economic and trade cooperation zones in Africa....Driven by the measures of FOCAC, China-Africa economic and trade cooperation witnessed rapid growth. In 2014, China-Africa trade volume reached US\$ 222 billion, 21 times of that in 2000. China's stock investment in Africa was over US\$ 30 billion, more than 60 times of that in 2000. At the same time, the field of cooperation was expanded, and the structure was optimized. The manufacturing industry, finance, tourism, telecommunication, aviation, broadcasting and TV have become new highlights of economic and trade cooperation. Working together, China and Africa have achieved win-win development." This is how far Sino-African relations have evolved.

The Sino-Zambia relations are consistent with Sino-African relations. Nevertheless, as Wu ([88]; page 12) reports, "Zambia enjoys a unique position as the show-piece of the success of Sino-African relations as well as the 'experimental region' of new Chinese diplomatic policies in Africa. First of all, Zambia is one of the African countries which have the longest-standing diplomatic relations with the People's Republic of China." Wu [88] further reports that the Tanzania-Zambia railway construction in the 1960s and 70s has been the most significant Chinese project in Africa taking more than ten years from planning to completion and involved around 12,000 workers in total. As Wu argues, we conjecture that this symbol makes Zambia a well-known and popular African country at the grassroots level in China and attracts more migrants in because of the image of Zambia, promoted by Chinese government, as a 'safe, politically stable and friendly' country. Because of this historically close relation between the two countries Zambia has the most dependent relation with China. It has also always been chosen as the experimental region to trial new Chinese-African policy.

Chinese firms have invested heavily in mining and other sectors in Zambia over the last 10 years with investment exceeding \$3 billion in 2014, according to latest Chinese embassy estimates<sup>14</sup>. This was revealed by the then Chinese Ambassador to Zambia Mr. Yang Youming during the commemoration of the 65<sup>th</sup> anniversary of the People's Republic of China. Further, he stated that there were over 550 Chinese businesses operating in Zambia by October 2014<sup>15</sup>.

Recently, a group of 30 Chinese companies is set to invest a colossal sum of US\$1 billion in a manufacturing hub to be called 'One Belt and One Road Industrial Park'. This was revealed last November (2015) when twenty executives representing the companies from China visited

<sup>11</sup> [http://www.chinadaily.com.cn/china/2007-01/26/content\\_793504.htm](http://www.chinadaily.com.cn/china/2007-01/26/content_793504.htm)

<sup>12</sup> <http://www.china.org.cn/english/features/China-Africa/82055.htm>

<sup>13</sup> <http://www.focac.org/eng/zxxx/t1353788.htm>

<sup>14</sup> <http://www.ghanaweb.com/GhanaHomePage/world/Zambia-expects-1-bn-in-Chinese-investments-397625>

<sup>15</sup> [http://www.chinadaily.com.cn/world/XiattendsParisclimateconference/2015-12/04/content\\_22632611.htm](http://www.chinadaily.com.cn/world/XiattendsParisclimateconference/2015-12/04/content_22632611.htm)

Zambia to look at the sectors of the Zambian economy in which to invest in. The industrial park, spearheaded by International Physical Distribution Group and the Zhongrum Investment Development Group Corporation Limited (Zambia), is envisaged to stand on a sprawling 700 hectares of land. It will host over 20 high-tech firms engaged in bicycle and water pump assembling, environmental refuse disposal management, construction, concrete processing, municipal engineering, and petrochemical manufacturing and packaging. The companies will also be involved in advanced medical materials, illumination, plastic material, physical distribution management, packaging, agriculture and tourism<sup>16</sup> Zambia Overseas Chinese Association chairman Zhang Jian said the first phase of the US\$1 billion investment would gobble US\$300 million while the remainder will be invested in the later phases. This huge investment reflects the confidence private Chinese businesses have in Zambia's economy, cementing the bilateral relations between the two countries. Such investments will help actualize the much touted Africa-China co-operation at national level where its impact should be felt.

However, just like the overall Sino-Africa relations, Sino-Zambia relations have faced challenges from criticism. The often cited issue from critiques concerns the alleged ill-treatment of Zambian workers by Chinese managers and the disregard for local labor and safety issues. This followed the release of a report by the Human Rights Watch in 2011 titled "You'll be Fired if You Refuse: Labor Abuses in Zambia's Chinese State-Owned Copper Mines." Others have likened the Chinese engagements in Africa to earlier colonial tendencies of the west. Wu (2014), reports that this historical image of a 'healthy Sino-Zambian brotherhood' and Zambia's position in China's African policy has been seriously challenged by the anti-Chinese political campaign that has surfaced since 2006. This sentiment has grown due to everyday accusations of low wages and ignorance of safety procedures among the Chinese businesses in Zambia, and was accelerated by several shooting accidents during protests [44].

### 3.4. Key Drivers of China's Engagement with Africa

"FOCAC was formally established at the 2000 Ministerial Conference of the Forum on China-Africa Cooperation in Beijing in October 2000 under the joint initiative of China and Africa with the purposes of further strengthening friendly cooperation between China and African states under the new circumstances, jointly meeting the challenges of economic globalization and seeking common development"<sup>17</sup>. The principles of FOCAC reflect the underlying China Africa Policy and China's engagements in Africa.

The historical experiences the two parties share cannot be disputed. Over the years, bilateral trade and economic cooperation have grown rapidly. This relation has been guided by the principles of "sincerity, equality and mutual benefit and solidarity and common development."<sup>18</sup> From

the Chinese perspective, its engagement with Africa is driven by the need to enhance solidarity and cooperation with the African Countries. Beijing has always insisted on "mutual benefit, reciprocity and common prosperity." Based on this, given China's stance on non-interference approach to foreign affairs, the One-China Principle as a basis for engagement is often questioned [17,38].

From the economic point of view, the fact that China, in its China Africa Policy, encourages and pledges support to Chinese enterprises willing to invest in Africa and the explicit willingness to negotiate Free Trade Agreements with African Countries makes us to infer that China is seeking access to African markets. Further, the underlying intuition under the "resource cooperation" is access to the abundant natural resources Africa is endowed with. We stress that the terms of trade for the African raw commodities often turn against her as they (terms of trade) are volatile. In this regard, we see the maintenance of the status quo; Africa riddled with the "natural resource curse" as this relation perpetuates the old phenomenon which relegated Africa into underdevelopment. However, we stress this point with caution, for indeed, in many ways China has proved to be different from the old colonialists. Arguably, China has lived its principles of non-interference, sovereign equality and mutual benefit. Africa has hugely benefited from Chinese investments in various sectors, providing employments to thousands and promoting development on the African Continent.

Based on Brautigam [17]'s findings on the strategic challenges China faces with its engagement with African countries, we deduce three key drivers of China's engagement with Africa. These are as follows:

- i. The need to find new export markets to fuel further expansion of domestic production, and now, with the rising labor costs in China, there is need to secure opportunities for Chinese enterprises under the going global strategy as the Chinese economy transitions into the "new normal" phase of development.
- ii. The need to find more resources abroad to keep pace with the resource demand from rapid economic growth. However, this view is contestable as the Chinese economy slows down; there has been a reduction in the demand for raw materials from Africa, affecting the African development prospects [75].
- iii. The need for allies among developing countries to counter-balance the predominance of the developed countries in international organizations like the UN and IMF.

The above were also echoed by Foad [38] in his study of "China's Trade with Africa and the middle East." His study however looked only at trade relations, is consistent with the predominant Sino-Africa engagements. His empirical study found out that Chinese trade with Africa is determined by 'access to local markets, securing natural resources, and foreign policy as proxied with a country's diplomatic relations with Taiwan.

As Elden (2005) posits, the impetus for Africa's embrace of China has not been adequately examined. We hold the same view with him, further advancing that empirical studies need to be conducted from the African perspective why Africa engages with China. However, the point that China seeks resources from the African

<sup>16</sup> <https://www.daily-mail.co.zm/?p=50051>

<sup>17</sup> <http://www.focac.org/eng/ltida/ttj/t933522.htm>

<sup>18</sup> [http://en.people.cn/200601/12/eng20060112\\_234894.html](http://en.people.cn/200601/12/eng20060112_234894.html) accessed on 08/04/2016 at 02:19 a.m

countries is valid to a certain extent and that Africa finds engaging with China favorable due to China's non-interference and equal sovereignty policy. One core point many Sino-African commentators forget is that China has always had engagements with Africa even before the current renewed engagement.

As the Chinese economy dynamically develops, there has been a surge in the demand for energy resources to maintain the level of economic growth. This has seen an increased engagement with African countries especially those endowed with energy resources such as Sudan, Congo DR, Nigeria, Angola, Gabon and others including mineral resource rich countries such as Zambia (Elden, 2005).

Slightly deviating from the natural resource drive is the need to preserve the national food security. Alden [4] argued that food is a growing concern. With a projected increase in population following the relation of the "One Child Policy" Alden ([4], page 149), further reports that, due to the growing food security concern, China's Ministry of Foreign Trade and Economic Cooperation (MOFTEC) has sought to encourage Chinese investment in Africa, stating that "Chinese invested companies engaged in the production of farm machinery, agricultural processing and small production trading targeted for the world market will find immense business potential" (in Africa).

As of the first quarter of 2016, in a recent interview (<http://www.focac.org/eng/jlydh/sjzs/t1351357.htm> access on 15/04/2016: 3:58pm), it was noted from the Chinese ambassador to Zambia that Xi Jinping's proposal of "Ten Cooperation Plans" and the consequent establishment of a cross-department called "China Cooperation Council" had already submitted a plan for China-Zambia Priority Cooperation Areas, expressing the hope to develop cooperation with China in the fields of infrastructure construction, agriculture, energy, tourism and training of human resources. He also said that China-Zambia trade has been growing rapidly since the beginning of the new century, with their trade jumping from US\$100 million in 2000 to US\$3.8 billion in 2014.

### 3.5. Summary

The section laid a foundation for the study, tracing the evolution of the current Sino-Zambia/African Relations. The section concludes that the bilateral relation between China and Africa (and between China and Zambia) has been growing rapidly both in scope and eminence often seen in the increased trade (both in volume and value), investment and cooperation between them. It is argued that, even though the Sino-African relation is based on "win-win cooperation", the current pattern favors China more and that China's impetus in engaging with Africa is driven by the need to access markets and raw materials as well as on diplomatic basis, at least from the widely held view in Sino-Africa relation literature. On the one side, from the Chinese perspective, the engagements are based on the need for "South-South" cooperation and friendly engagements on a "win-win" platform. While on the other side, from the African perspective, engagement with China gives them access to, contrary to conventional Western style, unconditional aid, FDI and development in form of infrastructure and others. Sino-Zambia/Africa relation is dynamic.

The next chapter presents results on the trends and determinants of Sino-Zambia bilateral trade as well as determinants of Zambia's foreign trade with the top 14 partners.

## 4. Results/Discussion

### 4.1. Part A: Trend Analysis

#### 4.1.1. Zambia's Trade Structure by Selected Major Trade Partners

From the top 20 major trading partners of Zambia, we sampled 14. Of these, includes the leading top 2 countries; and these are China and Switzerland. In aggregate terms, the selected partners accounted for about 87 percent of the total merchandize trade in value terms. The export data calculations used presents merchandise trade by trading partner and product based on three digit level SITC Revision 3 commodity classification, expressed in thousands of dollars.

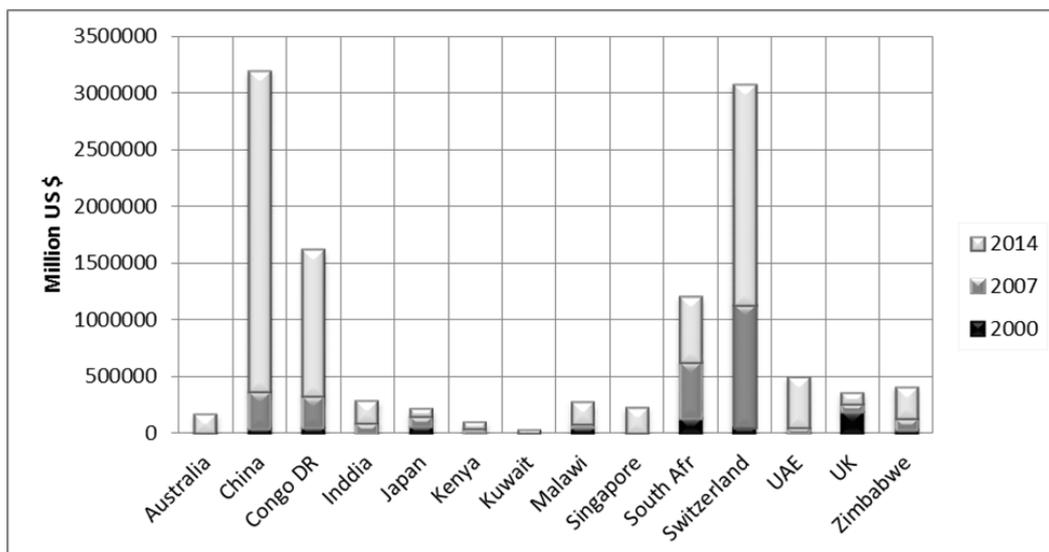


Figure 4.1. Zambia's exports to the selected trade partners in Merchandize trade value-Millions US\$ (2000, 2007 & 2014)

Figure 4.1 above shows the major destinations of Zambia's exports at three intervals within the same period under investigation. One striking observation is how the exports to China grew relative to Zambia's traditional partners like the United Kingdom and South Africa. We

can observe that China, Switzerland, Congo DR, and South Africa had the largest shares to Zambia's total merchandize trade from the three selected intervals during the period of investigation (2000, 2007 and 2014).

**Table 4.1. Partners' share [individual and aggregate (& growth)] in Zambia's total merchandize exports (percent): 2000-2014**

Partners' share in Zambia's exports (percent)				Partners' aggregate share			
Country	2000	2007	2014	Year	Share (percent of total)	Change in percent	Aggregate growth
				2000	66		
China	4.5	7	29	2001	66	0	10
Switzerland	5.7	23.4	20.1	2002	63	-3	7.7
Congo DR	5	6.1	13.3	2003	55	-8	9.7
South Africa	14.4	10.7	6	2004	57	2	64.6
UAE	0.02	0.9	4.6	2005	69	12	39.5
Zimbabwe	2.6	2.2	2.9	2006	64	-5	93
Singapore	0.2	0.07	2.3	2007	57	-7	9.6
India	1.6	1.5	2.1	2008	63	6	21.1
Malawi	4.7	0.7	2	2009	74	11	0.4
Australia	0.2	0.02	1.7	2010	84	10	88
UK	20.6	1.6	1	2011	81	-3	21.3
Japan	6.1	1.9	0.7	2012	83	2	6.6
Kenya	0.5	0.7	0.6	2013	86	3	16.5
Kuwait	0.3	0.2	0.04	2014	87	1	-7.7

Source: Author's own calculations based on UNCTAD Trade Statistics, 2016

Table 4.1 above presents interesting trends in Zambian merchandize trade, especially to the sampled countries. From left side of the table, it was observed that, during the period under investigation, South Africa consistently retained position number two or three in terms of percentage contributions to Zambia's total merchandize trade. Another interesting observation is on the trade diversion from Zambia's traditional trade partners like the United Kingdom to relatively new trade partners. One outstanding country as a destination for Zambia's exports is China, having only contributed about 4.5 percent of the total merchandize trade in 2000 at position number 7 after the United Kingdom, South Africa, Japan, Switzerland, Congo DRC and Malawi, taking up the first spot respectively in that order. By 2014, China's share in Zambia's Merchandize trade as an exports destination massively rose to 29 percent, becoming Zambia's number one exports partner.

Factors which can be attributed to this trade creation on the part of China include but may not be limited to the following; one major factor attributed to this trend is the creation of the Forum on China-Africa Cooperation in the early 2000s, which, in a way served as a preferential trade arrangement. China, in showing commitment, provided for a reduction on tariffs in a range of African commodities. Reports show that, since 2005, China has applied zero-tariff treatment for trade with African countries, and, as at the end of June 2009, about \$890 million African products enjoyed preferential treatment. A key platform of the FOCAC IV ministerial meeting in 2009 was to encourage imports of finished African goods into the Chinese market. By 2006, the number of zero-tariff Zambian exports into China had grown, from 192 in 2005, to over 452 [23]. This is in a situation where Zambia's trade with traditional partners has been

declining. Take for example, the United Kingdom. Exports to the UK have reduced drastically over the years. Striking, in 2000, the UK took the largest share at 20.6 percent and only to reduce to a meager 1 percent by 2014.

Other factor which could offer an explanation to this phenomenon is the establishment of the Zambia-China Economic and Trade Cooperation Zone (ZCCZ) in 2007 (Leslie, 2014). Two Special economic zones have since been established in Zambia through the support of the Chinese government to facilitate Chinese investments and exports. Additionally, increased Chinese investments due to enhanced bilateral relations between the countries could also have resulted in increased bilateral trade as shown by the figures. Trade reforms in both countries could also be a reason for the increased trade between them.

Another major reason for this could be the increased Chinese demand for minerals resulting from the robust economic growth China enjoyed in the past few years coupled with rising metal prices almost at the same time. Furthermore, in the recent past, this can also be seen with China's lower growth rate and changing demand composition already affecting commodity prices, with particularly strong impacts on global mineral markets. According to the Financial Times Report [75], the reduced external demand and lower commodity prices caused a 13percent contraction in Chinese imports in the 12 months to October 2015 over the same period a year earlier. By comparison, the Report (ibid) revealed that the value of imports from Africa over the period plummeted 32percent. Looking at the trade statistics from UNCTAD database, even when China as a destination country for Zambian exports, in terms of shares, increased to becoming the largest, in value terms growth in merchandize trade reduced by 12.3 percent.

The left side of Table 4.1 above shows the aggregate share of sampled trade partners for the entire period under review. On average these 14 countries accounted for 70 percent of Zambia's total merchandise trade with an average growth rate of 27 percent. In 2014, on aggregate, these countries accounted for 87 percent in terms of trade share as export markets for Zambian products. However, even when their share had increased relative to the total merchandise trade, in absolute value, export growth reduced by 7.7 percent. This could be explained by the reduction in the global demand for copper and other metals, especially in China, Zambia's top export product category destination. The copper prices have also been declining in the recent past coupled with the blurred global growth.

From the results in table 4.1 above, we observe a pattern contrary to the Linder Hypothesis, an assumption that; countries with similar income levels trade more with one another. Hallack [42] disputed this hypothesis on the account of inappropriate empirical benchmark and lacking support for it thereof. From our results, in terms of Zambia's trade with countries of similar income levels, we doubt the practicality of the Linder Hypothesis. First, developing countries have similar products; take for example, from our sample; Zambia does not trade much with Malawi, Zimbabwe, Congo DR and Kenya even when these countries share two regional agreements among themselves (COMESA and SADC). Zambia shares borders with Congo DR, Malawi and Zimbabwe. Yet, as the figures show, Kenya only accounted for 0.6 percent of Zambia's total merchandise exports in 2014. While Malawi accounted for 2.0 percent, Zimbabwe 2.9 percent, and the Congo DR, with a relatively higher share, only accounted for 13.3 percent of the total merchandise trade in the same year. This is in a sharp contrast with China, South Africa and Switzerland, taking the largest shares.

A similar pattern was echoed by the World Trade Organization in the 2013 World Trade Report. The report

found out that; on trade within and between developed and developing economies, the share of North-North trade has dropped steadily from 56 percent in 1990 to 36 percent in 2011. This decline coincided with the rising South-South trade, which increased from 8 percent to 24 percent over the same period. But the share of North-South trade remained remarkably steady since 2000 at around 37 percent. This trend has been facilitated by the emergence of Countries like China. However, for small developing countries with similar commodities such as mineral resources, practically, the hypothesis does not hold here.

#### 4.1.2. Zambia's Trade by Sector and Product Category

Table 4.2 below shows the main sectors and product category of Zambia's exports as classified under the HS6 system. As observed below, basic manufactures, or commonly referred to as the mining sector in Zambia, accounted for 75.8 percent on average between 2010 and 2014. Of these, Copper cathodes and sections of cathodes unwrought accounted for 90.2 percent and 93.9 percent for 2010 and 2014, respectively. There is a high marked difference between the first sector and product category and the second one with 70.5 percentage average difference. This shows how the Zambian exports are concentrated in the mineral extraction industry and the importance this category plays in the total output. However, this concentration raises concerns over risks associated with the raw commodities, especially copper in this regard. This sector often suffers losses from external economic shocks due to its high level of concentration, spilling the effects to the entire Zambian economy. This therefore calls for diligent efforts from the government in its industrialization and diversification efforts, more importantly, manufactured value-added commodities. The table only included those sectors and product category with an average share of 3 percent and above between 2010 and 2014.

**Table 4.2. Sectoral diversification in products for Zambia's exports**

Sector	Average share of sector in country's exports 2010-2014	Share of top 3 detailed products (HS6) in sector's exports		Sector's leading exported product HS6
		2010	2014	
Basic manufactures	75.8	90.2	93.9	740311 Copper cathodes and sections of cathodes unwrought
Fresh food	5.3	69.4	51.2	240110 Tobacco, unmanufactured, not stemmed or stripped
Processed food	4.6	72.1	51.3	170111 Raw sugar, cane
Minerals	4.5	74.8	66.8	710399 Precious/semi-precious stones nes further worked than sawn/rough shaped
Chemicals	3.6	41.3	75.2	280700 Sulphuric acid; oleum
<b>Item</b>	<b>2000</b>	<b>2007</b>	<b>2014</b>	
<b>Number of products</b>	119	172	199	
<b>Concentration Index</b>	0.443662	0.641014	0.611794	
<b>Diversification Index</b>	0.842981	0.81898	0.838514	

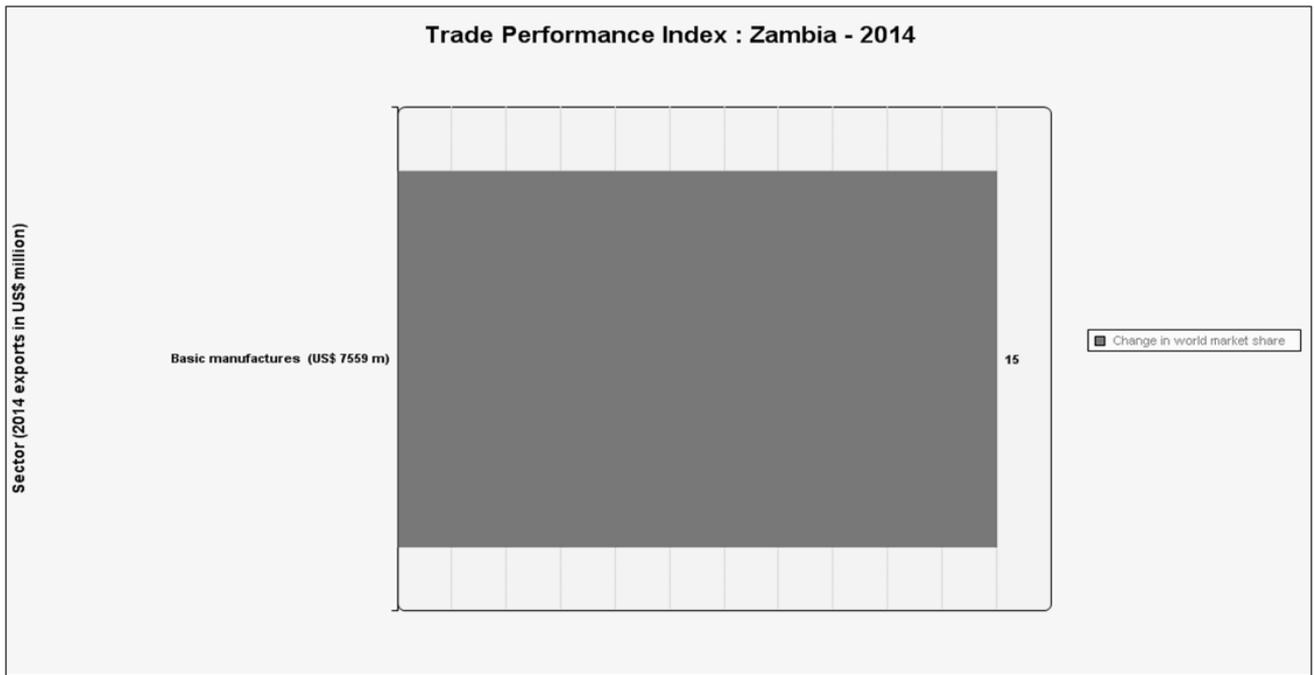
Source: ITC Trade Competitiveness Map.

Note: HS codes refer to the revision 2007.

Nes in product labels means not elsewhere specified.

Also, from the lower section of table 4.2 above, we can observe the performance of the Zambian exports, having improved from 119 products in 2000 to 199 exports products by 2014. To the contrary, the concentration index has been worsening despite an increased number of export products during the same period. It rose from 0.443662 in

2000 to 0.611794 in 2014, though having shown a small improvement from 2013's 0.641014. Intuitively, we can say that, in terms of volume, Zambia's exports portfolio has been growing, but in terms of value, they are still concentrated in a few mineral products.



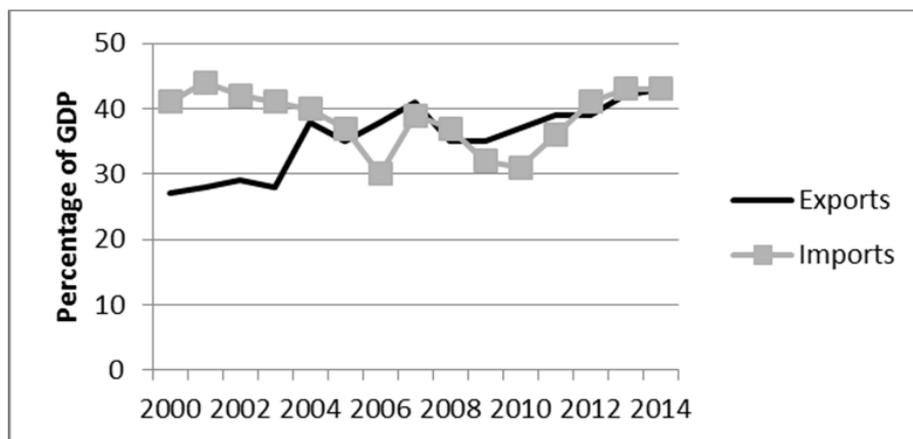
**Figure 4.2.** Ranking of international competitiveness in terms of static indicators (Current index)\* Position 1 in the ranking refers to the best performance out of 189 countries

Source: International Trade Center, Trade Competitive Map, 2016.

As can be seen from the trade performance index above (figure 4.2), Zambia has relatively been losing competitiveness in the basic manufactures sector (mineral products), ranking number 15 out of 189 countries captured in 2014 despite having scored the number 3 slot in 2013. This signifies how important the sector is to the Zambian economy that Zambia has relied on it for decades despite challenges associated with terms of trade problems with raw commodities. On average, this sector has contributed about 75 percent to the total national exports. In relative terms, the basic manufacture trade sector has been doing well in Zambia. On the trade performance box above, the outer layer depicts the most competitive country under that category of products in terms of trade. The shaded box inside signifies the place that individual country occupies. The larger the box, such that it gets closer to the outer layer, the more competitive a country's

sector becomes in international trade. As seen in the box, Zambia held the number 15 slot, very close to the outer layer.

From Figure 4.3 below, the share of total imports, for both merchandise goods and services was declining from about 2001, taking about 43percent as a share of GDP to 31percent in 2010 before beginning to rise in 2011 to 43percent in 2014. On average, during the period under review, imports of goods and services accounted for about 38.4percent as a share of GDP. For exports, the percentage was steadily growing, beginning with 27percent in 2000 to 2007 with 41percent as a share of GDP before plummeting the following two years. The share of exports of goods and services as a percentage of GDP averaged 36percent during the period under review, slightly lower than the average share of imports during the period, before converging in 2014.



**Figure 4.3.** Zambia's Exports and Imports of Goods and Services (percent of GDP)

Source: Authors', based on the African Development Bank (ADB/AfDB) Statistics, (2016)

Figure 4.4 below shows Trade Performance Indices of Zambia displayed on the bars correspond to the country's global rankings among other countries that export the same category of products. The index and change in world

market share index are the world country ranking for the sector under review. Note that only sectors with more than 1 US\$ Million exports were considered. Figure 4.4 below shows that Zambia's Basic manufactures relatively

performs well considering the size of the economy in the global arena. Basic manufactures as classified under the HS4 category is the leading export product category in Zambia.

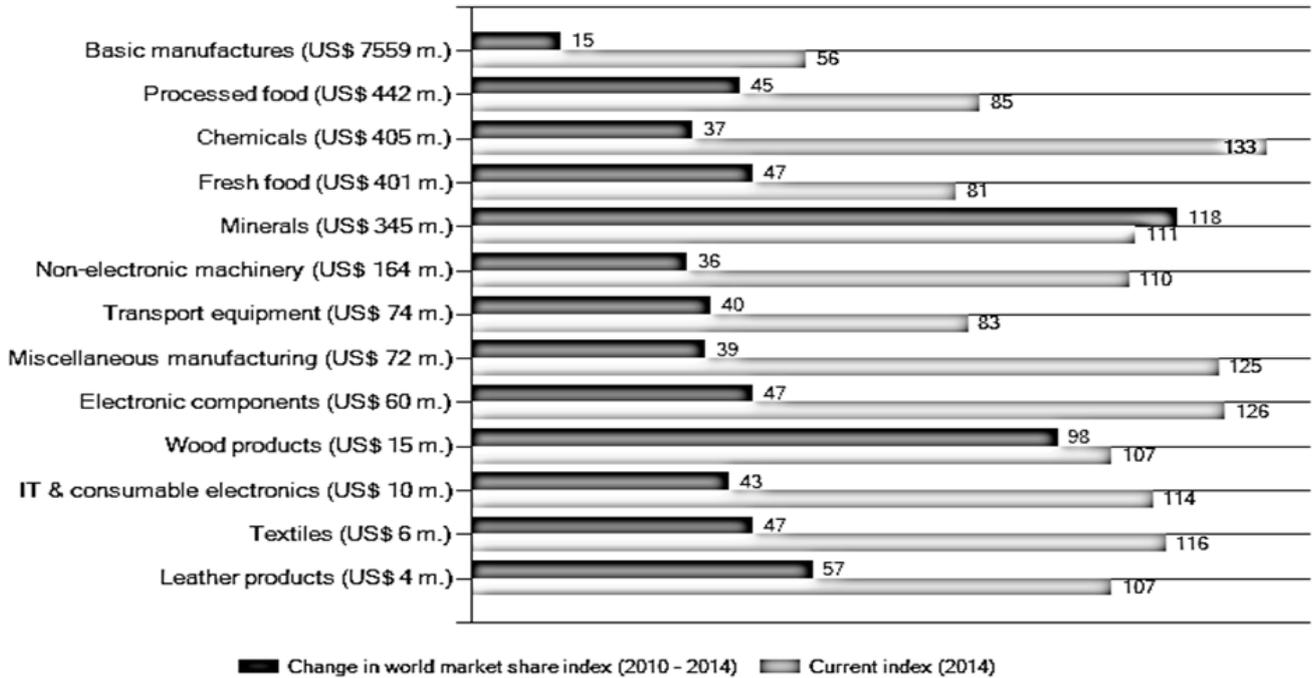


Figure 4.4. Trade Performances Index of Zambia

Source: ICT Trade Competitive Map, 2016.

**4.1.3. Zambia's Comparative Trade Performance with China**

Contrary to popular media and Sino-Africa discourse on China's trade with Africa, Zambia has been recording a trade surplus with China. Trade statistics from UNCTAD indicate that beginning 2005, Zambia has had trade surpluses with China, having recorded a US\$ 2, 106, 038.3 million in 2014. This trend has been growing until

recently due to the declining economic growth and Chinese demand for Zambian exports. Even then, the difference is still relatively high. Also, Chinese exports to Zambia have also been steadily increasing, though not as fast as the Zambian exports to China. As can be seen from the figure (4.5) below, by 2014, while Zambian exports to China had plummeted, Chinese exports to Zambia almost maintained the same growth.

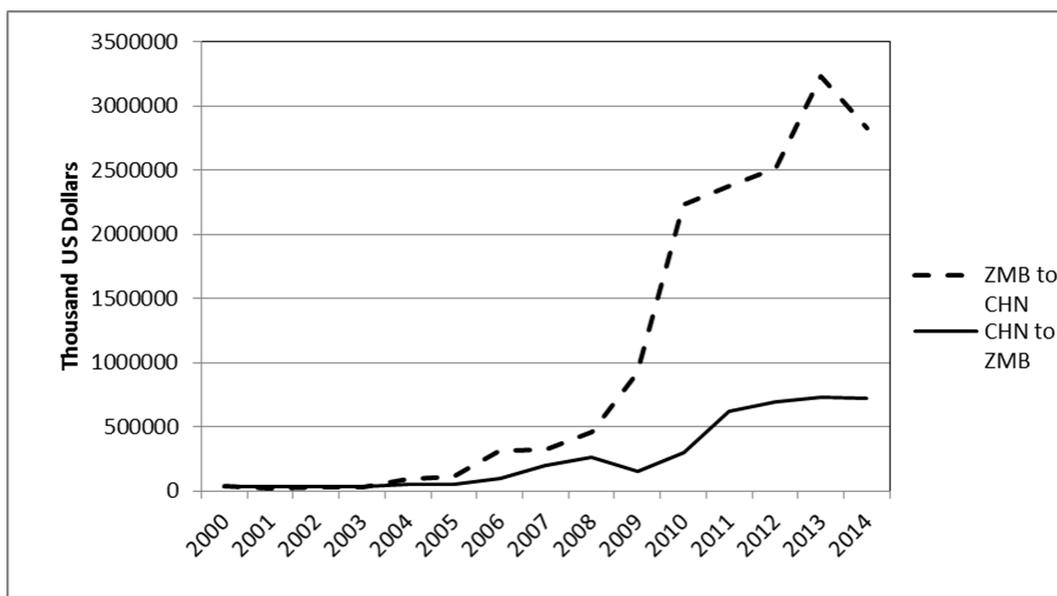


Figure 4.5. Sino-Zambia Bilateral Merchandise Trade (Expressed in thousands dollars)

Source: Author's based on UNCTAD Trade Statistics

Note: data was computed based on merchandise trade by trading partner and product based on three digit level SITC Revision 3 commodity classification

#### 4.1.4. Trade Intensity Index

The trade intensity index (T) is a measure used to determine whether the value of trade between two countries is greater or smaller than would be expected on the basis of their importance in world trade. It is defined as the share of one country's exports going to a partner divided by the share of world exports going to the partner (World Bank, 2016). It is calculated as:

$$T_{ij} = (x_{ij} / X_{it}) / (x_{wj} / X_{wt}) \quad (7)$$

Where  $x_{ij}$  and  $x_{wj}$  are the values of country  $i$ 's exports and of world exports to country  $j$  and where  $X_{it}$  and  $X_{wt}$  are country  $i$ 's total exports and total world exports respectively. An index of more (less) than one indicates a bilateral trade flow that is larger (smaller) than expected given the partner country's importance in world trade.

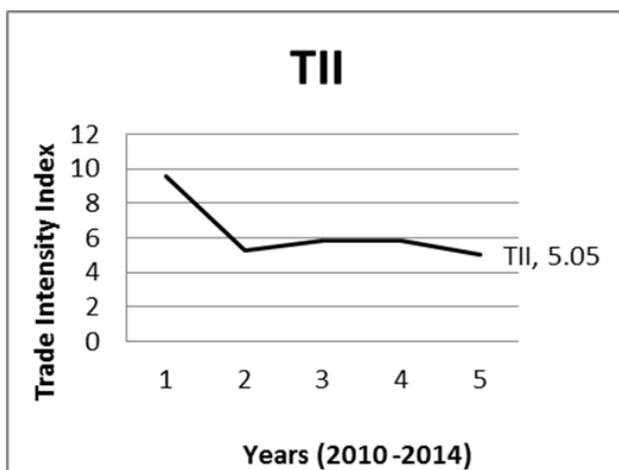
**Table 4.3. Tabulated Zambia's Trade Index with China (2010-2014)**

Year	2010	2011	2012	2013	2014
Zambia's Exports to China ( $x_{ij}$ )	1,455,428	1,504,569	1,799,145	2,256,991	1,790,764
Zambia's total exports ( $X_{it}$ )	7,200,267	9,000,946	9,364,653	10,594,069	9,687,918
China's total Imports ( $x_{wj}$ )	1,396,001,600	1,743,394,900	1,818,199,200	1,949,992,315	1,958,021,301
World total exports ( $X_{wt}$ )	15,057,105,841	18,066,514,928	18,202,308,765	18,684,466,211	18,686,070,183
<b>Trade Intensity Index (<math>T_{ij}</math>)</b>	<b>9.61</b>	<b>5.31</b>	<b>5.81</b>	<b>5.85</b>	<b>5.05</b>

Source: Author's calculations based on ITC data (based on UN COMTRADE statistics), 2016.

Note: values are expressed in US Dollars based on HS4 product category.

Table 4.3 above presents stunning results of Zambia's Trade Intensity Index with China. As revealed by the calculations above, the Sino-Zambia bilateral trade Intensity Index is very high, higher than expected given China's importance in international trade and the size of the Zambian economy. From 2010 through 2014, the Trade Intensity between Zambia and China was above 5, indicating a high trade dependence Zambia has on China. China, being a global player, any changes on the Chinese economy affects Zambia's trade and economic growth. This puts the Zambian economy at a very fragile position. For example, in the first quarter of 2015, Chinese investment to Africa plunged by 84 percent, and as a result of the slowing Chinese economy, having declined from 7.4 percent in 2014 to 6.9 percent in the 3<sup>rd</sup> quarter of 2015, imports from China declined 21 percent and exports declined by 4 percent<sup>19,20</sup>. As figure 4.6 shows below, the trade intensity between the two countries has been declining, though, relatively still very high.



**Figure 4.6. Sino-Zambia Trade Intensity Trend**

Source: authors' own, based on Zambia's Trade Intensity Index with China, 2016.

<sup>19</sup> <https://theconversation.com/chinas-economic-slowdown-threatens-african-progress-49544>

<sup>20</sup> <http://blogs.nottingham.ac.uk/chinapolicyinstitute/2015/12/17/chinese-neo-colonialism-in-africa-a-bien-pensant-political-ploy/> accessed on 14/04/2016

#### 4.1.5. Bilateral Trade Shares as a Percentage of the Total Merchandize Trade

Table 4.4 below shows bilateral trade shares between Zambia and China for the 2010, 2013 and 2014 period. We only included the top 5 product categories under the HS4 classification. The table shows the computed bilateral trade shares to the total imports/exports. It was observed that China's exports to Zambia are relatively diverse and mostly manufactured products. For example, machinery, nuclear reactors, boilers (HS4 '84) accounted for an average share of 24.97 percent from 2010 to 2014 as a major contributor to the total exports to Zambia. When compared to Zambia's exports to China during the same period, a marked difference is observed in the structure and pattern of commodities. Zambia's exports to China are highly concentrated on one major product category. A careful observation indicates that all the top 5 product categories to China can be classified as raw/primary commodities, a major concern for many development practitioners in the developing world, arguing that terms of trade of these commodities often favor the developed countries who in turn export finished products to the developing countries. Copper and articles thereof (HS4 74) consistently accounted for more than 90 percent from 2012 to 2014 with 96 percent of the total exports to China.

A closer look at the statistics presented on Table 4.4 below triggers the natural resource factor that has been used to justify claims that China exhibits colonialist tendencies exhibited by former African colonialists in their quest for her abundant natural resources. Using the Observatory of Economic Complexity (OEC) data<sup>21</sup> search, it was noticed that as of 2013, China was the largest importer of refined copper HS92. In the same year, total refined copper stood at 71 billion US\$, of this, Zambia contributed about 9.4 percent with 6.66 billion US\$ after Chile's 27 percent. Of Zambia's 9.4 percent, 15 percent headed to China, second only to Switzerland accounting for 57 percent of the total refined copper exports from Zambia. As of raw copper, during the same year, Zambia contributed about 18 percent of the total

<sup>21</sup> [http://atlas.media.mit.edu/en/visualize/tree\\_map/hs92/export/zmb/show/7402/2013/](http://atlas.media.mit.edu/en/visualize/tree_map/hs92/export/zmb/show/7402/2013/) accessed on 15/04/2016 at 4:52pm

world exports in raw copper, second to Chile's 38 percent. Of Zambia's 18 percent raw copper exports, the Observatory of Economic Complexity (CEO) reports that

95 percent was imported by China and 5.1 percent by India.

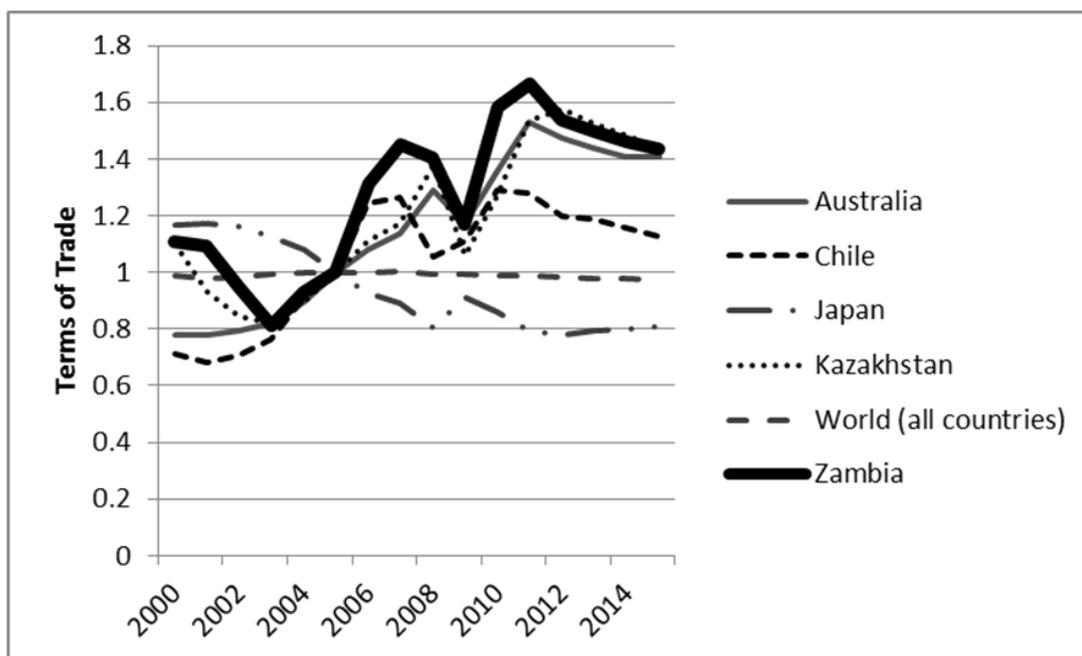
**Table 4.4. Bilateral Trade Shares as a Percentage of the Total Merchandize Trade**

Zambia's imports from China (percentage of total)				China's Imports from Zambia (percentage of total)			
	2012	2013	2014	2012	2013	2014	
Machinery, nuclear reactors, boilers, etc	23	28.7	23.2	Copper and articles thereof	91.5	93.5	96.0
Electrical, electronic equipment	11.5	15.1	19.0	Wood and articles of wood, wood charcoal	0.2	0.2	0.3
Vehicles other than railway, tramway	6.0	9.6	0.9	Cotton	0.1	0.04	0.3
Articles of iron or steel	9.9	13.8	15.3	Ores, slag and ash	0.5	0.88	0.6
Fertilizers	0.6	2.1	5.4	Raw hides and skins (other than furskins) and leather	0.03	0.01	0.05

Source: Authors' calculations based on ITC Trade statistics, 2016.

The argument from many development commentators that the terms of trade of developing countries deteriorate due to specialization in exporting raw commodities is not supported by our Zambia findings. At least, on aggregate, developing countries' terms of trade deteriorate. Theoretically, our findings indicate that Zambia has been benefiting from trade liberalization, especially with increased trade with China. However, whether this trade translates into economic development, an all-inclusive development that contributes to poverty reduction and that

reduces inequality is another issue. In the context of increased trade with China, a nascent concern about trade's contribution to welfare is gaining foot. Below is a graph (Figure 4.7) depicting the performance of Zambia's terms of trade relative to other major copper exporters to China. Clearly, it can be observed that Zambia's terms of trade have been performing well, above world average and even than other major copper exporters. Figure 4.7 below shows Zambia's terms of trade relative to the world's and select major copper exports.



**Figure 4.7. Zambia's Terms of Trade Relative to Other major Copper Exporters**

Source: DataMarket (<https://datamarket.com/data/set/1xsq/terms-of-trade#!ds=1xsq!20nd=2g.1g.5z&display=line>), provided by the World Bank, 2016.

Figure 4.8 below shows the trends in the growth rate of China's imports from Zambia measured in millions of US Dollars of mechanize trade relative to Zambia's terms of trade from 2001 to 2013. Stylized graph below (Figure 4.8) shows that the pattern of growth rate in Zambia's exports to China slightly follows that of her (Zambia) terms of trade especially during three episodes; 2003-2005, 2005-2006 and 2009-2010. This then suggests that trade with China has helped Zambia's terms of trade record as can be observed that a slight increase in the growth of exports to China matches with an improvement in the terms of trade for Zambia. This follows the trade surpluses Zambia has had with China during the latter part of the period under review.

Our findings are consistent with Assefa [12] and Zafar [89] that the structure of Zambia's trade with China (also, Sino-Africa) closely follows the expectation from the comparative advantage and predictions of the Heckscher-Ohlin Model, Zambia exporting primary commodities and China exporting manufactured products. This, we advance that has some implications on Zambia's diversification and industrialization efforts. Experience tells us that reliance on primary commodities is not strategic, especially when dominated by a single product category, as is with Zambia, though the export portfolio has been diversifying at a rather slower rate. This is so because the prices of, say copper, are volatile on the international commodity market. As a solution to these resource-rich,

yet “poor” countries, or as often called in academic literature, “resource curse”, Zafar [89] advanced that African countries need to maintain fiscal prudence and avoid wasteful public expenditure by using windfalls to accumulate foreign exchange reserves. He encourages savings and setting up stabilization funds during periods of booms. He further proposes a prudent use of monetary

policy to contain inflationary tendencies that result from commodity booms. We agree with his prepositions, however, we also stress on the need to reform the international trade architecture to ensure that developing countries benefit from trade. We are aware of some efforts being made, but more could still be done.

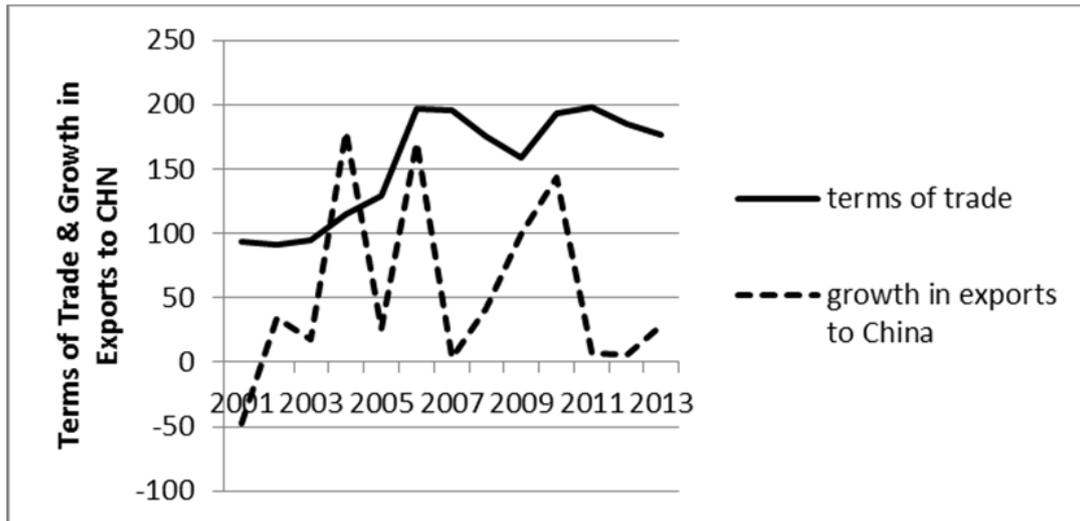


Figure 4.8. Zambia's Terms of Trade and Growth in Exports to China (2011-2013)

Source: Author's own calculations based on UNCTAD and the Global Economy, 2016.

## 4.2. Part B: Empirical Analysis

### 4.2.1. Determinants of Sino-Zambia Bilateral Trade

The gravity model has been widely used in the applied literature to evaluate the impact of regional agreements and the border effect on trade flows [9]. In its basic form, the gravity model of bilateral trade hypothesizes that exports between two countries are proportional to their economic mass (measured by GDP and population size) and inversely proportional to the distance between them. This then means that, theoretically, GDP, population and distance determine bilateral trade between countries and/or groups of countries; with GDP expected to have a positive effect on trade. Following the development of the gravity model of international trade, several empirical studies have been conducted to assess the trade situation of countries. More recently, with the evolution of trade and an increase in south-south trade more studies have been conducted on the determinants of trade in the developing world.

From Zambia's Trade Intensity Index with China (on Table 4.3, page 54 above), it was found out that Zambia has a very high trade intensity with China, averaging above 5 between 2010 and 2014. This implies the high trade dependence Zambia has on China. It therefore becomes imperative to know what really determines this trade relation between the two countries. The following section presents the empirical findings of what determines Zambia's bilateral trade with China and later, generally with other partners.

#### 4.2.1.1. Regression Results

Equation (6) was first run using the Ordinary Least Squares (OLS) method to examine the determinants of Sino-Zambia bilateral trade flows. With this method, due

to the problem of multicollinearity among the variables used, dummy variables were omitted. Further, the same equation (6) was run using the Random-effects Poisson Regression method with an addition of four more variables (population for both Zambia and China and FDI stock for both China and Zambia). Table 4.5 below presents the regression results with Random-effects Poisson Regression results presented under column (1) and the Ordinary Least Squares under column (2).

Table 4.5. Regression Results for the determinants of Zambia-China Bilateral Trade

VARIABLES	Random-effects Poisson Regression	OLS Regression
	(1) Export <sub>ij</sub>	(2) Export <sub>ij</sub>
gdp <sub>i</sub>	0.272*** (0.00182)	6.57e+07*** (1.11e+07)
gdppc <sub>i</sub>	-0.00146*** (2.29e-05)	-6.55e+07*** (1.08e+07)
gdp <sub>j</sub>	-0.00221*** (4.32e-06)	-2.35e+07*** (3946628)
gdppc <sub>j</sub>	0.000114*** (4.24e-06)	7249654*** (1567928)
pop <sub>i</sub>	10.43*** (0.0259)	
pop <sub>j</sub>	-0.130*** (0.000743)	
Fdi <sub>i</sub>	0.285*** (-0.00186)	
Fdi <sub>j</sub>	0.00384*** (-2.29E-05)	
Constant	76.48*** (0.713)	4.35e+08*** (7.41e+07)
Observations	15	15
R-squared		0.9856
Adj R-squared		0.9748

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Note: country (i) is Zambia and country (j) is China.

From Table 4.5, column (1) above, we can observe that what determines Zambia's trade with China are: Zambia's GDP, such that when other factors are held constant, a unit increase in GDP will lead to Zambia's exports to China rise by 27%. This is consistent with the gravity equation theory. The coefficient for this variable is positive and statistically significant at 99.9 percent significance level. This result suggests that Zambia's GDP is a key determinant of the country's capacity to export to China. A higher GDP means a higher production capacity which translates into exports. As such, activities which contribute to GDP are encouraged for Zambia to be able to export more to China. This finding is consistent with many other studies applying the gravity equation, for example Adekunle and Waanjiru [3]; Elmorsy [34]; Didier and Hoarau [30]. These studies all found the GDP for exporter countries to be positive and significant.

Zambia's population is also found to be positive and significant at 99.9 percent level of significance. Intuitively, this signals the importance of labor force in economic activities leading to increased GDP.

Zambia's FDI stock was also positive and statistically significant at 99.9 percent level of confidence. For FDI stock, our findings are consistent with other Sino-African studies which also indicated that FDI, especially Chinese FDI promoted African exports to China, for example Adekunle [3] and Drummond and Liu [31].

Further, the coefficient for China's GDP Per Capita was found to be statistically insignificant but positively correlated with Zambia's trade with China. This signifies that increased income in China leads to increased demand for imports from Zambia. Surprisingly, FDI stock in China was found to have a positive but insignificant influence on Zambia's trade with China. Investments in China are closely related to the growth of imports from Zambia, especially that Zambia mainly exports primary commodities demanded by China. This is consistent with Hailu [41]'s findings that FDI was positive and statistically significant in influencing African exports to China such that a 1 percent increase in FDI in the previous year brings about 0.043 percent increases in export of the next period. Also, for example, Drummond and Liu [31] found out that a 1 percentage point increase (decline) in China's domestic investment growth is associated with an average 0.6 percentage point increase (decline) in SSA countries' export growth and that this impact is larger for resource-rich countries such as Zambia. This implies that China's economic growth has an indirect impact on SSA's trade through price effects.

However, contrary to the economic theory, China's GDP was found to be negative though insignificant; implying that for every increase in Chinese GDP, Zambian exports to China would decrease by 0.00221 units. This could be a depiction of the reality of Zambian exports given their nature in terms of product composition. Zambian exports are highly concentrated, consisting of mainly mineral products, especially copper and cobalt. One key finding of Foad [38]' study was that access to markets and securing raw materials determined China's trade with African Countries. This then signifies that, contrary to the prediction of the gravity model, China's GDP does not matter as China is interested in securing the raw materials for her local production demands. Our findings are consistent with other studies which have also

found out that China's GDP portrays a negative influence on China's trade with African Countries. For example, Adekunle [3]: for the study of bilateral trade between China and Sub-Saharan African countries, the GDPs, FDI, GDP per capita and the exchange rate of Sub-Saharan countries had a positive and significant influence on their trade with China. However, when grouped into oil-rich and non-oil-rich countries, China's GDP was found to be negatively correlated with the non-oil-rich Sub-Saharan countries but positively related to the oil-rich African countries. This was also similar to Mukiibi [69]'s where the GDP and GDP per capita for Uganda's trade partners were insignificant and negative, respectively. Similarly, in a study of BRICs trade with African Countries, Didier and Hoarau [30], when estimated individually, the GDPs of African exporters were significantly positive. However, concerning the GDPs of importing countries, only the GDPs of Brazil and India conformed to the theory, meaning that the GDP for China was negative. In theory, this is unusual but it reflects the realities of African trade with China. Additionally, China's population was found to be negative and statistically insignificant in influencing the bilateral trade between Zambia and China.

Column (2) on table 4.5 above presents OLS regression results on the determinants of bilateral trade between Zambia and China. The results are consistent with the Random-effects Poisson Regression results presented on column (1) the same table above (4.5) in terms of estimation signs for the coefficients albeit varying magnitudes in influencing the bilateral trade between the two countries. For example, the regression results show that the effect of Zambia's GDP per capita income was negative and statistically significant at the 99.9 percent level under the GLS regression method with a coefficient of 6.5 percent while the Random-effects Poisson regression method had a coefficient of Zambia's GDPPC of -0.00146 units at 99.9 percent significance level. This implies that an increase in Zambia's GDP per capita income raises the absorption capacity of the domestic market, resulting into lower exports. This result is consistent with the findings of Karamuriro and Karukuza [60]. In a study of the determinants of Uganda's export performance, these authors found that a higher GDP per capita of Uganda reduced the export performance of Uganda's exports.

It is also interesting to see how these results would change when China is grouped together along with other major trade partners of Zambia. As such, the gravity model in Equation (6) was first estimated using fixed effects regression and random effects regression and OLS regression, respectively. The Hausman test was then applied to check whether the fixed effects model was more efficient than the random effects model. The Hausman test statistic suggested that the fixed effects regression was more efficient than the random effects regression. Table 4.6 below presents the empirical results.

From Table 4.6, in relation to the determinants of Zambia's foreign trade, the regression results indicate that Zambia's GDP, GDP per capita, Population, and FDI stock and partners' GDP and GDP per capita are statistically insignificant and render no further explanation for all the three estimation methods used (OLS, Fixed and Random Effects) except for the partner GDP and population under the fixed effects methods at 95 percent

significance level. This shows that for every unit change increase in partners' GDP, Zambia's exports increase by 0.000195 units. The Hausman test indicated a result of  $\chi^2=0.000$ , less than  $\chi^2=0.05$ , therefore, we adopted the fixed effects methods for the analysis of Zambia's trade with partners albeit the other methods will also be used for the other variables which were not captured by the fixed effects.

**Table 4.6. Determinants of Zambia's bilateral trade (14 sampled major partners)**

VARIABLES	(1)	(2)	(3)
	ols lexport	fe lexport	re lexport
gdp_i	-0.00618 (-0.059)	-0.0119 (-0.156)	-0.00618 (-0.059)
lgdppc_i	0.369 (0.484)	0.765 (1.282)	0.369 (0.484)
gdp_j	-1.09e-05 (-0.164)	0.000195** (2.120)	-1.09e-05 (-0.164)
lgdppc_j	-0.0309 (-0.149)	0.535 (0.968)	-0.0309 (-0.149)
pop_i	0.213 (0.434)	-0.0129 (-0.036)	0.213 (0.434)
lpopj	0.216 (1.118)	3.325*** (3.608)	0.216 (1.118)
fdi_i	-0.0908 (-0.185)	0.0772 (0.215)	-0.0908 (-0.185)
lfidj	0.601*** (5.564)	-0.186* (-1.681)	0.601*** (5.564)
ldistance	-1.766*** (-4.052)		-1.766*** (-4.052)
lang	-1.947*** (-4.943)		-1.947*** (-4.943)
colony	1.542*** (2.672)		1.542*** (2.672)
border	-1.262* (-1.967)		-1.262** (-1.967)
rta	2.442*** (3.563)		2.442*** (3.563)
pta	0.987* (1.950)		0.987* (1.950)
Constant	19.13** (2.459)	-10.86* (-1.664)	19.13** (2.459)
Hausman test		Chi2(7)=164.93 Prob>chi2=0.000	
Observations	193	193	193
R-squared	0.509	0.382	
Number of id		14	14

t-statistics in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Further, partner population is positively related to Zambia's trade and statistically significant such that for every unit increase, Zambia's exports respond by an increase in exports by 3.3 percent. This was only observed under the fixed effects methods while with the OLS and the random effects the coefficient was insignificant. Partner FDI stocks also were positive and significant for the OLS and Random effect methods showing an elasticity unit of 6 percent. Distance is consistent with the theory, indicating that the farther the partner is, the more costly it becomes to trade with. This implies that for every unit increase in distance, trade reduces by 1.8 percent. However, the dummy variables for language and border

are negatively related to Zambia's trade albeit with relatively small magnitudes. This implies an existence of trade barriers, especially behind the border measures. Regional Trade Agreements (RTAs) and Preferential Trade (PTAs) significantly determine Zambia's trade with partners, with PTA showing a coefficient of 0.98 units. OLS estimation results are consistent with the random effects method. This shows that regional trade arrangement should be supported and fully utilized to promote trade and development among the member countries. This is contrary to the observed trends that Zambia trades relatively less with regional members than far countries like China.

#### 4.2.2. Zambia's Trade Potential with Selected Partners Relative to China's

Having investigated what determines Sino-Zambia bilateral trade and Zambia's trade with the other partners, it is also imperative to determine whether there is any potential for continued trade between the two countries. From the estimates of the determinants of trade between Zambia and the top 7 trade partners, based on the estimates for the gravity model, we computed the trade potential for Zambia and these countries. The method of calculation is given below:

$$\text{Trade potential} = \frac{\left\{ \frac{\text{Actual}}{\text{Predicted Exports}} \right\}^{-1}}{\left\{ \frac{\text{Actual}}{\text{Predicted Exports}} \right\}^{+1}} \quad (8)$$

$\left( \begin{array}{c} - \\ + \end{array} \right)$  Used to standardize the exports

Note: 1. (0, 1) = higher than predicted; reached potential  
2. (-1, 0) = trade potential exists

Figure 4.9 below shows the general trend in Zambia's trade potential with China. We can see on the graph below that the potential for trade was declining beginning 2001 with a potential of -0.95 vanishing to -0.07 by 2013 before improving to -0.17 in 2014.

Table 4.7 below shows Zambia's trade potentials with top 7 sampled partners, relative to China's. In comparative terms, Switzerland has the highest average trade potential with Zambia, with a potential of -1, followed by the Congo DR with -0.99. China, among the 7 sampled countries, is the number 4 most potential country Zambia could trade with, on average. This signifies unrealized opportunities for deepened trade between the two countries. Zimbabwe, despite sharing a border with Zambia, sharing the same colonial history and using the same official language, in addition to belonging to two Regional Trade Agreements, has the least potential for trade. This is contrary to the predictions of the gravity model. There are two immediate inferences from this; the first one is that the potential is being depleted or that the countries are trading beyond the potential, in other words, they are over trading. The other one is that the two countries are similarly endowed with natural resources, they all do not have adequate capacity to further process them, as such, and they have to trade with other countries where their similar raw commodities are demanded like China, Switzerland and the Singapore, just as an example.

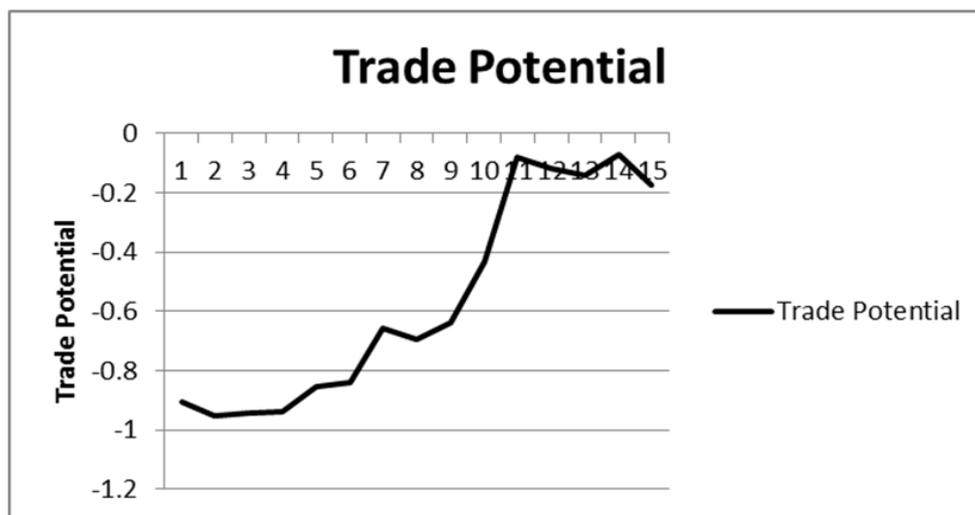


Figure 4.9. Zambia's Trade Potential with China (2000-2014)

Source: Author's own calculations, 2016.

Table 4.7. Relative Average Trade Potentials (2000-2014)

No.	Country	Trade Potential
1	Switzerland	-1
2	Congo DR	-0.99
3	United Arab Emirates	-0.96
4	China	-0.93
5	South Africa	-0.92
6	Singapore	-0.80
7	Zimbabwe	-0.77

Source: Author's own Calculations, 2016.

One interesting finding is that Zambia still has potential for continued trade with all the top 7 trading partners. This should be an incentive for the Zambian government to further promote trade especially with China, given the trade preferences Zambia receives under the Forum on China-Africa Cooperation and the good bilateral relations the two enjoy. This calls for consented efforts in addressing barriers to trade even as measures towards diversification are scaled up.

### 4.3. Chapter Summary

This chapter presented the trends in Sino-Zambia bilateral trade in the context of Zambia's overall foreign trade. Trends in Sino-Zambia relations were also presented. It has been found that Sino-Zambia relations (trade, economic and political) have gradually deepened, more with the establishment of FOCAC in the early 2000s. Zambia's exports to China are still concentrated on a few commodity products while China's exports to Zambia are relatively diverse and constituting of manufactured products.

The empirical results of this study indicated that Zambia's GDP, Population and the stock of FDI and China's GDP per capita and Population are the key determinants of Sino-Zambia Bilateral Trade. When China is regressed together with other partners, partner GDP, FDI, RTA and PTA; show that they are the key determinants of Zambia's foreign bilateral trade. The next chapter gives the conclusion for this present study; policy

implications and recommendation are also given in the same chapter.

## 5. Conclusion and Recommendations

### 5.1. Paper Summary

In trying to understand Sino-Zambia Trade Relations, this paper examined trends, determinants of Zambia's trade with China, and whether Zambia still has trade potential with China relative to other partners. Trend analysis based on trade indicators and the traditional gravity model of International were used for the analysis covering 15 countries over a period 2000-2014 on panel data.

The analysis revealed that bilateral relations between Zambia and China have been growing rapidly, both in scope and importance as evidenced by the increased trade and investments between the two countries. Common variables used in Sino-Africa bilateral trade analysis such as GDP and FDI were consistent with the findings of this study, signifying that Sino-Zambia bilateral trade relations follow Sino-African trade relations.

Over the years, in terms of Zambia's trade structure by destination (partner), there has been an observed trade diversion away from Zambia's traditional trade partners and trade creation tilting towards China as evidenced by the very high Trade Intensity index and estimated Trade Potential relative to traditional partners such that by 2014, China accounted for 29 percent of Zambia's total merchandise trade having only accounted for 4.8 percent in 2000. In terms of export portfolio, it was observed that Zambia's exports to China are still concentrated on a few commodity products, accounting for an average share of 75.8 between 2010 and 2014, of this copper cathodes and sections of cathodes unwrought accounting for over 90 percent during the same period.

In terms of export performance, however, there was an observed improvement with regards to the number of products having improved to 199 in 2014 from 119 in 2000 and the concentration index only dropping by a slight margin from 0.64 in 2007 to 0.61 in 2014. The basic

manufacture sector, consisting of copper products has been relatively performing well on the international scale.

Contrary to the general perception that Sub-Saharan Africa has been witnessing deteriorating terms of trade as a result of increased unbalanced trade with China, Zambia has been enjoying a trade surplus with China for the later period under investigation, seeing her (Zambia) terms of trade relatively perform well compared to the world average, and even other major copper exporters. Chinese exports to Zambia have also been increasing steadily such that by 2014, machinery, nuclear reactors and electrical equipment accounted for 23.2 percent and 19 percent as a share of Zambia's imports from China relative to the total merchandize trade.

Our empirical results indicate that Zambia's GDP, population and the stock of investment positively and significantly determine Zambia's trade with China. Further, China's GDP per capita and FDI also have a positive influence on Sino-Zambia bilateral trade. The results also indicated that, when China is regressed together with the other partners, using the fixed effects estimation method, only partner GDP and population determine Zambia's bilateral trade. FDI stock, RTA and PTA also showed positive coefficients in influencing Zambia's trade while distance, border, and language were found to have a negative influence on Zambia's trade under the OLS and Random effects estimation methods. This signifies an existence of trade barriers.

## 5.2. Policy Implications

The random and OLS regression results for Zambia and partners indicated that there exist trade barriers. This is also consistent with Brulhart, Dihel and Kukenove [18] study which found out that Zambia's exchange rate volatility and difficulty access to imported inputs significantly inhibit diversified and stable exports. Trade barriers such as complicated administrative procedures as well as behind the border measures prevent Zambia from realizing the full potential trade opportunities which exist with most partners. This present study found out that Zambia has huge trade potential with China yet; trade is not as it is supposed to be. This has policy implications, requiring the redesigning of trade and investment policies to ensure that trade barriers are significantly reduced if the two countries were to benefit from enhanced trade between them. For example, Brulhart, et al, [18] found that Zambian agricultural exporters face regulatory costs through regulatory measures as phytosanitary, non-GMO and fumigation certificates among others. Brulhart, Dihel and Kukenove [18] and Arvis et al, (2015) further found out that the costs of exporting agricultural and manufacturing products from Zambia to key markets such as China, Japan, USA, and Germany are consistently higher than those for neighbors such as Malawi, Mozambique and Tanzania among others, yet trade with these very countries, as our stylized facts indicate, is very minimal. This therefore requires that Zambia addresses these issues by designing consistent and appropriate policies to be able to further benefit from the high trade potential with China.

Regional Trade Agreements showed a positive influence on Zambia's foreign trade, albeit this is contrary to the results from the trend analysis which showed that

Zambia trades relatively less with countries in the same regional trade blocks compared to countries like China and Switzerland. We understand, however, that this may be as a result of the nature of the export products of these countries (primary commodities). This may also indicate constraints to trade within these regional trade blocks. This calls for the intensification of trade facilitation programs so as to enhance trade especially that results indicated that Zambia still has potential for further trade with these countries.

## 5.3. Recommendations

### 5.3.1. Policy Direction

- i. There is need for the Government of Zambia to design consistent and appropriate policies to reduce trade barriers. The elimination of barriers can improve Zambia's bilateral trade; however, such measures should be able to take into account nascent industries in the context of global competition so as not to hamper on Zambia's export diversification efforts.
- ii. There is urgent need to investment in infrastructure development, especially transport and communications and power generation as this would increase economic activities leading to increased GDP and the subsequent export performance.
- iii. There is need to strategically restructure/strengthen local institutions and create an enabling environment for foreign direct investment, especially in the agricultural, infrastructure, manufacturing and tourism sectors. This is cardinal for the diversification and development of a resilient exports sector. This is core even as China now places emphasis on the "Go Global Strategy". Zambia can strategically position herself and attract the attention of Chinese investors.
- iv. Special attention should be paid to the distributional effects of trade gains so as to improve on human development and a sustainable society. Therefore, trade policy should be closely linked to sustainable economic development.
- v. Given the higher trade intensity index and trade potential Zambia has with China, Zambia should take advantage of the preferential trade treatment from China by widening the export portfolio while extend tax incentives on imports of manufacturing equipment from China to scale up diversification and industrialization processes.
- vi. Zambia presents China with investment opportunities especially in the areas of agriculture, infrastructure, manufacturing and tourism. Zambia is at the center of two regional blocks, the Southern Africa Development Community (SADC) and Common Market for Eastern and Southern Africa (COMESA). China can further exploit this market, albeit relatively small but promising given the projected population growth and high rate of urbanization as well as a relatively stable system compared to most African Countries.

### 5.3.2. Future Research Direction

Given the limitations of this study, which only looked at the trends and determinants of Sino-Zambia trade on aggregated panel data, we recommend that further detailed research (es) be instituted on the following broad areas:

- i. Economic impact of Zambia's trade with China on the Zambian economy
- ii. The likely impacts of the One Belt One Road Chinese Strategy on Sino-Zambia Bilateral trade
- iii. Market research on the product category demanded by Chinese consumers Zambia has potential in
- iv. Zambia's agricultural trade with China
- v. A detailed sectoral study on how Sino-Zambia trade can be enhanced.

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