China's Trade with Sub Saharan Africa:

Challenges and Opportunities for Growth-inducing Structural Change

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To Zoe and Noel

for their extraordinary kindness and support

when I most needed it... and always.

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LIST OF ABBREVIATIONS

AGOA	:	African Growth and Opportunities Act
DICT	:	Dynamic Index of Competitive Threat
DRC	:	Democratic Republic of Congo
FDI	:	Foreign Direct Investment
GATT`	:	General Agreement on Tariffs and Trade
HTM	:	High-Technology Manufactures
ISI	:	Import-substituting Industrialization
IT	:	Information Technology
LDC	:	Less Developed Countries
LIC	:	Low Income Countries
LTM	:	Low-technology Manufactures
MFA	:	Multi Fiber Agreement
MIC	:	Middle Income Countries
MVA	:	Manufacture Value Added
MTM	:	Medium-technology Manufactures
MX	:	Manufactured Exports
NDC	:	Now-developed Countries
PP	:	Primary Products
PPP	:	Purchasing Power Parity
RBM	:	Resource-based Manufactures

R&D	:	Research and Development
SACU	:	Southern Africa Customs Union
SICT	:	Static Index of Competitive Threat
SITC	:	Standard and International Trade Classification
SSA	:	Sub Saharan Africa
TFP	:	Total Factor Productivity
TNC	:	Transnational companies
TOT	:	Terms of Trade
TVE	:	Township and Village Enterprises
UN	:	United Nations
UNCTAD	:	United Nations Conference on Trade and Development
WDI	:	World Development Indicators
WTO	:	World Trade Organization
WV	:	Washington Consensus

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CHAPTER 1

INTRODUCTION

Sub Saharan Africa (SSA) has experienced promising GDP growth rates over the past decade partly due to the commodity price boom caused by China. Although some SSA countries have improved their GDP growth, historically, growth based on a spike in export prices of natural resources has not been sustained over long periods of time. Growth-inducing structural change, on the other hand, has been the driver of sustained growth according to the existing empirical evidence and the history of economic development.

As China's global importance has increased due to its double-digit growth rates of the past three decades and its huge market of 1.3 billion people, the Giant has increasingly played an important role for SSA, especially since China has opened up its economy. China's impacts may be transmitted to the domestic economies in SSA through six primary channels: trade, aid, foreign direct investment (FDI), global governance, migration, and environment (Kaplinsky, 2008). Although each channel is important in understanding the complex consequences of the Sino-African interaction, my study focuses on the trade channel due to the availability of data and the recent trade surge between China and SSA.

Through exploring trade, I aim to answer the following questions: How has the China-SSA trade structure evolved since China's accession to the World Trade Organization (WTO) in 2001? What threats and opportunities do the trade relations of the past decade pose for SSA? Do the Sino-African trade relations allow SSA to develop domestic industries that encourage growth-inducing structural change and lead to sustained growth? Or does China reinforce SSA's dependence on natural resource exports?

In order to examine the challenges and opportunities that the trade relations pose for SSA economies, I utilize a framework proposed by Raphael Kaplinsky (2008), which classifies the effects of the Sino-African trade relations into two groups: *complementary* effects - when both trade partners benefit, and *competitive* effects - when domestic production in Sub Saharan African economies is threatened by China. The *complementary* and *competitive* effects are further decomposed into *direct* and *indirect* effects. *Direct* impacts arise when countries directly interact with one another. *Indirect* impacts are those that result from China's relations with third countries, but that can still substantially affect SSA.

My main contribution lies in extending Kaplinsky's framework to encompass structural change and in investigating the changing technology composition of Sino-African trade over the past decade. Adding structural change to the framework demonstrates the complexity of China's effects. Analyzing the trade structure as well as trade trends gives an insight into the effects of the Sino-

African trade relations on the prospect of structural change. The findings are based on the bilateral trade data for 2000-2010 from UN Comtrade as well as the secondary literature in the field.

My findings show that even when China's impacts on SSA are classified as *complementary*, these effects do not automatically lead to growth-inducing structural change. The effects depend on the existing comparative advantage and economic structure of individual economies. Over the past decade, the Sino-African trade has reinforced SSA's dependence on exporting natural resources and the region's exports have been highly concentrated in a small number of resource-rich countries. These countries do not face Chinese competition, as their exports are vastly different to those of China. Yet, concentrating their exports in natural resources does not advance the structure of their economies towards high value-added production.

My study also shows that SSA countries with strong manufactured exports in 2000 were not able to take advantage of the market opportunities offered by China while they also faced a fierce competition in third markets as well as domestically. Imports from China have been significant in almost every SSA economy and they have been concentrated in manufactured products both at the beginning and at the end of the past decade. In third markets, China often outcompeted African exporters of technology-intensive goods since it joined the WTO. Overall, China has not facilitated SSA's movement from low value-added to high value-added production. However, the rents generated from commodity

exports, if captured by the governments, can be a valuable resource for building resilient economies.

The rest of the paper is structured as follows. Chapter 2 explores the importance of growth-inducing structural change for sustained growth. It outlines the benefits and the shortcomings of a developing country conforming to its comparative advantage, which usually lies in primary products (PP) and resource-based manufactures (RBM).[1] Chapter 2 also draws on concrete examples and evidence from the development history to show the importance of growth-inducing structural change. In Chapter 3, I briefly discuss the development and the structure of Sub Saharan Africa's economies, as this provides the necessary context for understanding the economic environment in which SSA trades with China as well as the importance of growth-inducing structural change for the region. In Chapter 4, I outline the channels through which China affects the region's prospects for sustained growth and I present the extended synthetic framework that will be used for the rest of the discussion. In Chapter 5, I analyze how the trade structure has evolved over the past decade. I examine SSA's export structure more closely by selecting two specific country groups - natural resource-exporters and manufactured good-exporters. I chose two country groups with very different resource endowments and economic structures in order to account for some of the diversity within the region. I find that China's effects vary substantially depending on a country's exports. I draw on my own findings and

[1] See Appendix 1 for Lall's (2000) technological classification of exports, which displays what constitutes PP and RBM.

the evidence from the existing literature to analyze China's effects on SSA within the synthetic framework proposed in Chapter 4. Chapter 6 draws a link between the findings in Chapter 5 and growth-inducing structural change. Chapter 7 presents conclusions, policy implications, and areas for further research.

CHAPTER 2

LITERATURE REVIEW

SUSTAINED ECONOMIC GROWTH AND STRUCTURAL CHANGE

Every country strives for sustained economic growth. The field of economic development has been trying to answer the pertinent question of *how* countries achieve this goal. Economists and politicians have presented and implemented a variety of development strategies with varying levels of success. A handful of countries have experienced impressive rates of growth while an overwhelming majority of developing countries have been unsuccessful at making significant progress. Although different sets of data and varied measurement methods can provide wide-ranging results (Sutcliffe, 2004), most empirical evidence shows that developing economies have experienced overall divergence[2], with a shift to convergence since 2002.[3]

It is impossible to come up with a single reason why some countries prospered while others lagged behind. However, when studying economic development success stories, the importance of growth-inducing structural change[4] undoubtedly appears as a crucial driver of sustained growth.[5] In order to

[2] The data allows us to go as far back as 1870s. For example, Pritchett (1997) used the data from 1870 - 1990 to show overall divergence in the period.
[3] Rodrink and McMillan (2011) show that there has been convergence since 2002.
[4] Hereafter referred to as "structural change" unless otherwise stated.

highlight the importance of structural change for long-term sustained growth, it is important to explore the consequences of maintaining the existing structure of the economy in developing countries as well as the history of economic development.

In this chapter, I will firstly outline the benefits and the shortcomings of concentrating production in PP and RBM, which is where most developing countries' comparative advantage lies. Although some economists argue that countries should conform to their comparative advantage, evidence shows that this approach can lead to deteriorating terms of trade (TOT) and greater vulnerability due to increased dependence on global demand and exposure to global price fluctuations. Secondly, I will analyze the importance of structural change for developing countries and I will review how it contributes to long-term development goals and how countries can achieve this shift. Thirdly, I will discuss parts of economic development history in order to understand how countries have achieved growth-inducing, and in some cases growth-reducing, structural change in the past. I will focus on import-substituting industrialization (ISI), the Washington Consensus (WC), lessons learned from the development path of the Now-Developed Countries (NDCs), and of successful developing countries. Lastly, I will sum up the framework that will be used in evaluating China's effect on the prospect of growth-inducing structural change of Sub-Saharan Africa.

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[5] Rodrik (2006) has been one the latest economists to advocate structural change, but the approach was first popularized as early as in the 1950s.

This chapter serves as a foundation for understanding the importance of structural change for developing countries, which allows me to explore China's effects on SSA through trade in subsequent chapters.

2.1 Comparative Advantage in Primary Products

Most developing countries' comparative advantage lies in PP and RBM. Orthodox economists focus on the importance of allocative efficiency and argue that countries should conform to producing these products and, with time, this will allow them to accumulate enough capital and labor to develop comparative advantage in higher value-added production such as manufacturing. However, concentrating production in PP and RBM is associated with deteriorating TOT and exposes the country to greater external shocks, such as crises and natural disasters. Moreover, PP and RBM do not naturally lead to a movement of capital and labor from agriculture to manufacturing, as orthodox economists may have suggested.

2.1.1 Advantages of Conforming to the Comparative Advantage in Primary Products and Resource-based Manufactures

David Ricardo's law of comparative advantage and the Heckscher-Ohlin (H-O) theory are the most widely accepted trade theories. Although there are some differences between the two theories, they both state that countries should focus on their comparative advantage, which will allow them to allocate resources

optimally. According to the theories, this approach is likely to benefit both importers and exporters (Lin and Chang, 2009; Ocampo and Parra, 2003).

Undoubtedly, there are certain benefits to focusing production on goods in the area of a country's comparative advantage. Lin (2010) argues that when developing countries focus on labor-intensive and / or resource-intensive production they are able to compete in both domestic and international markets. He claims that learning costs tend to be lower and surpluses earned - higher. As a result, countries slowly upgrade their endowment structure and consequently, they gradually move their production to higher value-added activities.

Furthermore, Kjöllerström and Dallto (2008) argue that sometimes, in developing countries, PP and RBM can be higher up the value chain than manufactured products, as many of the former products can be knowledge-intensive. The authors challenge the notion of the "natural resource curse"[6] claiming that a commodity boom can indeed lead to sustained growth and that agriculture has multiplier effects on the economy. At the same time, they emphasize the importance of increasing higher value-added production. Wright (2001 as cited in Kjöllerström and Dallto, 2008) claims that growth failures in countries that are endowed with natural resources can be attributed to policy choices rather than to resource endowments. Furthermore, Sala-i-Martin and Subramanian (2003 as cited in Kjöllerström and Dallto, 2008) analyze this question empirically finding that once "institutions are controlled for there is

[6] The "resource curse" hypothesis was developed by Sachs and Warner in 1999 (Kjöllerström and Dallto, 2008).

either very little effect of natural resources on growth or even a positive effect" (page 121).

Botswana is a strong example of how countries can leverage commodity booms to generate sustained growth. This relatively small African country used its diamond exports to settle on a growth trajectory with the purchasing power parity (PPP) adjusted GDP per capita growth of 8% in the 1965 - 1998 period, which is very high for the SSA region (Kjöllerström and Dallto, 2008, 121). The country mobilized and utilized its revenues from the diamond industry to contribute to the long-term growth of the economy.

Although, Botswana is a success story, the authors point out that in most African countries the pattern of natural resource specialization has been a "curse". Hence, it becomes evident that how countries utilize and invest the revenue obtained from exporting natural resources is a defining factor for whether natural resources become a curse or a savior of the domestic economy. Overall, there are very few countries that have followed Botswana's example and used the revenues from natural resources efficiently contributing to long-term development goals. This could explain why having natural resources is generally referred to as a "curse".

The comparative advantage theories and the arguments presented by Lin (2010) and Kjöllerström and Dallto (2008) ignore many of the problems associated with PP and RBM. Some of these issues are outlined below.

2.1.2 Challenges Generated by Conforming to the Comparative Advantage in Primary Products and Resource-based Manufactures

In 1950, Raúl Prebisch and Hans Singer argued that deteriorating TOT pose a huge challenge for developing countries.[7] They explained that as the North, which primarily specialized in manufacturing, increased its productivity levels, only the North benefited because the improvements in productivity did not translate into lower export prices. The South, which specialized in agricultural and natural resource production, experienced lower levels of productivity growth and a surplus of labor, which exerted downward pressure on wages. Moreover, according to Engel, the income elasticity of demand for PP and RBM in the North is less than one; so, as incomes increase in developed countries, this does not lead to price increases of agricultural products and raw materials. Also, when faced with downturns, the North responds with reduced employment and income, which results in reduced imports from developing countries. Overall, the prices of manufactured products stay high, while there is downward pressure on PP and RBM product prices leading to deteriorating TOT in developing countries (Bruton, 1998; Ocampo and Parra, 2003).

At the same time, producing mainly PP and RBM exposes developing economies to greater volatility because of the effects of external shocks, such as crises in developed countries (because of the dependence of PP and RBM on global demand and prices as well as the income elasticity of demand for their

[7] Deteriorating terms of trade is defined as a fall in the price of exports relative to the price of imports.

exports) and natural disasters (because agricultural production is highly dependent on weather). These external shocks are highly unpredictable and cannot be controlled by developing nations.

Furthermore, Rodrik & McMillan (2011) argue that minerals and natural resources do not lead to increased employment levels compared to manufacturing. While some activities in the mining sector can be high value-added, this sector does not absorb much labor. At the same time, it lacks backward and forward linkages into the economy, thus has limited spillover effects on the overall economy. Also, there is much less room for innovation in resource-based production and even less in primary product extraction and exports; thus, prospects of sustained growth stay limited in countries that concentrate their production in these fields. However, as Kjöllerström and Dallto (2008) argued, natural resources can present important economic opportunities for developing countries if they invest revenues obtained from exports in long-term development goals following Botswana's example.

Generally, conforming to the comparative advantage in PP and RBM and relying on the market to allocate resources does not necessarily lead to factor accumulation in manufacturing. Chang (2009) argues in his debate with Lin in the *Development Policy Review* that factor accumulation is not an "abstract process" (490). A country accumulates capital and labor in the specific industries in which it operates. As Chang points out, if a country wants to enter the automobile industry, it needs to accumulate the capital and labor for this specific industry.

Having machinery and a skill-set for textile or resource-based production is not going to help a country develop comparative advantage in the automobile industry even if it has the right capital-labor ratio for this industry. Although some skills may be transferable, industry-specific skilled labor is still essential for developing new industries. Similarly, capital needs to accumulate in terms of industry-specific technology.

It is evident that conforming to the existing comparative advantage can pose many problems for developing countries creating barriers to achieving sustained growth. In the next section, I will review how countries can overcome the difficulties discussed above.

2.2 Structural Change

Structural change is the movement of capital and labor from low value-added to high value-added production. Bruton (1998), Rodrik (2006, 2011), Chang (2003), and Chang and Lin (2009) argue that structural change is essential in helping developing countries overcome the deteriorating TOT and in achieving sustained growth. Unless they defy their comparative advantage, developing countries can be "stuck" with dependence on low-productivity, low value-added PP and RBM without much prospect for diversification and growth.

Traditionally, economists have described the process of achieving structural change as the movement from low-productivity agricultural production to high-productivity manufacturing allowing for diversification of production

(Rodrik, 2006, 2011; Chang and Lin, 2009). Generally, manufactured products are associated with increasing returns, unlike natural resources due to income elasticity of demand (Rodrik, 2006). The high returns from high value-added manufacturing can be used for reinvestment in further growth prospects.

In order to achieve a structural shift, producers need to have an opportunity to practice and learn how to manufacture goods. Traditionally, the government has facilitated this crucial learning process by protectionism so that, over time, the infant industries could gain enough expertise to increase productivity levels; as a result, countries developed a comparative advantage in new industries higher up the value chain with more resilience to external shocks. This shift in production also tends to allow countries to generate more employment. At the same time, countries are able to improve the balance of payments by exporting the less price-sensitive, high value-added goods.

Also, manufacturing is associated with higher spillovers on the economy, which contributes to the development process. Overall, historically, infant industry protection has allowed countries to diversify their production. Diversification is generally associated with lower levels of risk. Rodrik (2006) highlights the importance of policies that ensure that growth is maintained through "ongoing diversification into new areas of tradables" (985). Baliamoune-Lutz and Ndikumana (2007) also affirm the importance of diversification. They state that in order to gain from trade liberalization, a country must have an industrial strategy fostering economic diversification. Their study, which focuses

on African countries, finds that "diversification enhances the growth effects of increased openness" (Baliamoune-Lutz and Ndikumana, 2007, 13).

As domestic production becomes more diversified and domestic industries strengthen, they are more likely to compete in the world market and take advantage of open trade without the threat of facing unequal competition from companies that have an extended experience in the field and are usually managed by or based in a developed country. Also, with higher levels of knowledge and technology, producers are more likely to benefit from positive spillovers from FDI. So, with a strong manufacturing sector, countries settle on a growth trajectory by being able to compete in and benefit from today's globalized context. Thus, structural change allows economies to replicate the experience of rich countries and achieve higher levels of growth that can be sustained.

However, based on Kjöllerström and Dallto's (2008) argument, the traditional notion of structural change, as a movement from agriculture to manufacturing, can be challenged. It is important to note that there is large potential for structural change even within the agricultural sector itself: this would be considered as "vertical" rather than "horizontal" structural change. For example, countries can move from producing normal coffee to highly differentiated and carefully marketed luxury coffee that targets a niche group, has high value-added, and has a high income elasticity of demand. The recent shift in consumption habits and preferences from ordinary to organic goods, which are usually higher up the value chain, poses an opportunity for countries that

specialize in agricultural production. Therefore, instead of moving from agriculture to manufacturing, developing countries could start producing niche high value-added products - within the agricultural sector - that allow them to take advantage of their comparative advantage (Kjöllerström and Dallto, 2008; Stevens and Kennan, 2006). Like horizontal structural change, this could also help developing countries make a structural shift towards higher value-added products. However, cases where developing countries have increased new agricultural product exports substantially enough to contribute to sustained growth of the local economy do not exist.

Another alternative to the conventional structural change, which entails moving production from agriculture to manufacturing, is skipping the manufacturing stage and moving from agriculture or other low value-added activities into high value-added service sector. For example, information technology (IT)-based services can be higher up the value chain than manufacturing. India is the best role model for successfully training its workforce and developing a strong IT-based service sector without first developing manufacturing. However, despite India's example, leaping straight into IT-based services can be more challenging for countries than first moving into the manufacturing sector. This is primarily due to the fact that most developing countries have very low-skilled human capital and IT-based services require very highly skilled labor. The limited resources do not often allow countries to invest in human capital development.

2.3 What Does History Tell Us: Empirical Evidence

It is important to look back at history and consider how countries have achieved structural change and what factors have hindered a structural shift in the past in order to understand how the current global dynamics can affect the prospect of sustained growth in developing countries. In order to discuss the connection between structural change and sustained growth, I will firstly examine domestic infant industry protection by considering the development path of NDCs, ISI policies, and the recent success stories of developing countries - a mix of orthodox and unorthodox development strategies. Secondly, I will assess the Washington Consensus - a set of policies focusing on free markets and minimum government intervention. I will provide empirical evidence to show that GDP growth of developing countries has generally (although not always) been higher during the episodes of state protection rather than free trade.

2.3.1 Domestic Infant Industry Protection

2.3.1.1 The development Path of NDCs

Looking back at the development process of NDCs and evaluating how they achieved structural change and strong economic performance could be a valuable lesson for developing countries. Chang (2003) states that developed countries emphasize the importance of "good policies" and "good institutions". "Good policies" refer to conservative macroeconomic policies, trade liberalization, investment, privatization, and deregulation; "good institutions"

imply democracy, "good" bureaucracy, an independent judiciary, strongly protected private property rights, transparent and market-oriented corporate governance, and transparent and market-oriented financial institutions. Although these "good policies and institutions" are nowadays recommended for the development process, looking back at the economic growth history of NDCs shows us that developed nations did not develop by following policies that were similar to the Washington Consensus. Instead, they rigorously protected domestic industries, and state intervention played an important role.

For example, from 1721 to 1846, Britain subsidized exports, protected its infant industries, decreased import tariffs on inputs used for exports, and strictly controlled the quality of exports. This allowed Britain to become a prosperous country. In 1846, it abandoned the Corn Laws and praised laissez-faire policies (Chang, 2003, 107). However, with the First World War, both the United States and Britain reintroduced tariffs to ensure that domestic industries were not threatened by foreign competition. And while NDCs developed the General Agreement on Tariffs and Trade (GATT), they remained very protective of domestic industries until the 1970s (Chang, 2003). While no country has ever developed successfully without taking advantage of the world market, no country has ever developed by simply opening itself up to free trade either (Rodrik, 2001). Most NDCs became free-market economies only after reaching a substantial level of development (Chang, 2003). "The trick" is to find the right sequence and

balance of engaging in trade activities with other countries and stimulating domestic entrepreneurship at the same time (Rodrik, 2001).

Chang (2003) argues that based on the current productivity gap between developed and developing countries, the protection levels in NDCs until the 1980s were higher than recent protectionism of developing economies. The author says this indicates that the strategies proposed for developing countries, such as open trade, are *results* rather than *causes* of economic advancement (Chang, 2003). Rodrik (2001) states that "integration with the world economy is an outcome, not a prerequisite, of a successful growth strategy" (page 22). Furthermore, Dowrick and Golley (2004) question the benefits of trade openness for small developing economies and argue that since 1980, mostly rich countries have accrued benefits from liberalized trade regime.

Therefore, open trade does not necessarily lead to economic advancement of developing countries. Rather, once countries become more and more developed, they are able to benefit from open trade. Chang (2003) claims that NDCs are "kicking away the ladder" rather than helping developing countries prosper when we consider the development strategies such as the Washington Consensus that emphasize trade openness and a laissez-faire approach.

2.3.1.2 Import-substituting Industrialization

The Prebisch-Singer hypothesis of 1950 provided a strong foundation for the ISI policies, which concentrated on protecting domestic industries. Under ISI,

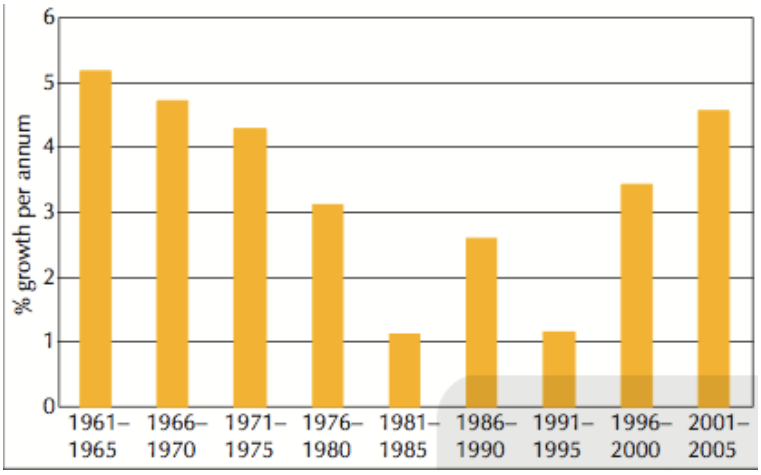
the government played a vital role in internalizing some of the high costs associated with risky ventures. They primarily used tariff and non-tariff barriers in order to protect infant industries that would give domestic firms learning opportunities and would allow them to enter high-productivity production and diversify the economy, allowing for structural change to occur. Tariffs were placed on imported goods so that the comparatively high-cost and / or low-quality domestic goods could compete in the local markets, while firms accumulated the necessary knowledge and technology to improve productivity levels and quality. For similar reasons, the state adopted non-tariff barriers such as subsidies and manipulated the currency. Tariffs were often preferred as they generated revenues for the government, which could then be reinvested back into the economy for further growth initiatives. Subsidies, on the other hand, added to government expenditures, and currency undervaluation made imports more expensive for the developing countries. During ISI, developing countries tried to produce similar products to those in NDCs. As Rodrik and Hausmann (2006) explain in *What You Export Matters*, "an economy is better off producing goods that richer countries export" (24) as it often leads to an improved economic performance.

Mainstream economists argued that ISI policies created distortions, rent seeking, and other market failures, which were mostly blamed on state intervention. Yet, Paus (2011) argues that in the Latin American case, ISI failed because of "overconfidence in the abilities of government as well as the lack of built-in performance requirements for protected industries" (page 71), rather than

the rationale underlying the policies. Similarly, Amsden (2001) highlights the importance of reciprocal control mechanisms, such as performance requirements, for ensuring that countries develop a comparative advantage in the new industry instead of becoming dependent on government support. She defines reciprocal control mechanisms as "a set of institutions that imposes discipline on economic behavior" (Amsden, 2001, 8). Thailand, for example, achieved impressive rates of growth with similar policies to Latin America and Africa by incorporating performance requirements into the development strategy. The state protection for infant industries needs to be slowly phased out as the firms gradually develop their own capabilities. This is what will allow countries to achieve sustained economic growth.

Africa implemented ISI policies in the 1960s - 1980s period, about a decade after most other regions such as Latin America. During the late 1960s and the early 1970s, African countries experienced substantial rates of GDP growth. In the 1970 - 1979 period, average GDP growth rate of the region was 4.2% (UNCTAD, 2001). ISI policies as well as a commodity price boom could explain the promising economic statistics of the early 1970s. However, as shown in Graph 2.1, in the late 1970s and the early 1980s, Sub Saharan Africa experienced an economic crisis - the GDP growth of the region went from 4.3 % per annum in the 1971 - 1975 period to 1.1 % in 1981-1985.

Graph 2.1
GDP Growth Rate for Sub Saharan Africa, 1961 – 2005



Source: UN, 2008

However, the decrease in GDP growth rates in the mid-1970s and in the 1980s cannot be attributed solely to the import substitution approach implemented in the region. One of the main causes of the downturn was the global economic crisis that was preceded by two oil crises. The crises affected the demand for African exports, which led to a decrease in commodity prices - Africa's primary exports. At the same time, despite the ISI policies, which entailed protectionism, countries failed to create a competitive manufacturing sector and thus did not achieve diversification and structural change (UN, 2008). The *Economic Development of Africa* report (2008) points to "excessive state intervention in the economy and mismanagement" to explain ISI failure (page 4).

The countries that were successful in achieving growth by protecting domestic infant industries had implemented import substitution with tailored

built-in control mechanisms. In Africa's case, poor governance within SSA, which lacked an effective implementation of ISI policies, such as reciprocal control mechanisms, and the global economic crises, were important factors that contributed to the decline in GDP growth. Therefore, overall, the rationale behind ISI policies should not be held accountable for the slowdown in GDP growth in Africa in the 1970s and 1980s.

On a larger scale, when we consider developing countries worldwide, the period between 1950 and 1970 experienced comparatively high rates of growth. This is the period when ISI policies were implemented in most countries. The growth rates were often (although, not always) associated with ISI (Bruton, 1998). Manufacturing as a portion of GDP went up during ISI; so, unlike Africa's case, ISI led to structural change in other countries.

2.3.1.3 How Developing Countries Have Achieved Substantial GDP Growth

The countries that have achieved impressive rates of sustained growth over the past three decades are not the ones that have strictly followed policies popularized by mainstream economists. They are countries that have used a mixture of conventional and unconventional policies. State intervention has consistently played an important role in facilitating the economic growth in countries such as China and the Asian Tigers. However, the governments also imposed strict control mechanisms to make sure that industries developed and became self-reliant with high levels of productivity and the ability to compete in

the world market without state protection. Performance requirements have also been imposed on foreign investors in these economies to ensure that knowledge and technology spillovers occur and contribute to the long-term growth goals of the domestic economies (Amsden, 2001). State protection with strict control mechanisms both for domestic and foreign firms is what has ensured the prosperity of the countries that adopted ISI policies. Those that lacked performance requirements were not successful in achieving their goal of developing domestic production in manufacturing.

The POSCO case in South Korea demonstrates that defying comparative advantage can lead to structural change and can be done successfully. The state-owned steel mill became the most profitable mill in Asia despite the fact that when POSCO opened in 1972, the per capita income in South Korea was only 5.5% of that of the US (Chang and Lin, 2009, 497). Although Lin claims that, at the time, steel industry had become a low-capital intensive industry, this argument seems far-fetched and unsupported. Chang points out that the steel mill ran high losses and was under state protection for a long period before it turned into a profitable venture. This clearly shows that countries can diversify production into non-traditional sectors higher up the value chain. This usually entails high initial investment as well as costs that can stretch over a long period of time, but this can be followed by exceptional payoffs.

Of course, we need to look at a country as a whole in order to see clear evidence that sustained growth can be achieved through structural change. China

is a good example of how a country can combine orthodox and unorthodox policies in order to achieve a structural shift within the economy. China maintained tight control on its development process through its Township and Village Enterprises (TVEs) and ensured that it developed domestic industries before opening up its borders. China did not achieve the double-digit growth rates over the past three decades as a result of trade liberalization. China also imposed demanding performance requirements on foreign firms to ensure knowledge and technological spillovers to local firms. China's cheap labor and its population of 1.3 billion people have played an important role in China's development allowing the country to protect its interests (Amsden, 2001). As investors want to take advantage of the cheap labor and the large market in China, they are willing to accept China's "rules".

It could be argued that China's story cannot be replicated in smaller nations, such as in SSA countries. In today's globalized world it is hard for economies to close their borders to protect infant industries and it is equally difficult to impose performance requirements on foreign investors. In fact, the increased importance and prosperity of China itself have increased the competitiveness of the global economic climate in which countries have to navigate. Although these aspects certainly pose strong challenges, as well as some opportunities, SSA countries that share similar interests could bypass the size issue by coordinating a regional plan, which will allow them to create a larger market.

2.3.2 The Washington Consensus

In the 1970s concerns emerged that ISI led to an inefficient allocation of resources, that employment was growing more slowly than expected, that poverty alleviation and inequality were not tackled efficiently, and that total factor productivity (TFP) was not increasing significantly (Bruton, 1998). This led to a shift in dominant economic thought. The markets were now perceived as the key to growth and development, and the government was labeled as a problem in itself, rather than a solution to a problem. Krueger (2008) points out that ISI promoted rent-seeking, as the government was given too much decision-making power instead of allowing free markets to allocate resources.

The new policy recommendations, known as the Washington Consensus, encouraged countries to open up their markets to foreign competition and capital flows, to privatize public firms because they were now considered inefficient, and to deregulate as most developing countries' governments were considered corrupt. Moreover, countries were advised to have stable macroeconomic policies - such as a controlled fiscal deficit, market-determined interest and exchange rates - to shift public spending from subsidies to investments in education, health, and infrastructure (Williamson, 1990). The Washington Census policies were widely adopted in developing economies. In Africa, for example, most countries had adopted the WC policies by mid-1990s (UN, 2008). But the Washington Consensus did not lead to the promised increased growth in developing economies.

In order to empirically analyze the effects of the Washington Consensus, Rodrik and McMillan (2011) break down productivity growth into two components - productivity growth "within" and "across" economic sectors - using the formula below.

$$\Delta Y_t = \sum_{i=n} \theta_{i,t-k} \Delta y_{i,t} + \sum_{i=n} y_{i,t} \Delta \theta_{i,t}$$

Y_t refers to economy-wide productivity levels and y_i refers to sectoral labor productivity. $\theta_{i,t}$ denotes the share of employment in sector i and the Δ signifies the change in productivity or employment shares between t-k and t. The first component, which is the "within" component, entails movement within the sectors "through capital accumulation, technological change, or reduction of misallocation across plants" (Rodrik and McMillan, 2011, 12) and the second - the "structural change" component, refers to a movement from low-productivity to high-productivity sectors. The study analyzes nine sectors and 38 countries including high-, middle-, and low-income economies.

Table 2.1
Decomposition of Productivity Growth,
Unweighted Averages, 1990 – 2005

	Labor Productivity Growth (LPG)	**Decomposition of LPG**	
Region		due to within sector LPG	due to structural change
Latin America and Caribbean	1.35%	**2.24%**	**- 0.88%**
Africa	0.86%	**2.13%**	**- 1.27%**
Asia	3.87%	3.31%	0.57%
High-income countries	1.46%	1.54%	- 0.09%

Source: Rodrik and McMillan (2011, 35)

As shown in Table 2.1, for Latin America and Africa the structural change component of productivity growth has been negative under Washington Consensus policies; in other words, labor has been moving from high-productivity to low-productivity production as a result of, for example, trade liberalization and currency overvaluation, making negative contributions to overall productivity growth. The negative structural change is strongest in African countries, which, the authors note, is especially disappointing with the backdrop of Africa's reforms since the 1980s. Asia has been experiencing productivity growth both "within" and "across" economic sectors. Thus, Africa's growth-reducing structural change cannot be attributed "solely to globalization and other external determinants" (Rodrik & McMillan, 2011, 17). *The Economic Development in Africa* report (2001) further states that the liberalization, deregulation, and privatization approach to economic activities proved to be unsuccessful in helping Africa

achieve sustained growth, even in countries that were "core- and good-adjusters" to the reforms (UNCTAD, 2001, 5).

Based on the WC policies, poor countries that have low-wage and also low-skilled labor and insufficient technologies could not compete in manufacturing and were "stuck" with producing what they knew how to produce - agricultural products and raw material extraction. As a result, often, they had to move back to the traditional lower-productivity areas and in some cases to the low-productivity service sector. The low labor costs sometimes still attracted FDI and transnational companies (TNCs) relocated their production to these developing economies in order to cut their costs. However, with no performance requirements imposed on foreign firms and low levels of knowledge and technology in the local economy, the spillover effects remained very low. The lack of emphasis on knowledge and technology accumulation or on the learning process throughout the WC period meant that long-term development remained an after-thought (Cimoli, Dosi, and Stiglitz, 2009).

Table 2.2 presents mean per annum growth rates of GDP per capita in three different time periods and shows that overall, mean yearly growth rates differed under ISI and WC.

Table 2.2
Mean Per Annum Growth Rates of GDP Per Capita

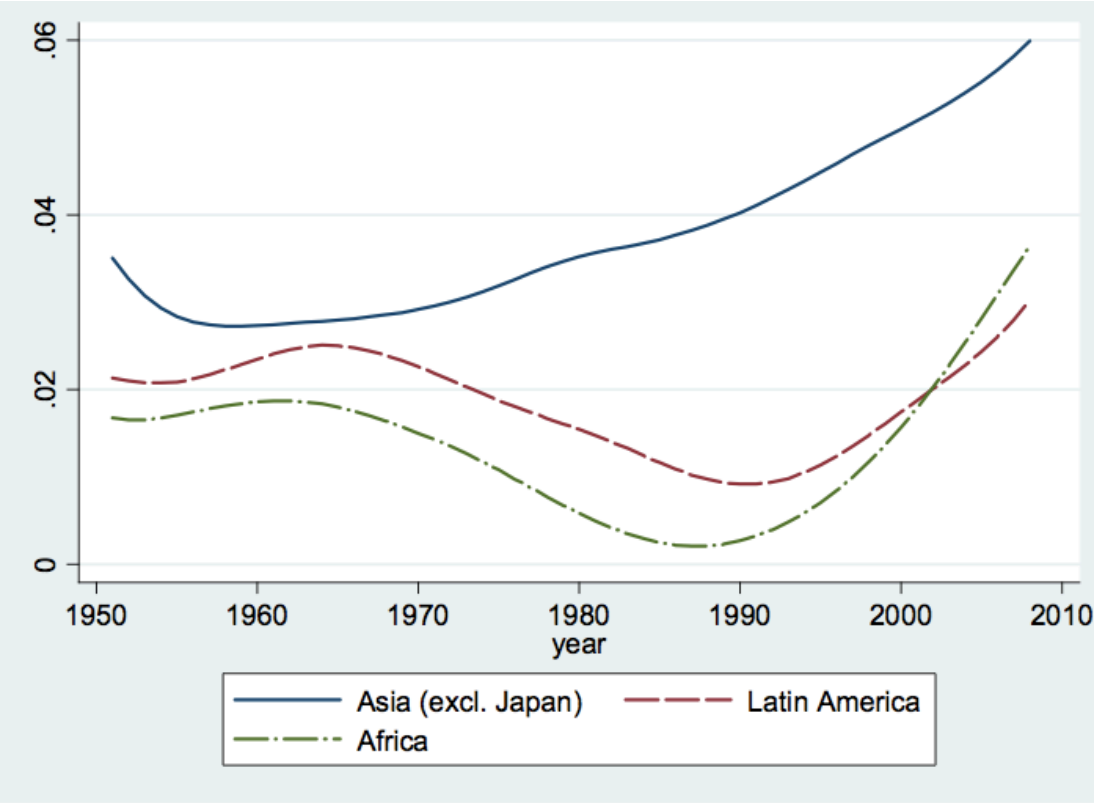
	1870 – 1960	**1960 – 1979**	**1980 - 1994**
Advanced capitalist countries (17)	1.5 (0.33)	3.2 (1.1)	1.5 (0.51)
Less developed countries (28)	1.2 (0.88)	2.5 (1.7)	0.34 (3.0)

Source: Sutcliffe (2004)

As we can see in Table 2.2, in less developed countries (LDCs), GDP per capita grew at the fastest rate - 2.5% - under ISI policies, whereas under the WC, the growth rate was as low as 0.34%. The growth rate also slowed down for advanced capitalist countries, but they still grew at 1.5% per annum even during the WC. Overall, we can see that developing countries' economies were harmed more dramatically under the WC policies and the GDP per capita growth rate was slowest in this episode.

Rodrik (2011) depicts GDP growth trends for Asia, Africa, and Latin America over a longer period of time - from 1950 to 2008.

Graph 2.2
Developing Country Growth Trend by Region, 1950 - 2008



Source: Rodrik (2011)

As we can see from the graph, Asia is an exception and has shown promising growth rates since the late 1950s. This can be explained by the economic success of the Asian Tigers and later, of China. Africa and Latin America, on the other hand, have had disappointing growth rates since the mid-1960s. Overall, Africa has lagged behind the two other developing regions, Asia and Latin America, but has started to show promising growth rates since 1990.

2.3.3 Influence on Mainstream Economists

The empirical evidence shows that developing countries generally benefited from ISI policies while they struggled under the Washington Consensus. Consequently, the importance of structural change and government involvement are reemerging among orthodox economists. For example, the Senior Vice President and Chief Economist of the World Bank, Justin Yifu Lin (2010), states that "the government should play an active, facilitating role in the industrial diversification and upgrading process and in the improvement of infrastructure" (page 3). Lin, unlike Rodrik (2006, 2011), Lin and Chang (2009), Chang (2003), and Bruton (1998), argues that countries should conform to their comparative advantage - the market should play the central role in allocating resources, while the states should facilitate the process rather than dominate it. However, as becomes evident in the Chang and Lin *Development Policy Review* debate (2009), Lin has a much broader definition of what certain countries' comparative advantages are. For example, he argues that Korea entering the steel industry conformed to its comparative advantage. Overall, the key point is that, the importance of structural change and of government intervention (or of "facilitation" as Lin labels it) is resurfacing among mainstream economists who play a key role in influencing global economic policies.

2.4 Concluding Remarks

Overall, as we can see, the western economies as well as China and the Asian Tigers have achieved sustained GDP growth by using a mixture of orthodox and unorthodox policies, which often included protectionism and performance requirements for both domestic and foreign firms. In most cases, their development strategy defied their comparative advantage, ensured structural change, and allowed these economies to prosper. By contrast, countries that conformed to their comparative advantage and followed liberalization, often faced deteriorating TOT among other challenges making sustained growth unattainable. At the same time it should be pointed out that countries sometimes faced economic downturns during protectionism and failed to achieve industrialization and sustained growth. However, the downturns were often explained by external factors or poor governance rather than by the rationale underlying the policies. Overall, empirical evidence suggests that structural change is strongly linked with sustained growth.

The sustained growth framework presented in this chapter provides the basis for analyzing China's effect on SSA's growth prospects. Growth-inducing structural change that often defies the developing countries' comparative advantage is considered as the main driver of sustained growth, thus it is important to identify ways in which China encourages or discourages the movement of labor and capital from low-productivity to high-productivity production higher up the value chain. Before turning the discussion to Sino-

African trade, in the next chapter I discuss SSA's economic development and the existing structure of the region's economy in order to provide a strong foundation for understanding China's existing and potential impacts on the prospect of sustained growth of SSA.

CHAPTER 3

SUB SAHARAN AFRICA'S ECONOMIC DEVELOPMENT AND STRUCTURE

Before I can explore how China affects Sub-Saharan Africa's prospects for structural change, it is important to give a brief overview of the region's economic development history and its economic structure in order to understand the state of the SSA economies before they extensively engaged in trade relations with the Global Giant. Although China and Africa have a long history of partnership, the dramatic increase in Sino-African interactions has occurred since China's economy opened up in 1978 and especially since China joined the WTO in 2001. I will discuss SSA's economic development in the 1990s leading up to the trade surge in the 2000s and the region's economic structure in 2000 in order to show the economic climate in which imports and exports increased dramatically.

Sub Saharan Africa is the poorest region of the world, and individual countries' growth rates have been insufficient to lift the population out of severe poverty. There are 47 countries in the region (see Appendix 2), with 26 economies classified as low-income ($1,005 or less), 14 as lower-middle-income ($1,006 to $3,975), 6 as upper-middle-income ($3,976 to $12,275), and 1 as high-

income ($12,276 or more) according to World Development Indicators (WDI) (see Appendix 3).[8]

3.1 Growth Trends During the 1990s

After becoming independent, most African countries implemented ISI policies in the 1960s. In the 1980s, like most other developing countries, the region started implementing the Washington Consensus policies. Over forty-five years, from 1961 to 2005, the region had the highest average GDP growth rate in the 1961-1965 period. Since then, SSA's GDP growth followed a downward trend with a recovery during 1986-1990 and then in the post-1996 periods (see Graph 2.1 in Chapter 2). Even with this recovery in GDP growth rates, only about a third of the countries in SSA had growth rates of 3% or above in the 1990-1999 period (author's calculation based on WDI data).

As shown in Table 3.1, 24 out of 45 countries, for which data were available, had growth rates of less than 3% over the 1990-1999 period. Out of the 24 countries, three countries had negative growth. Overall, only four countries had growth rates of more than 6%, and 13 countries enjoyed GDP growth rates between 3% and 6%.

[8] Some countries are omitted from the analysis throughout the rest of the paper due to lack of data. See individual tables for a specific list of omitted countries.

Table 3.1
GDP Growth Performance in Sub Saharan Africa, 1990-1999 Average
(Number of Countries in Each Growth Range)

Growth performance	1990-1999 (average)
Negative growth	3
Zero and positive growth	42
Low (0 per cent–2.9 per cent)	21
Medium (3 per cent–5.9 per cent)	17
High (more than 6 per cent)	4
Total number of countries	45

Source: Author's calculation based on WDI data, accessed on January 13, 2012.
Note: No data on Sao Tome and Principle and Somalia.

If we consider GDP per capita growth rates in the same period, the situation looks more severe due to the high population growth rates in individual countries. In this case, 22 countries had negative growth, and all the other countries had growth rates below 7%, with one exception - Equatorial Guinea (16.3 %). The average annual growth rate of GDP for the region in the 1990-1999 period was 3%, while GDP per capita growth average was only 0.6% (author's calculation based on WDI).[9] So, overall, most SSA countries experienced disappointing growth rates leading up to 2001.

[9] All average GDP values from WDI are weighted averages.

3.2 The Structure of Sub Saharan Africa's Economy

The disappointing growth rates can be partially explained by the structure of Africa's economy. Africa, as a region, has the least diversified economy of the world. Most African countries rely on agriculture and the service sectors and mining. Very few have substantially developed their manufacturing sectors. Table 3.2 gives a snapshot of the percentage contribution to GDP of agriculture, services, and industry. The industrial sector is decomposed into mining and construction and manufacturing.

Table 3.2
Agriculture, Service, Industry Value Added (% of GDP):
Number of SSA Countries in Each Bracket, 2000

Contribution to GDP (%)	Agriculture	Services, etc.	Mining and Construction	Manufacturing
0 % - 9.99 %	8	1	22	25
10 % - 14.99 %	4	1	7	11
15 % - 24.99 %	8	3	9	7
25 % - 49.99 %	20	24	2	1
Above 50 %	4	15	4	0
Total number of countries	44	44	44	44

Source: Author's calculation based on WDI data, accessed on January 13, 2012.
Note: No data on Guinea-Bissau, Sao Tome and Principle, and Somalia.

The table shows that while there are differences in the economic structure across countries, within the region, most African countries depend on agriculture and the service sectors, while high value-added production - manufacturing -

makes up less than 10% of GDP in more than half of the countries in the region. Construction and mining contributed less than 10% to GDP in half of the countries in the region, but it contributed more than 48% of GDP in five countries (Angola, Botswana, Republic of the Congo, Equatorial Guinea, Gabon). Only one country (Swaziland) had a prominent manufacturing sector in 2000.

Table 3.3
Agriculture, Service, Industry Value Added (% of GDP) for Low-income Countries (LICs), Middle-income Countries (MICs) and SSA, Weighted Values, 2000

Country group	Agriculture	Services, etc.	Mining and Construction	Manufacturing	Total
Low income	33.9%	45.2%	9.3%	11.5%	100%
Middle Income	11.4%	53.1%	14.0%	21.5%	100%
Sub-Saharan Africa	16.3%	54.3%	14.5%	14.9%	100%

Source: WDI data, accessed on February 17th, 2012.

When comparing Sub-Saharan Africa's economic structure to that of low- and middle-income countries, the most important observation is that its mining and construction and service sectors are very similar to those of middle-income countries (see Table 3.3). The primary difference between the SSA region and MICs lies in the relative importance of agriculture and manufacturing value added (MVA): MVA as a percentage of GDP was 14.9% in SSA countries - 6.5 percentage points lower than in middle-income countries and agricultural value

added was 16.3% of GDP - almost 5% higher than the value for middle-income economies.

Within manufacturing, SSA primarily depends on RBM. According to UNCTAD (2011), RBM represented 51.6% of total MVA in the year 2000. Low-technology manufacturing (LTM) was 22.9%, while medium-technology manufacturing (MTM) and high-technology manufacturing (HTM) together represented 25.5% of total MVA (See Table 3.4). The UNCTAD study also includes North Africa. Excluding this sub-region and South Africa is likely to change this picture towards an even higher concentration in RBM and in LTM.

Table 3.4
African Manufacturing by Sector and Technological Classification, 2000 (%)

ISIC rev. 3 manufacturing sectors	African MVA structure Share of total MVA	African share in the world Share in world MVA
15 - Food and beverages	20.0	2.4
16 - Tobacco	3.0	3.4
20 - Wood	2.8	1.7
21 - Paper	3.1	1.3
23 - Refined petroleum and coke	5.9	2.0
25 - Rubber and plastics	2.7	1.0
26 - Glass and other non metallic minerals	6.8	2.2
27 - Basic metals	7.3	1.7
Subtotal RBM	**51.6**	**2.0**
17 - Textiles	6.8	3.1
18 - Apparel	4.7	3.0
19 - Leather	1.5	2.7
22 - Publishing and printing	2.9	0.8
28 - Fabricated metal products	5.2	1.1
36 - Furniture and manufacturing n.e.c.	1.8	0.7
Subtotal LTM	**22.9**	**1.5**
24 - Chemicals	12.4	1.6
29 - Machinery and equipment	3.7	0.6
30 - Office machinery	0.3	0.1
31 - Electrical machinery	2.0	0.6
32 - Radio, TV and communication equipment	0.9	0.1
33 - Medical, precision and optical instruments	0.3	0.1
34 - Motor vehicles	4.9	0.9
35 - Other transport equipment	1.0	0.5
Subtotal MTM and HTM	**25.5**	**0.6**
TOTAL Manufacturing	**100.0**	**1.2**

Source: UNCTAD (2011), Table 2.

3.3 Conclusion

Overall, it is evident that in the year 2000, most Sub Saharan African economies were not very diversified, and most countries relied primarily on agriculture and service sectors. At the same time, the manufacturing sector represented less than 10% of GDP in most countries of the region, while mining accounted for a substantial weight in industrial value added. The next section will explore the interaction channels in the China-Africa context that can fundamentally affect Sub Saharan African economies.

CHAPTER 4

CHINA-AFRICA INTERACTIONS: CHANNELS OF IMPACT ON STRUCTURAL CHANGE

The sustained growth framework presented in Chapter 2 discusses the importance of growth-inducing structural change, which entails the movement of labor and capital from low-productivity to high-productivity activities. In today's globalized world, interaction with other countries has become an important part of every economy. Consequently, these interactions are increasingly influential in determining the flow of capital and labor from low-productivity to high-productivity production or vice versa; thus, they affect structural shifts that occur in the domestic economy. As China's relations with Sub Saharan Africa intensify, the Global Giant is becoming an important player in the economic activities of all countries in the region, thus affecting growth-inducing or growth-reducing structural change within individual countries.

4.1 Primary Channels of Interaction

Kaplinsky and Messner (2007) identify six primary channels through which China's impacts may be transmitted. These channels are trade, FDI, aid, global governance, migration, and environment. The authors group the impact channels into *complementary* and *competitive* as well as *direct* and *indirect* categories. Effects are *complementary* when "both countries gain from it"

(Kaplinsky et al., 2008, 2). *Competitive* effects, on the other hand, are those that pose challenges for "developing countries' exports and domestic production" (Shafaeddin, 2004, 112).

The differentiation between *complementary* and *competitive* impacts is essential. For example, increased Chinese FDI in the region can have positive spillovers on the domestic economies through technology and knowledge transfers generating a *complementary* effect. However, it can also displace local producers, as they may be unable to compete with Chinese producers, which would generate a *competitive* effect.

The *competitive* and *complementary* effects can be classified as *direct* or *indirect*. *Direct* impacts arise when countries directly interact with one another through one of the channels. *Indirect* impacts are those that result from China's relations with third countries, but they can still substantially affect SSA. In terms of *competitive* impacts, displacing local producers is a *direct* effect that Chinese FDI could have on SSA. At the same time, as China's importance rises and SSA has to compete with China for global FDI and production platforms, potential FDI may be diverted from SSA towards China - an *indirect* effect (Kaplinsky et al. 2010). Figure 4.1 sums up Kaplinsky's typology.

Figure 4.1
A Synthetic Framework for Assessing the Impact of China on SSA

Channel	Impacts			
	Complementary		Competitive	
	Direct	Indirect	Direct	Indirect
Trade				
Investment				
Aid				
Global Governance				
Migrants				
Environment				

Source: Kaplinsky (2008)

4.1.1 The Significance of the Impact Channels in the China-SSA Context

When China's economy opened up in 1978, its overall interaction with Sub Saharan Africa increased significantly through each of the impact channels listed in the framework. Trade experienced a particularly dramatic surge after China's accession to the WTO in 2001 as China has turned to SSA's resources to support its unprecedented growth. At the same time, SSA has increased its imports of cheap Chinese goods (Schiere et al., 2011). The trade value increased from $10 billion in 2002 to $209 billion in 2008 (Kaplinsky et al., 2010). According to the Chinese Ministry of Commerce, China's FDI in Africa has increased by 46% per year over the last ten years, reaching $4.46 billion in 2007 (Schiere et al., 2011, 35). Additionally, China has provided about $1.5 - 2 billion a year in aid for African countries (Schiere et al., 2011, 20). Chinese migration to Africa has also increased significantly. The increased relations affect the local environment in African countries, especially due to the fact that China's primary

interest lies in the exploitation of natural resources. Moreover, the large global actor influences the governance within individual African countries and the policies implemented across the region.

4.1.2 Focus on Trade

As briefly described in the previous section, each of the six channels is essential in understanding how China affects the economies of individual countries in the region. However, I will focus my analysis on trade due to its significant rise over the past decade and its importance for the region. Moreover, data on trade, although not always reliable, are widely available, which allows economists to carry out empirical studies and make conclusions based on measurable evidence. I will adapt Kaplinsky's framework (see Figure 4.1) to the analysis of trade impacts, and I will extend it to explore how China's trade with the region can lead to growth-inducing or growth-reducing structural change in SSA.

4.2 Trade

Trade can create opportunities as well as challenges for structural change of a country. As highlighted in Kaplinsky's typology, *complementary* and *competitive* effects can arise through *direct* interactions between China and the region as well as indirectly, through China's engagement with other countries.

4.2.1 Complementary Effects

4.2.1.1 Direct Complementary Effects

There can be *direct complementary* effects on the domestic producers in SSA both on the import side and on the export side. A rise in imports from China can be a valuable source of cheap and high-quality intermediate goods, which can help domestic producers by increasing access to cheap inputs. If the goods entail more advanced technologies, then increased inputs from China can facilitate faster technological progress of domestic firms through spillover effects and reverse engineering. This could contribute to increased productivity and raise the potential for capital accumulation in higher value-added activities. Increased imports can also positively affect consumer welfare, as cheaper consumer products become widely available in the domestic economy.

A rise in Chinese demand can lead to a rise in global prices, which can benefit exporters of these goods to China. Moreover, African producers have an opportunity to export to a huge market of 1.3 billion people, so they can increase the volume of goods they are producing and exporting. The export surge could also benefit non-exporters as they learn from exporters through the demonstration effect. Additionally, the foreign exchange generated from increased exports allows countries to import more capital goods. Levine and Renelt (1992) find that increased exports contribute to growth primarily through increased imports of capital goods that lead to higher investment.

4.2.1.2 Indirect Complementary Effects

Indirect complementary effects entail impacts that are similar to those described in the *direct complementary* section with the primary difference being that the effects do not occur through *direct* interaction with China, but indirectly - in third markets. For example, rising global prices could benefit producers of these products that export to third markets rather than to China.

4.2.1.3 The Link Between Complementary Effects and Structural Change

Whether or not *complementary effects* translate into growth-inducing structural change will depend on the long-term effects on domestic production and on which sectors are affected. A *complementary effect*, as defined by Kaplinsky's framework, does not always lead to broad-based structural change from low-productivity to high-productivity production. For example, even though producers may increase exports due to a rise in Chinese demand for goods, this may not contribute to growth-inducing structural change per se; if the exports are concentrated in raw materials, it may even lead to growth-reducing structural change. On the other hand, Sub Saharan African countries have the potential to increase their productivity through spillover effects from trade with China. Also, cheap imports and increased foreign exchange earnings can allow SSA to import and accumulate capital goods for higher value-added activities, which can contribute to growth-inducing structural change.

The allocation of rents is an important factor when analyzing the impact of *complementary effects* on structural change. If governments can capture part of the windfall profits, the rents from raw material exports can be a valuable resource for structural change. The government may choose to invest the resources in areas that support the development of higher value-added activities and stimulate sustained growth of the economy through growth-inducing structural change. Such areas of investment may be education and infrastructure among others. Furthermore, rents can be reinvested in productive sectors of the economy or can be used to support infant industries to allow them to become competitive, thus contributing to structural change. However, rents may be captured by a small number of producers or by a corrupt government. Therefore, even if rents are generated through exports, this may not lead to an effective reinvestment of the funds.

4.2.2 Direct and Indirect Competitive effects

On the other hand, there may be *competitive* impacts through increased trade between two countries. A *direct competitive* impact could be a result of cheap imports that lead to the movement of labor and capital to less productive and informal sectors. Cheap imports can crowd out certain domestic producers altogether leading to a loss of jobs without providing an alternative.

Increasing Chinese imports in third markets can also crowd out African producers due to increased competition between Chinese and African goods in

these markets. These effects would be classified as *indirect competitive* effects. China also influences global prices. When Chinese demand and supply affect the prices of goods that are imported and exported by SSA, this consequently influences the African economies. Due to the sheer size of its economy, low wages, and extensive production capabilities, China can cause a decrease in prices in the global market for the products that it produces. This could harm SSA exporters of similar products who have to decrease either the price or the quantity of their exports to China or to third markets. However, being exposed to increased competition can motivate domestic firms to increase their productivity. This could help producers become more efficient and competitive internationally. Increased competition could also stimulate innovation, and producers may find new niche markets where they can produce non-traditional goods that have high value-added; or, producers may reallocate resources to the activities in traditional sectors where a country's comparative advantage lies (Dowrick and Golley, 2004).

Most Sub Saharan African countries are competitive in PP and RBM rather than in manufactured goods. Therefore, increased trade with China may put increasing pressure on countries to move production to activities where their comparative advantage lies. If, as a result of *competitive effects,* producers have to move from manufacturing to the traditional agricultural sector, this will decrease overall productivity and the value added. While this sector absorbs a lot of labor, it is generally less productive than manufacturing. Producers may move from

manufacturing into raw material extraction, which is highly productive but absorbs only a limited number of jobs and it could even lead to a loss of jobs; thus, the movement of production from manufacturing into raw material extraction does not generate broad-based structural change. Furthermore, exporting raw materials has few backward and forward linkages with the local the economy and low spillover effects. So, this could lead to growth-reducing structural change.

Even though an increase in exports and in global prices for African exports was discussed as a *complementary effect* in the previous section, it could have negative effects in the long-run depending on which goods are exported on a larger scale. More specifically, if a country is exporting more raw materials and if the prices for these commodities are on the rise, increased foreign exchange inflows can lead to currency overvaluation leading to the Dutch Disease. This can often become a significant barrier to moving production to high value-added activities. So, while increased raw material exports can be a valuable source for rents, the strong currency can further harm the manufacturing sector as these goods become too expensive to export. Increased competitiveness could also limit the possibility of entering high value-added markets in the future (Kaplinsky and Morris, 2007). Therefore, the *competitive* effects could lead to a process of "deindustrialization" resulting in growth-reducing structural change.

4.3 Conclusions

In summary, trade can have mixed effects on structural change in countries. The effects depend on the sector and its competitiveness. So, while trade may provide benefits for the local economy through increased imports and exports, it may also pose challenges for domestic producers. Trade can allow access to a greater variety of cheaper and high-quality intermediate goods, which can help domestic industries become more competitive and productive. Countries may export more goods, generating rents and reinvesting into activities that will contribute to the development of higher value-added activities. On the other hand, domestic producers may be unable to compete with cheaper Chinese goods, both domestically and in third markets. Manufactured goods may face a double burden if they are not competitive in external markets while being displaced locally by cheaper imported goods leading to growth-reducing structural change.

Overall, some effects may be *complementary* in the short term, but they may not contribute to a structural shift towards higher value-added production in the long run. Some effects are *competitive* for the domestic economy, both in the short run and in the long run. These effects may also lead to a movement of labor and capital from higher to lower value-added production. These effects are summarized in Figure 4.2.

Figure 4.2
A Synthetic Framework for Assessing the Impact of China on SSA through the Trade Channel, Including Structural Change

	Direct	Indirect	Structural Change
COMPLEMENTARY	1. Cheap and high-quality intermediate and capital good imports from China	China's influence on global prices -cheaper intermediate and capital good imports from third markets	Depends on which goods are imported and whether the cheap products negatively affect domestic producers OR whether they contribute to capital accumulation in higher value-added activities and technological progress, which can help improve productivity
	2. Cheap and high-quality consumer good imports from China	China's influence on global prices -cheaper consumer good imports from third markets	Depends on which goods are imported and whether the cheap products negatively affect domestic producers
	3. Increase in prices and volume of exports to China	Increase in prices and volume of exports to the rest of the world	Depends on which export prices or quantities are going up. If raw materials, this can generate increased rents, which could be invested in developing production capabilities higher up the value chain. If manufactured goods or non-traditional high value-added goods, this can lead to structural change. Also, an increase in export prices and volumes can generate more foreign exchange, which can be used to import capital goods; this can also assist structural change. However, the increased price effect would be negative for the SSA countries that are importing these goods.

Figure 4.2
A Synthetic Framework for Assessing the Impact of China on SSA through the Trade Channel, Including Structural Change (Continued)

COMPETITIVE	1. Increased competition domestically due to imports from China	Increased competition in third markets due to Chinese exports	Depends on which producers are affected and how they are affected. Capital and labor may move to less productive or informal sectors, or producers may be driven out of business altogether. But, a more competitive environment could motivate producers to increase productivity and/or find higher value-added niche markets in non-traditional sectors that do not face Chinese competition. Also, resources may be reallocated to where comparative advantage lies - outcomes depend on whether this is higher or lower in the value chain. Increased competition can also put up barriers for entering potential markets.
	2. Decrease in prices and volume of exports to China	Decrease in prices and volume of exports to the rest of the world	Depends on which exporters are affected (high or low value-added).

The most striking observation from Figure 4.2 is that even when China's impacts on SSA are classified as *complementary*, these effects do not automatically lead to growth-inducing structural change. The outcome will depend on which products and sectors are affected and how they are affected.

In the next chapter, I employ Kaplinsky's framework to analyze the effects of Sino-African trade on SSA economies while focusing on the technological composition of imports and exports and how it has evolved over the past decade. Throughout the chapter, I pay particular attention to the link between these effects and the prospect of structural change in the region by extending Kaplinsky's framework. Due to the availability of data and secondary sources, I primarily focus on *direct complementary* and *competitive* effects but I also briefly analyze the *indirect* effects.

CHAPTER 5

CHINA'S TRADE WITH SUB SAHARAN AFRICA

While the literature on trade between China and SSA encompasses general trends as well as empirical studies that measure China's effects on SSA through this impact channel, there is a gap in the literature in looking at the technological composition of the Sino-African trade. Several studies highlight that SSA mostly exports natural resources to China and imports manufactured goods, but they do not provide a comprehensive overview of the trade structure over time. Furthermore, most studies discuss the effects on GDP growth of SSA economies, but they do not extend the analysis to the long-term growth prospects and structural change in the region. As discussed in Chapter 4, some *complementary* effects can be beneficial in the short run, but do not lead to structural change, hence to sustained growth.[10]

Kaplinsky's synthetic framework presented in Chapter 4 provides an overview of the ways in which China could impact Sub Saharan African economies. This framework is identified as a useful tool in many studies in the literature (Ancharaz, 2009; Subramanian and Matthijs, 2007; Jenkins and Edwards, 2006). My contribution to the existing literature lies in extending Kaplinsky's framework to encompass structural change, which allows me to

[10] As stated in Chapter 1, "structural change" refers to growth-inducing structural change unless otherwise stated.

investigate the long-term effects that China has on SSA economies through the trade channel rather than only considering the short-term effects. I also add to the literature by analyzing the technological structure of trade while discussing *complementary* and *competitive* effects and the consequences for structural change. Incorporating the trade structure into the analysis is important in assessing how China affects the region's exports, domestic production, and the prospect of structural change.

This chapter aims to evaluate whether the post-2001 increase in overall trade volumes has opened up an opportunity for SSA countries to advance the structure of domestic production and increase exports of high value-added goods. Or do primary products and resource-based manufactures still account for a large portion of SSA's exports to China, while high value-added manufactures make up most of the imports from China into the region?

In order to answer these challenging questions and to structure the rest of the discussion, I use the extended synthetic framework for assessing the impact of China on SSA through the trade channel (Figure 4.2). My analysis of the technological structure of imports from China shows that SSA's imports from China have stayed concentrated in technology-intensive products with a slight shift from low-technology products to goods higher up the technology ladder in recent years. At the same time, imports from China represent a significant share of world imports in almost every Sub Saharan African country.

On the export side, I focus on two specific country groups in order to explore how the structure of SSA's exports to China has evolved over the past decade. The two groups differ significantly in their export structure in order to account for some of the diversity within the region. I selected the first country group based on the countries' natural resource exports to China either in 2000 or 2010. These countries account for a bulk of the region's exports to China and my findings show that as trade with China has increased, this group of countries has increasingly relied on mineral fuels as their primary exports to China.

I chose the second country group based on strong manufacturing exports to the world in 2000 as these countries would have been most likely to take advantage of the huge Chinese market of 1.3 billion people as a destination for their manufactured exports. I found that the countries that had a relatively strong manufacturing sector in 2000 have not substantially increased their manufactured exports to China over the past decade; at the same time, most countries have decreased their manufactured exports to the world as a proportion of total exports.

While there are significant differences from country to country, my overall findings show that most of SSA's exports to China have not moved up the technology ladder over the past decade and they have stayed highly concentrated in primary products such as mineral fuels.

In this chapter, I elaborate on how the structure of trade has evolved over the past decade and I discuss the *direct* effects that China has on SSA through

trade. I also explore the *indirect* effects while identifying both *complementary* and *competitive* effects.

5.1 Data and Sources

I gathered the data on the technological structure of direct trade between China and individual Sub Saharan African countries from UN Comtrade. I used Lall's (2000) technological classification of exports (Standard and International Trade Classification (SITC) 3-digit, revision 2) to group traded products into five main categories: primary products, resource-based, low-technology, medium-technology, and high-technology manufactures (see Appendix 1 for a detailed description of what constitutes the individual commodity groups). In addition to using Lall's technological classification, I also incorporate SITC 1-digit, revision 2 data into the discussion. The data are presented for the years 2000 and 2010 to show how the Sino-African trade structure has evolved over the past decade.

Due to lack of data availability on exports to China for some countries and to ensure greater data cohesion, I used imports from SSA countries reported by China as a proxy for SSA's exports, and I used exports to SSA reported by China as a proxy for the African countries' imports from China. There can be a considerable discrepancy between the figure that country A reports as its exports to country B and the figure that country B reports as its imports from country A. Some discrepancy is expected due to transaction costs, but the difference between the figures is usually much higher than can be explained by transaction costs.

Using China's imports from SSA as a proxy for SSA's exports to China and vice versa is a good solution as it allows me to extend the analysis to all Sub Saharan African countries rather than limiting my research to the countries, which report their import and export data.

5.2 Direct Complementary and Competitive Effects

5.2.1 Overall Sino-African Trade Increase

Since China's accession to the WTO in 2001, trade between China and Africa has increased significantly. Sino-African trade increased by an average rate of 35% per year between 2000 and 2008 (Ye, 2011). The United States and Europe still remain the region's largest trading partners, but China has now become the third largest trading partner for SSA (Ademola et al., 2009). According to UN Comtrade data, total trade between China and SSA went from $8.3 billion in 2000 to $99.42 billion in 2010, an almost twelve-fold increase (author's calculation based on UN Comtrade).

Table 5.2
SSA's Imports from and Exports to China and the World

	Trade Partner	2000	2010
Imports from	**China**	3,532,701,418	43,673,311,740
	World	67,738,032,595	251,490,751,680
	%China	**5.22**	**17.37**
Exports to	**China**	4,775,557,874	55,746,111,476
	World	94,661,429,954	311,017,749,984
	%China	**5.04**	**17.92**

Source: Author's calculation based on UN Comtrade (accessed on April 4, 2012)[11]

As shown in Table 5.2, China accounted for 5% of SSA's imports in 2000 and 17% in 2010. On the export side, SSA exported 5% of its goods to China in 2000, but in 2010 China accounted for almost 18% of SSA's exports. It is evident that China's significance in SSA's exports and imports increased substantially and that China has been one of the primary drivers of the overall increase in SSA's import and export values.

5.2.2 Aggregate Trade Structure

The overall trade structure between China and SSA follows the comparative advantage theory: China mostly exports manufactured goods to SSA while SSA exports low value-added goods, mostly raw materials, to China. Table 5.3 shows the aggregate data for exports and imports between SSA and China and the world indicating the percentage share of China in each category of Lall's technological classification as well as in total trade.

Overall, both the absolute values and China's share in the imports and exports in each classification have increased significantly over the last ten years. China's importance in total exports and imports has also gone up significantly, with LTM dominating imports from China and PP and RBM dominating African exports to China in 2010.

[11] These numbers were obtained by adding up trade values of the five commodity groups as classified by Lall (2000).

Table 5.3
Exports and Imports by Commodity Group for all SSA Countries (Lall's Classification, SITC 3-digit, Revision 2)

		SSA Imports from		SSA Exports to	
Commodity Group	**Partner**	**2000**	**2010**	**2000**	**2010**
Primary Products	China	300,398,754	1,135,362,769	3,878,265,486	42,591,713,645
	World	7,869,041,774	28,814,659,991	59,555,557,623	221,977,056,107
	% China	**3.82**	**3.94**	**6.51**	**19.19**
Resource-Based Manufactures	China	272,375,337	4,580,144,897	735,980,294	11,144,364,505
	World	12,887,817,458	59,491,702,621	19,048,723,214	51,425,817,335
	% China	**2.11**	**7.70**	**3.86**	**21.67**
Low-Technology Manufactures	China	1,414,375,390	14,801,091,170	42,639,123	190,059,003
	World	9,955,784,631	37,316,052,469	6,067,804,164	8,844,205,524
	% China	**14.21**	**39.66**	**0.70**	**2.15**
Medium-Technology Manufactures	China	1,112,854,004	16,303,779,969	113,896,363	1,468,751,242
	World	26,259,228,899	93,475,338,078	8,516,490,516	24,692,139,686
	% China	**4.24**	**17.44**	**1.34**	**5.95**
High-Technology Manufactures	China	432,697,933	6,852,932,935	4,776,608	351,223,081
	World	10,766,159,833	32,392,998,521	1,472,854,437	4,078,531,332
	% China	**4.02**	**21.16**	**0.32**	**8.61**
Total[1]	China	3,532,701,418	43,673,311,740	4,775,557,874	55,746,111,476
	World	67,738,032,595	251,490,751,680	94,661,429,954	311,017,749,984
	% China	**5.22**	**17.37**	**5.04**	**17.92**

Source: Author's calculation based on UN Comtrade

[1] These numbers were obtained by adding up trade values of the five commodity groups.

5.2.3 Imports

5.2.3.1 Product Concentration

SSA countries mostly import manufactured goods from China. Manufactured goods classified by material (Group 6 as defined by SITC 1-digit) were top imports from China for 22 countries in 2000 and 20 countries in 2010. Machinery and transport equipment (Group 7 as defined by SITC 1-digit) were top imports from China for 13 countries in 2000 and 25 countries in 2010 (see Table 5.4). So, overall, manufactured goods were top imports from China in almost every SSA country both in 2000 and 2010.

Table 5.4
Number of Countries for which the Specified Commodity Category is the Top Import from China and the World

SITC 1-Digit Commodity Codes and Descriptions	2000		2010	
	China	World	China	World
0. Food and live animals	3	3	0	2
1. Beverages and tobacco	0	0	0	0
2. Crude materials, inedible, except fuels	1	0	0	0
3. Mineral fuels, lubricants and related materials	0	3	1	4
4. Animal and vegetable oils, fats and waxes	0	0	0	0
5. Chemicals and related products, n.e.s.	1	0	0	0
6. Manufactured goods classified chiefly by material	**22**	**6**	**20**	**8**
7. Machinery and transport equipment	**13**	**34**	**25**	**33**
8. Miscellaneous manufactured articles	7	1	1	0
9. Commodities and transactions not classified elsewhere in the SITC	0	0	0	0
No Data	0	0	0	0

Source: Author's calculation based on UN Comtrade

5.2.3.2 Technological Structure

Most imports from China are concentrated in low-technology and medium-technology manufactures (see Table 5.5). Unlike SSA's exports to China, only a small percentage of Chinese imports are concentrated in PP and RBM. In 2000, 16% of total imports were in these two categories, while it was only 13% in 2010. Low-technology manufactures, on the other hand, accounted for a significant share of imports from China. Medium-technology manufactures made up more than a third of imports from China in 2010, while high-technology manufactures accounted for almost 16% of total imports from China.

Table 5.5
Technology Composition of SSA's Imports from China
(Lall's Classification, SITC 3-digit, Revision 2)

	Imports from China	
Commodity Group (% of total)	**2000**	**2010**
Primary Products	8.50	2.60
Resource-Based Manufactures	7.71	10.49
Low-Technology Manufactures	**40.04**	**33.89**
Medium-Technology Manufactures	**31.50**	**37.33**
High-Technology Manufactures	12.25	15.69
Total %	100	100

Source: Author's calculation based on UN Comtrade

As discussed in Chapter 4, an increase in cheap imports can have *complementary* effects on domestic economies because it can be a valuable source of intermediate and capital goods as well as consumer goods. However,

competitive effects may also arise as some Chinese imports might compete with domestic producers.

5.2.3.3 Complementary Effects

Some studies have shown that a rise in imports from China has a positive impact on SSA economies. Baliamoune-Lutz (2011) carries out an empirical study according to which the share of imports from China in a country's total imports has a robust positive effect on growth. The author highlights that this effect partly works through investment as imports from China are positively correlated with the investment ratio. Ademola et al. (2009) also highlight the importance of the availability of lower-priced intermediate and final goods for the Sub Saharan African countries. Maswana (2009) points out that capital-intensive imports are important as they can be the drivers of technology transfer. Evidence shows that "countries that import capital goods and export consumer goods grow faster than those that export capital goods" (Lewer and Van Den Berg, 2003 as cited in Baliamoune-Lutz and Ndikumana, 2007, 5). Therefore, the increase in imports of capital and consumer goods can have some positive effects for the local economies. However, these imports can also compete with domestic production and crowd out African producers.

5.2.3.4 Competitive Effects

As identified in the synthetic framework in Chapter 4 (Figure 4.2), capital good imports can be a valuable source of technological progress, as countries can accumulate capital and advance their technological skills through imitation and reverse engineering. Maswana (2009) finds that not the act of trading itself, but the transfer of technological know-how through trade is what increases economic growth. However, empirical studies do not find causality between increasing trade with China and productivity-enhancing technology transfers (Elu and Price, 2010). Elu and Price (2010) carried out an econometric study to measure whether China transfers productivity enhancing technology to SSA. They used micro-level data on manufacturing firms in Kenya, Ghana, Nigeria, South Africa, and Tanzania (1992 - 2004), which they believe is a good representation of the manufacturing firms in the SSA region overall. In addition to the missing link between trade openness with China and technological transfer, the authors find that in some cases increased trade openness with China led to lower TFP for SSA. They highlight that the negative and significant coefficient on trade openness with China shows that higher trade flows between China and the region displaces SSA manufacturers causing a decrease in firm TFP.

5.2.4 Exports

5.2.4.1 Product and Country Concentration

SSA's exports to China are highly concentrated in raw materials. Table 5.6 shows, which goods are top exports for the SSA countries. The numbers in the columns indicate the number of countries for which the commodity is the top export.

According to Table 5.6, inedible crude materials with the exception of oil (Group 2 as defined by SITC 1-digit) were one of the top exports to China for 20 countries in 2000 and for 26 countries in 2010. Mineral fuels, lubricants and related materials (Group 3 as defined by SITC 1-digit) were top exports for only 6 countries, both in 2000 (Angola, Congo, Rep., Equatorial Guinea, Nigeria, Sudan, and Cameroon), and in 2010 (Angola, Congo, Rep., Equatorial Guinea, Nigeria, Sudan, and Chad). However, the exports in this category accounted for 65% of total SSA exports to China in 2000 and 56% in 2010 (author's calculation based on UN Comtrade data). This shows that a large proportion of exports to China were concentrated in a small number of countries in 2000 and in 2010. Although the percentage share of mineral fuels, lubricants and related materials in total exports has decreased, the value of exports in this category increased from $5 billion to $60 billion. At the same time, SSA's exports to the world were more diversified than its exports to China both in 2000 and 2010.

Table 5.6
Number of Countries for Which the Specified Commodities are Top Exports (SITC 1-digit)

	2000		2010	
Name	**China**	**World**	**China**	**World**
0. Food and live animals	5	19	1	16
1. Beverages and tobacco	1	2	2	1
2. Crude materials, inedible, except fuels	**20**	7	**26**	**5**
3. Mineral fuels, lubricants and related materials	**6**	**8**	**6**	**9**
4. Animal and vegetable oils, fats and waxes	0	0	1	1
5. Chemicals and related products, n.e.s.	2	0	4	2
6. Manufactured goods classified chiefly by material	3	7	5	8
7. Machinery and transport equipment	2	2	2	1
8. Miscellaneous manufactured articles	0	2	0	3
9. Commodities and transactions not classified elsewhere in the SITC	1	0	0	1
No Data	7	0	0	0

Source: Author's calculation based on UN Comtrade

According to Ye (2011) petroleum is by far the most important export to China from Africa accounting for 71% of total exports to China over the 2006-2008 period.[12] Ores and minerals represented 16% of exports to China over the same period, while manufacturing products made up only 4%. Compared to the average exports in the 1992-1994 period, China's imports from Africa have become heavily concentrated in the top two commodity groups - petroleum and ores and metals. While the absolute value of manufactured exports has gone up, the share of these goods in total exports to China has decreased from 9% (1992-1994 average) to 4% (2006-2008 average) (Ye, 2011).

Overall, exports to China have been concentrated in crude materials and mineral fuels for most of the Sub Saharan African countries while a small number of countries have accounted for a majority of exports to China.

5.2.4.2 Technological Structure

Most of SSA's exports to China are concentrated in PP and RBM (see Table 5.7). PP and RBM together accounted for 96.6% of total exports to China in 2000 and 96.4% in 2010. Manufactured goods, on the other hand, accounted for less than 0.5% of total exports to China, both in 2000 and 2010. While the absolute value of low-technology manufactures increased between 2000 and

[12] Ye (2011) discusses all African countries, but the patterns for the Sub Saharan African subregion are generally similar to the ones presented in the table with one major difference being that manufacturing is usually less important in SSA.

2010, their share in total exports decreased from 0.9% in 2000 to 0.3% in 2010. Similarly, the value of exports of medium-technology and high-technology products has increased over the last ten years, but the overall importance in total exports to China of medium-technology manufactures dropped from 2.4% in 2000 to only 0.3% in 2010. The share of high-technology manufactures in total exports to China has shown a more promising picture and has increased from 0.1% in 2000 to 0.6% in 2010, but HTM still only accounts for a very small proportion of overall exports (author's calculations based on UN Comtrade).

Table 5.7
Technology Composition of SSA's Exports to China
(Lall's Classification, SITC 3-digit, Revision 2)

	Exports to China	
Commodity Group (% of total)	**2000**	**2010**
Primary Products	**81.21**	**76.40**
Resource-Based Manufactures	15.41	19.99
Low-Technology Manufactures	0.89	0.34
Medium-Technology Manufactures	2.38	2.63
High-Technology Manufactures	0.10	0.63
Total %	100	100

Source: Author's calculation based on UN Comtrade

Overall, PP accounted for a bulk of exports to China and about six countries accounted for more than half of the region's exports to China both in 2000 and 2010.

5.2.4.3 Natural Resource-exporting Countries

Although exports have risen dramatically, only a handful of Sub Saharan African countries have significant exports to China because these exports are concentrated in a small number of goods, such as oil and minerals. Only a small number of SSA countries are endowed with a substantial amount of these natural resources, therefore SSA exports to China are highly concentrated in these few countries. The primary trading partners for oil are Angola, Sudan, Nigeria, and Congo who send between 86% and 100% of their oil exports to China. The Democratic Republic of Congo (DRC) exports 99.6% of its minerals to China (Kaplinsky et al., 2010).

Most of the exports from the Sub-Saharan African region are concentrated in mineral fuel-exporting countries. China is an important trade partner for each of these countries. Over the past decade, China has reinforced their dependence on natural resources.

Table 5.6 identified the number of countries for which a certain group of commodities was the top export. Mineral fuels, lubricants and related materials were the top export for Angola, Congo, Rep., Equatorial Guinea, Nigeria, Sudan, and Cameroon in 2000. In 2010, this group of commodities remained the top export for all countries other than Cameroon and mineral fuels, lubricants and related materials rose to be the top export for Chad. Table 5.8 shows the structure of trade with China for these countries, both in 2000 and 2010. Four out of the seven countries in Table 5.3 are identified specifically as oil-exporting countries

by Zafar (2007). These four countries are Angola, Congo, Rep., Nigeria, and Sudan.

Table 5.8 shows that for all countries other than Cameroon, mineral fuels, lubricants and related materials constituted more than 80% of total exports to China both in 2000 and 2010. Even though for Cameroon the percentage share of this commodity group in total exports decreased, the absolute value of commodity Group 3 (SITC 1-digit) exports increased significantly over the last ten years. As we look at manufactured exports to China, we can see that in 2000, only Chad exported a significant share of its goods to China as low-technology and medium-technology products. However, the absolute value of the exports in these categories was very low; therefore, Chad cannot be considered as a strong exporter of manufactured goods in 2000.

Table 5.8
Export Structure for Selected Mineral Fuel-exporting SSA Countries
(Lall's Classification, SITC 3-digit, Revision 2)

	Total Exports to China (in millions)		Mineral fuel, lubricant, related material exports		PP		RBM		Low - Tech		Medium Tech		High Tech	
Exporter	**2000**	**2010**	**2000**	**2010**	**2000**	**2010**	**2000**	**2010**	**2000**	**2010**	**2000**	**2010**	**2000**	**2010**
Angola	1,842.7	22,815.0	**99.96**	**99.92**	99.96	99.95	0.04	0.05	0.00	0.00	0.00	0.00	0.00	0.00
Cameroon	138.0	460.9	**66.63**	**55.89**	28.41	9.07	14.23	5.68	N.A.	0.00	N.A.	0.00	N.A	0.00
Chad	0.01	495.8	**N.A.**	**99.50**	0.00	99.99	0.00	0.00	59.10	0.00	40.90	0.00	0.00	0.01
Congo, Rep.	323.7	3,122.3	**90.97**	**89.40**	91.56	91.62	8.43	8.38	0.01	0.00	0.00	0.00	0.00	0.00
Equatorial Guinea	319.5	598.7	**80.38**	**85.93**	80.38	85.93	19.62	14.07	0.00	0.00	0.00	0.00	0.00	0.00
Nigeria	307.3	1,071.6	**89.08**	**86.56**	91.81	86.44	8.17	8.69	0.02	3.16	0.00	1.70	0.00	0.01
Sudan	731.7	6,671.9	**99.69**	**98.44**	99.72	99.39	0.00	0.54	0.27	0.03	0.01	0.04	0.00	0.00

Source: Author's calculations based on UN Comtrade

According to Table 5.8, all countries experienced a decrease in the share of manufactured exports to China, with the exception of Nigeria whose share of low-technology exports to China increased from 0.02% to 3.16% and medium-technology exports increased from 0% to 1.7% of total exports to China. Interestingly, Nigeria is also the country for which China's importance in total exports stayed very low over the decade (see Table 5.9). For five out of the seven mineral fuel-exporting countries China's increasing significance over the past decade is evident as exports to China were a substantial share of world exports in 2000 and this share increased in the 2000-2010 period (see Table 5.9).

Table 5.9
Share of China in the Mineral Fuel-exporting Countries' Total Exports (%)

Country	2000	2010
Angola	23.39	45.69
Cameroon	6.37	11.13
Chad	0.01	16.11
Congo, Rep.	16.18	30.98
Equatorial Guinea	25.29	6.77
Nigeria	1.34	1.33
Sudan	43.21	61.66

Source: Author's calculations based on UN Comtrade

5.2.4.4 Manufactured Good-exporters

The second group of countries that I discuss in more depth are the countries, which had strong manufactured exports to the world in 2000. I investigate what happened to these exports over the last 10 years. I chose the countries where the sum of low-, medium-, and high-technology exports to the

world exceeded $10 million in 2000 and accounted for more than 30% of total exports. At the same time, I only selected countries for which full data were available for both 2000 and 2010.[13] These countries include Lesotho, Liberia, Madagascar, Mauritius, and South Africa. Overall, the countries were not able to take advantage of the huge opportunities offered by the Chinese market; at the same time, the share of manufactured exports (MX) in world exports decreased for most countries in this group over the past decade.

Table 5.10 shows China's share in total exports to the world in countries with a strong manufacturing sector. This table depicts a very different picture from Table 5.9, which showed China's share in total exports for mineral fuel-exporting countries. As we can see, China's increasing overall importance in total exports for mineral fuel-exporting countries is undeniable (see Table 5.9). Whereas, for manufacturing good-exporters, China's importance in total exports was small in 2000 and has only increased marginally for all countries other than Madagascar and South Africa (see Table 5.10). Although Madagascar increased its exports to China as a proportion of world exports, it still only exported less than 1% of its manufactured goods to China, most of which were concentrated in low-technology manufactures (see Tables 5.10 and 5.11). South Africa is discussed in greater detail later in this section.

[13] The data for the technological breakdown of exports to China in 2000 were not available for Cape Verde, Niger, Sierra Leone, and Swaziland. Therefore, they were excluded from the discussion even though they fulfilled the first two criteria for selecting manufactured good-exporting countries.

Table 5.10
China's Share in World Exports and in Total Manufactured Exports (%)

	Exports to China / Exports to the World[14]		MX to China / MX to the World	
Exporter	**2000**	**2010**	**2000**	**2010**
Lesotho	0.03	0.84	0.00	1.00
Liberia	4.58	2.35	0.00	0.02
Madagascar	0.68	8.74	0.04	0.97
Mauritius	1.80	0.47	0.01	0.38
South Africa	2.94	16.04	3.55	5.37

Source: Author's calculations based on UN Comtrade

If we look at MX specifically for the six countries in the group, we can see that China accounted for 1% or less of total manufactured exports both in 2000 and 2010 for all countries other than South Africa despite the fact that these are the countries that exported at least 30% of their products to the world as LTM, MTM or HTM.

Table 5.11 shows total exports to China for these countries both in 2000 and 2010 as well as the percentage share of LTM, MTM, and HTM in total exports to China.

[14] The table uses aggregate trade values - AG0 - from UN Comtrade.

Table 5.11
Export Structure for Selected SSA Countries with Strong Manufacturing Exports
(Lall's Classification, SITC 3-digit, Revision 2)

Exporter	Total Exports to China		LTM+MTM+HTM (Value)		LTM/TX		MTM/TX		HTM/TX	
	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010
Lesotho	51,210	4,528,511	0	3,306,364	0.00	6.02	0.00	65.64	0.00	1.36
Liberia	35,286,327	22,482,685	4,061	49,528	0.00	0.00	0.01	0.08	0.00	0.15
Madagascar	6,452,202	105,346,568	157,676	4,430,817	2.44	3.98	0.00	0.17	0.00	0.06
Mauritius	29,296,624	10,093,812	166,952	4,715,927	0.45	45.75	0.12	0.58	0.00	0.39
South Africa	718,458,284	11,492,656,407	155,786,955	1,509,183,647	5.53	0.86	15.58	12.01	0.58	0.26

Source: Author's calculations based on UN Comtrade[1]

[1] For some countries the technological breakdown data did not add up to the aggregate (AG0) values given because not all products are included in Lall's classification. In order to calculate the percentage share of PP, RBM, LTM, MTM, and HTM in total exports, I added up the export values of each technological classification and I used the calculated value as the total export value instead of using the AG0 figure.

The technological composition of trade shows that most countries concentrated their manufactured exports in low-technology manufactures with the exception of Lesotho, which exported 65% of its goods to China in the medium-technology classification. All of Lesotho's MTM exports to China can be explained by one product group (SITC 3-digit, commodity code: 772) - switchgear, etc. parts nes, which were valued at 2,972,452 USD in 2010. Therefore, although a high proportion of Lesotho's exports to China were medium-technology manufactured goods, these exports were not diversified and they were focused in one product group.

Since China represented such a small share in world exports for these specific countries, it is essential to consider what happened to the rest of the manufactured exports for the countries with strong manufactured exports. Table 5.12 shows the absolute values of the low-technology, medium-technology, and high-technology manufactured exports to the world both in 2000 and 2010 as well as the percentage shares in total exports.

Table 5.12
Manufactured Exports to the World for Selected SSA Countries.

Exporter	World LTM+MTM+HTM		(LTM+MTM+HTMto the world)/ Total Exports		LTM		MTM		HTM	
	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010
Lesotho	155,524,127	329,787,989	86.26	60.95	84.94	59.49	0.89	1.38	0.43	0.09
Liberia	441,592,855	308,034,038	57.58	35.28	0.28	0.15	56.89	34.91	0.41	0.22
Madagascar	412,471,152	455,078,563	44.20	42.75	43.41	40.93	0.66	1.48	0.13	0.35
Mauritius	1,168,008,965	1,251,089,359	73.09	59.68	68.10	46.92	3.62	10.16	1.36	2.61
South Africa	4,389,370,171	28,085,641,725	17.42	34.94	13.36	5.98	3.43	26.17	4.06	2.79

Source: Author's calculation based on UN Comtrade

Table 5.12 shows that the share of manufactured exports to the world as a percentage of total exports decreased for all countries with the exception of South Africa. Furthermore, Liberia even experienced a decrease in the absolute value of manufactured exports. At the same time, most countries exported low-technology manufactures, which are lower on the value chain compared to MTM and HTM.

South Africa is an exception among countries with strong manufacturing exports to the world because its total exports to China increased and the overall importance of China in total exports was more significant than in the other four countries. However, the share of MX to China in total exports to China decreased over the past decade in each technological category as we can see in Table 5.11. So, while South Africa significantly increased its exports to China, it increased its PP and RBM exports faster than its technology-intensive exports. Despite this, South Africa still managed to increase its MX to the world as a share of total exports. So, even though its exports to China have not become more technology-intensive, the manufactured exports to the rest of the world have stayed competitive.

Overall, the data indicate that the countries, which had the most promising manufacturing exports in 2000 were not able to take advantage of the huge Chinese market and they have not increased their MX to the world proportionally with the PP and RBM exports.[15] As discussed later under *indirect competitive* effects, there is strong evidence that increased competition from Chinese goods

[15] With the exception of South Africa.

has been crowding out manufactured goods from SSA in third markets (see Section 5.3.2). Therefore, this explains a part of the reason why the countries that had strong manufacturing sectors in 2000 were not able to substantially expand their manufacturing exports to the world.

5.2.4.5 Conclusions on the Export Structure

Overall, exports to China are highly concentrated in mineral fuel-exporting countries and over the past decade, these countries have become more dependent on their natural resource exports to China. However, China's importance remains very small in countries with strong manufacturing exports to the world and this has not changed over the last ten years for any of the countries in the selected group with South Africa as the only exception.

5.2.4.6 Complementary Effects

Although product concentration is usually perceived as a negative phenomenon, studies find that higher export concentration enhances growth effects of countries that export to China (Baliamoune-Lutz, 2011; Baliamoune-Lutz and Ndikumana, 2007). This can be explained by the fact that most countries that have highly concentrated exports to China specialize in oil; oil-exporting countries benefit from trade with China through enhanced growth because of the recent rise in commodity prices as well as in demand from China. However, at the

same time, Baliamoune-Lutz (2011) finds no empirical evidence to support the hypothesis that exports to China enhance growth unconditionally.

The finding that export concentration enhances growth is in line with Zafar's (2007) classification of "winners" and "losers" from trade with China. He identified oil-exporting countries as "winners" of the increasing Sino-African trade as they benefit from the increase in international prices of their exports. He estimates that oil prices, among other commodity prices, are likely to stay high. Zafar (2007) also classifies other resource-rich countries, such as Zambia, as "winners".

5.2.4.7 Competitive Effects

Although an increase in the prices and volume of raw material exports can be beneficial for the natural resource exporters, studies highlight that the increase in raw material prices can be very harmful for those countries that import these raw materials (Githinji, 2010; Zafar, 2007). Zafar identifies the oil-importing countries that are also textile exporters, like Madagascar and Mauritius, as the "losers" of the Sino-African trade relations because the prices of their natural resource imports have increased while the prices of manufactured exports have decreased partly due to China's influence on global prices. While the absolute value of their manufactured exports have increased over the past decade, overall, both countries export a smaller proportion of world exports as manufactured goods (see Table 5.10). Therefore, they have not been successful in strengthening

their manufactured exports and moving up the value chain. The third market effects are further explored in the next section.

China will have mixed effects on resource-rich countries that are also oil-importers (Zafar, 2007). Overall, as mentioned above, only a small number of oil-rich countries in Africa dominate oil exports. Out of 31 SSA countries for which data were available on WDI, fuel imports accounted for more than 15% of total imports for 17 countries. For 14 out of the 17 countries the fuel imports made up between 19% and 33% of total imports (author's calculation based on WDI). Hence, while a small number of oil-exporting countries benefit from the oil price boom, a large number of oil-importing countries have faced an increase in their commodity import prices.

Furthermore, the current boom in oil exports, which is a capital-intensive sector, is not likely to generate sustained growth because of low employment created through this sector and limited spillovers on the other sectors of the economy (Baliamoune-Lutz and Ndikumana, 2007).

5.3 Indirect Complementary and Competitive Effects[16]

Although *indirect* effects are harder to measure, some authors caution that *indirect* effects can be more important for a country's economy than *direct* effects (Kaplinsky and Messner, 2007). *Indirect* impacts are important as China

[16] Some of the studies in this section do not separate *direct* and *indirect* effects in their analysis and only give an overall picture of the effects. They were included in this section instead of the *direct* effects' section if there seemed to be a bigger emphasis on third market effects in the studies.

influences global demand and supply as well as prices and African goods can face fierce competition with Chinese products in third markets. Studies have tried to quantify to what extent China competes with and crowds out SSA exports in third markets.

An overwhelming majority of the studies show that although some countries benefit from China's influence on global prices in third markets, this is primarily true only if countries are natural resource-exporters; thus, most SSA countries face more threats than opportunities posed by China. Studies try to analyze the overall impact of China and all studies, with only one exception, conclude that net losses caused by China outweigh net benefits. The study that states that overall, gains through the Sino-African trade relations outweigh the losses, takes into account both *direct* and *indirect* effects and does not make separate conclusions for the two. This study is widely criticized in the literature by other authors for its measurement methods.

5.3.1 Complementary Effects

Overall, due to the great differences between the production structures of SSA and China, it could be argued that Chinese goods do not compete with African exports in third markets. Stevens and Kennan (2006) identify net trade balance losses - where trade losses outweigh trade gains - for only two countries in their study. Their study also concludes that more countries will be affected by China on the import side rather than on the export side.

A country is identified to experience a trade balance gain if it exports a good that China imports or if it imports a good that China exports; trade balance loss, on the other hand, is if a country imports a good that China also imports or if a country exports a good that China exports. The authors count products that are traded directly between the countries of interest and China as well as products traded in third markets, thus it encompasses both *direct* and *indirect* effects.

The study identifies that it does not take into account any quantification of the scale of these effects. So, this means that a trade loss in one commodity is not necessarily outweighed by a trade gain in another commodity between the same two countries, or vice versa. This can explain a part of the reason why only two out of the 27 SSA countries included in the study experience a net trade loss. Moreover, the negative impact of cheap Chinese imports on local producers is not included in the discussion (Goldstein *et al.* 2006).

5.3.2 Competitive Effects

In contrast to Stevens and Kennan (2006), other studies that analyze the Sino-African trade relations according to a similar framework of classifying countries as net "gainers" and "losers", show that net losses tend to outweigh net gains in third markets (Ademola et al., 2009; Zafar, 2007).

Villoria (2009) argues that China has triggered a decrease in world prices in major markets for manufactures, especially in textiles, wearing apparel, and footwear. While this has led to a decrease of import prices for African countries,

Villoria shows that the export prices for manufactured goods have also gone down, affecting the exporters of manufactured goods. Although countries benefit from cheaper imports, the reductions in export prices outweigh the decrease in import prices.[17] The author concludes that while effects vary from country to country, most countries are likely to lose from the expansion of China's manufacturing sector.

Several studies show that China has displaced SSA exports in third markets (Giovannetti and Sanfilippo, 2009; Geda and Meskel, 2007). Giovannetti and Sanfilippo (2009) carry out an econometric study to determine whether Chinese exports crowd out African goods. The authors use an "augmented" gravity model to run a regression for the 1995-2005 period using HS 6-digit data. The authors regress the change in exports (or in ln exports) on a number of independent variables including GDP growth, exports to China, bilateral distances between trading partners' most popular cities, dummies for whether a country is landlocked or not, and whether or not it participates in free trade agreements. I have summarized the coefficients on the independent variable of interest - Δ ln Chinese exports - in Table 5.13.

[17] Villoria (2009) uses an Economic Geographic Model to identify the manufacturing TOT of African exports. The data used include Kenya, Mauritius, and Southern Africa Customs Union (SACU) countries, which are the largest exporters of manufactured goods in SSA. SACU countries include Botswana, Lesotho, Namibia, South Africa, and Swaziland. The study uses data for the 1995-2006 period.

Table 5.13
Coefficients on Chinese Exports, 1995 - 2005

	Coefficient on Δ ln Chinese exports
Full sample	-0.070 (10.75)***
Manufacturing	-0.072 (10.69)***
Food, beverage & tobacco	0.041 (2.12)***
Textiles, apparel and leather	-0.067 (3.31)***
Wood & wood products	-0.031 (0.51)
Paper & paper products	-0.007 (0.22)
Chemicals	-0.091 (6.39)***
Non-metallic mineral products	-0.095 (3.11)***
Basic metals	-0.051 (1.78)*
Machinery & equipment	-0.118 (9.94)***
Other manufacturing industries	-0.061 (2.00)***
By main market	
USA, France, Germany, Italy	-0.057 (2.17)**
Africa	0.030 (1.78)*
SSA	-0.074 (3.90)***

Note: z-stat in parentheses, * denotes significant at 10%, ** - significant at 5%, *** - significant at 1%
Source: Giovannetti and Sanfilippo (2009)

The regression results show that there is a negative relation between African countries' manufactured exports and Chinese exports to third markets in every industrial category except food, beverage and tobacco. The coefficients are

significant for all products except for wood and wood manufacturing, and paper and paper manufacturing. The overall effect is that a 1% increase in Chinese exports to the world results in a decline of 0.07 % of African exports of the same product to the world. The effects are most dramatic for machinery and equipment manufacturing - a 1% increase in Chinese exports results in a decline of 0.12 % of African exports of the same product. Furthermore, the study finds that Chinese exports negatively affect Africa's exports to its major trading partners as well as exports to SSA countries. The coefficient is statistically significant in both cases.

Jenkins (2008) criticizes the existing empirical measurements of Chinese competition and argues that these methods underestimate the extent to which China poses a threat for other economies. He develops the Static Index of Competitive Threat (SICT) and the Dynamic Index of Competitive Threat (DICT) to take into account the proportion of a country's "total exports accounted for by products in which China is globally competitive" (Jenkins, 2008, 8). Therefore SICT and DICT, unlike the existing measurement methods, take into account the extent to which China poses a competitive threat for other countries. SICT gives a static indicator of "the proportion of other countries' exports that are accounted for" by Chinese goods that have a revealed comparative advantage of more than one (Jenkins, 2008, 8). DICT identifies "the products where China's exports are growing more rapidly than world trade" measuring what proportion of other

countries' exports are facing a threat posed by China (Jenkins, 2008, 8). Table 5.14 summarizes the findings for the SSA countries.[18]

Table 5.14
Share of Exports Under Threat, 2002

Country	SICT	DICT	China's SICT
Cameroon	3	23	3
Ethiopia	27	26	3
Mozambique	17	67	4
Nigeria	2	2	2
South Africa	33	47	17
Uganda	34	41	4

Note: Columns (1) and (2) represent the rate of the listed country's total exports which are under threat from China. Column (3) represents the share of China's exports which are under threat from the listed country.
Source: Own elaboration from WTA data (Jenkins, 2008)

As we can see, Nigeria and Cameroon have almost no exports that compete with China, because they primarily export oil. On the other hand, Ethiopia, Mozambique, South Africa, and Uganda have a substantial share of their exports that compete with China. China, on the other hand, is not threatened by Africa's exports as indicated by the low China's SICT values. It would be interesting to see how the SICT and DICT values have changed since 2002. It is possible that the indices have decreased due to the crowding out effect of domestic producers because of the competitive threats from China. These indices

[18] Jenkins (2008) includes 18 countries out of which six are from Sub Saharan Africa.

would be complemented by researching what has happened to the products in the countries, which faced high SICT and DICT from China in 2002.

Githinji (2010) also tries to overcome some of the shortcomings of traditional measurement methods and derives a modified export similarity index (MESI), which takes into account the similarity of goods as a proportion of the total exports of the country of interest. Two MESI values are calculated to measure the relationship between two countries. So, the index recognizes that the threat posed by country A to country B is not the same as the threat that country B poses to country A. MESI also takes into account the importance of a specific export in total exports, but it also recognizes that The study shows that 17 out of 25 countries in the sample have a $MESI_1$ of over 50, which means that in the 17 countries, 50% of SSA countries faced competition from China. At the same time, the threat posed by China has gone up in the later years of the period studied - 1995-2003.[19]

Overall, the author finds that the MESI has increased by more than 30 points for Burundi, Ethiopia, Malawi, Togo, and Uganda, which are all primarily agricultural economies and for Zambia, which depends on mineral exports. It is not surprising that the oil-rich countries - Nigeria and Gabon - show a drop in the degree of competition; this could be due to an increase in oil prices for these countries as well as China's lack of oil reserves.

[19] The study also includes North African countries.

However, focusing on the existing similarity of exports between two countries ignores the fact that China harms SSA's future growth trajectories by limiting potential markets, which SSA producers could enter and take advantage of (Kaplinsky and Morris, 2007). This aspect will be further discussed in Chapter 6.

Some studies in the literature focus on the manufacturing sector specifically, as they identify the importance of this sector for developing countries. Some SSA countries have been able to advance low-technology manufacturing under the African Growth and Opportunities Act (AGOA). Kaplinsky and Messner (2007) cite the example of Lesotho, which took advantage of AGOA and substantially increased its clothing exports to the United States. When the Multi Fiber Agreement (MFA) quotas were removed in 2005-06, the countries that had originally been given preferential treatment faced Chinese competition. Although they benefited from the supply of fabrics from China that they used as inputs leading to *direct complementary* effects, the exposure to Chinese competition was often negative. It also led to a 15% fall in exports in 2004-06 in Lesotho. Table 5.11 also showed that manufactured exports as a percentage of total exports decreased significantly for Lesotho over the past decade.

Furthermore, Geda and Meskel (2007) found that China had been displacing African exports in third markets until 2000, but in the 2000-2005 period, the effect was *complementary* primarily because of AGOA. Kaplinsky and

Messner (2007) conclude that as preferential access to major markets gets phased out, any *complementary* effects that China brings to the African countries is outweighed by the *competitive* effects.

Discussing the phasing out of AGOA and the devastating potential effects on SSA economies as they openly face Chinese competition is essential because if we exclude South Africa, more than half of all SSA's manufactured exports are made up from clothing and textiles with the USA as the major exporting destinations. AGOA contributed to the competitiveness of African clothing and textile exports. Once quotas on China's exports to the US were removed, SSA's exports to the US fell by 26% (Kaplinksy and Messner, 2007). Thus, "a level playing field in global trade will be deleterious to export-oriented industrialization strategies in low-income economies" (Kaplinsky and Messner, 2007, 207).

5.4 Conclusion

Overall, my findings and the existing literature show that China poses substantial threats for SSA through *direct* trade interactions as well as third market effects. Generally, the studies convey a pessimistic view of the potential of export-oriented industrialization for SSA countries. This is in line with my findings that SSA countries that had strong manufactured exports in 2000 have not been able to take advantage of the Chinese market while they have faced increasing competition in third markets; thus, they have not been able to move up the technology ladder. Some studies highlight that not only does China pose a

huge threat for the existing exports of these countries, but it also limits the future opportunities for the SSA producers. Natural resource-exporters, on the other hand, benefit from the increased demand from China as well as the overall rise in commodity prices. The link between the *complementary* and *competitive* effects identified in this chapter and growth-inducing structural change is further explored in Chapter 6.

CHAPTER 6

EFFECTS ON STRUCTURAL CHANGE

The previous chapter studied *direct* Sino-African trade trends and *direct* and *indirect complementary* and *competitive* effects on SSA production and exports. My findings and the literature showed that while there are some signs of complementarity, overall, threats posed by China outweigh the benefits. This chapter will analyze whether the *complementary* and *competitive* effects from Chapter 5 lead to growth-inducing or growth-reducing structural change. In this chapter I conclude that generally, the Sino-African trade leads to growth-reducing structural change.

6.1 The Importance of Technological Composition of Trade for Structural Change

Chapter 2 discussed the importance of structural change for sustained growth and trade was later identified as an important impact channel for the structural shifts within individual economies. As noted in the synthetic framework in Chapter 4, even the *complementary* effects cannot ensure the movement of capital and labor towards more high value-added production. Although in the short run, countries may grow faster, the production and the export structure are important in determining whether the growth will be sustained or not. Lall (2000) states:

> "different export structures have different implications for growth and effects on domestic industrial development. Technology-intensive structures offer better prospects for future growth because their products tend to grow faster in trade: they tend to be highly income elastic, create new demand and substitute faster for older products" (page 339).

Lall adds that technology-intensive structures have higher learning capabilities and larger spillover effects (Guerrieri & Milana, 1998 as cited in Lall, 2000). Therefore, studying the technological structure of trade with China is essential in determining what happens to long-term growth prospects of SSA.

6.2 Trade Trends and the Link to Structural Change

As I discussed in Chapter 2, countries that have successfully achieved sustained growth have had to defeat their comparative advantage in order to develop industries in high value-added production. However, generally, trade flows between the Sub-Saharan African region and China follow the comparative advantage theory as predicted by the Heckscher-Ohlin model (Zafar, 2007). Over the last 10 years, African countries have increasingly relied on manufactured imports from China while they have increased their PP and RBM exports to China as evidence in Chapter 5. Thus, the overall trade structure of the 2000-2010 period does not facilitate the movement of capital and labor higher up the value chain. This is primarily because growth-inducing structural change is unlikely to occur when a country conforms to its comparative advantage lower in the value chain as physical and human capital are accumulated in the specific industries in

which a country operates (Chang, 2009). At the same time, although the mining sector is generally high value-added, increasing production in this sector does not lead to broad-based structural change or to sustained growth.

There is potential for countries to benefit from manufactured imports from China through technological learning such as reverse engineering and imitation; however, the evidence shows otherwise. As discussed in the previous chapter, the study that analyzes the transfer of productivity-enhancing technology to the manufacturing sector of SSA countries finds that trade openness with China does not affect the growth rate of TFP and in some cases it even decreased TFP growth as it outcompeted African producers and exports (Elu and Price, 2010).

6.2.1 Natural Resource-exporters

An increase in export prices and volumes to China was identified as a *direct complementary* effect in Kaplinsky's synthetic framework utilized in Chapter 4 (Figure 4.2). The surge in export prices and volumes within SSA is mainly true for natural resource-exporting countries. The short-term benefits for resource-rich countries is evidenced by the impressive rates of growth in SSA over the past decade, unlike the growth rates over the period leading up to the 2000s (see Chapter 3). However, export concentration in natural resources does not lead to growth-inducing structural change. Exporting natural resources encourages countries to continue exporting products, which are produced in industries that absorb little labor and have few backward and forward linkages

and limited spillover effects with little prospect for broad-based growth-inducing structural change.

Some studies do identify oil and commodity exports as a positive phenomenon for SSA countries due to these positive effects on the short-run growth. However, traditionally, diversification has been the main driver of sustained growth, not concentration (Baliamoune-Lutz and Ndikumana, 2007). "Diversification allows a country to sustain higher growth by increasing its resilience to shocks due to, among others, the vagaries of international commodity markets and weather changes" (Baliamoune-Lutz and Ndikumana, 2007, 14).

Despite the fact that raw material exports do not directly lead to growth-inducing structural change, if governments capture rents from raw material exports, they can be reinvested into the economy and can be used in developing infant industries higher up the value chain in order to achieve long-term growth. African countries have already identified the importance of capturing rents. South Africa, for example, is considering a 50% windfall tax on mining "super profits", while Ghana is planning to increase taxes on mining companies from 25% to 35% and at the same time to impose a 10% windfall tax on "super profits" (*The Economist*, 2012). However, corruption remains a pressing issue in most African countries and an increase in taxes does not ensure that the resources will be spent on ensuring long-term growth.

6.2.2 Manufactured Good-exporters

The data presented in the previous chapter also show that despite the significant increase in exports to China, manufactured exports make up only a small proportion of the overall exports. Therefore, as exports to China have increased, the manufactured good-exporters have not been able to take advantage of the Chinese market and the region has concentrated its exports in low-value added primary products and resource-based manufactures.

This phenomenon could be explained by the fact that as China's economy grows and China climbs up the technological ladder, it often stays in the low value-added good production at the same time (Githinji, 2010). Therefore, China does not significantly increase its demand for low-technology, medium-technology, and high-technology manufacture imports from other countries and it still meets the demand of other countries to a great extent. SSA is therefore forced to concentrate its exports to China and the world in PP and RBM, which is where most of the demand lies and where there is an absence of Chinese competition.

Therefore, the potential to export manufactured goods to China or third markets is greatly reduced because China does not free up this export space for SSA countries. The lack of potential markets is usually identified as more detrimental than the current competition with Chinese exports (Kaplinsky and Morris, 2007). While it is more difficult to measure the potential effects, they can also have detrimental effects on growth-reducing structural change.

Overall, the manufacturing sector is usually specifically highlighted in studies as the sector that is most threatened by the Chinese competition, creating barriers for achieving growth-inducing structural change.

6.3 The Change in the Structure of SSA Economies since 2000

In Chapter 3, I presented the structure of domestic production in SSA countries in 2000 (see Table 3.3). Table 6.1 shows the percentage share that each sector of the economy contributed to total GDP both in 2000 and 2010 as well as the percentage change over the past decade.

Table 6.1
Agriculture, Service, Industry Value Added (% of GDP) for SSA, Weighted Values, 2000 and 2010

Year	Agriculture	Services, etc.	Mining and Construction	Manufacturing	Total
2000	16.3	54.3	14.5	14.9	100
2010	10.7	58.6	18.2	12.6	100
% Change	-5.6	+4.3	+3.7	-2.3	

Source: WDI data, accessed on February 17th, 2012.

We can see that the manufacturing value added has decreased for the region as a whole. So, SSA countries have not successfully moved to high value-added production over the past decade. Although mining can also be high value-added, as outlined above, unlike the manufacturing sector, it does not have the

backward and forward linkages into the economy and spillover effects that would benefit the economy as a whole. Although the decrease in MVA cannot be solely attributed to trade with China, Chapter 5 showed that China crowds out manufactured exports in third markets. At the same time, the Sino-African trade structure reinforces SSA's dependence on natural resource exports and high-technology imports. Therefore, I can conclude that, China has contributed to the decrease in MVA. An in-depth econometric analysis would be necessary to quantify China's contribution to this decrease in MVA.

6.3.1 Natural Resource-exporters

Table 6.2 looks at the structure of the economies in the mineral fuel-exporting countries identified in Chapter 5. As we can see, half of the countries decreased their MVA over the past decade and the only country that has increased its MVA significantly, is Equatorial Guinea. Interestingly, Equatorial Guinea was also the only country in the mineral fuel-exporting country group that significantly decreased the share of its exports to China in total exports (see Chapter 5). Although, without an econometric analysis, I cannot conclude that this is why Equatorial Guinea increased its MVA, the trend is noteworthy.

Table 6.2
Agriculture, Service, Industry Value Added (% of GDP) for Mineral Fuel-Exporting Countries in SSA, Weighted Values, 2000 and 2010

	Agriculture, value added (% of GDP)		Services, etc. value added (% of GDP)		Manufacturing, value added (% of GDP)		Construction and mining, value added (%of GDP)	
Country	**2000**	**2010**	**2000**	**2010**	**2000**	**2010**	**2000**	**2010**
Angola	5.66	10.00	22.21	27.14	2.89	5.79	69.23	57.06
Cameroon***	22.14	19.47	41.85	49.98	20.83	16.51	15.18	14.13
Chad **	42.31	13.63	46.34	37.53	8.93	6.56	2.42	42.28
Congo, Rep.	5.30	3.85	22.54	15.93	3.48	3.84	68.68	76.37
Equatorial Guinea*	9.82	3.18	4.25	4.22	1.42	13.58	84.51	79.02
Nigeria***	N.A	32.71	N.A	26.63	N.A	2.58	N.A	38.07
Sudan	41.71	23.63	36.78	43.33	8.55	5.62	12.96	27.42

Note: Asterisk marks countries if the 2010 data were not available and the figures in the 2010 column were obtained from a different year. * denotes a 2009 figure, ** - 2008, *** - 2007.
Source: WDI data, accessed on February 17th, 2012.

6.3.2 Manufactured Good-exporters

Table 6.3 looks at the value added as a percentage of GDP from the different sectors of the economy for countries, which were identified to have strong manufacturing exports in 2000 (see Chapter 5). While most countries show an increase in MVA, it is difficult to conclude that this is due to China as exports to China accounted for a very small proportion of total exports for these countries. Interestingly, South Africa, which had the highest share of exports to China in total exports both in 2000 and 2010, has in fact decreased its MVA over the past decade. However, as mentioned in previous sections, an in-depth econometric

analysis is needed in order to understand the exact correlation between trade trends with China and MVA.

Table 6.3
Agriculture, Service, Industry Value Added (% of GDP) for Manufactured Good-Exporting Countries in SSA, Weighted Values, 2000 and 2010

Country	Agriculture, value added (% of GDP)		Services, etc. value added (% of GDP)		Manufacturing, value added (% of GDP)		Construction and mining, value added (%of GDP)	
Country	**2000**	**2010**	**2000**	**2010**	**2000**	**2010**	**2000**	**2010**
Lesotho	12.34	7.90	56.11	57.93	14.04	15.65	17.52	18.51
Liberia **	72.01	61.30	16.37	21.90	9.48	12.70	2.14	4.10
Madagascar *	29.21	29.11	56.56	54.89	12.24	14.14	1.99	1.86
Mauritius	6.97	4.23	62.06	67.17	23.48	19.07	7.49	9.53
South Africa *	3.27	3.04	64.94	65.66	18.98	15.17	12.80	16.13

Note: Asterisk marks countries if the 2010 data were not available and the figures in the 2010 column were obtained from a different year. * denotes a 2009 figure, ** - 2008.
Source: WDI data, accessed on February 17th, 2012.

6.4 Summing up the Effects of Sino-African Trade on Structural Change

Kaplinsky (2008) does not see a promising future for the manufacturing sector in SSA unless the African countries are successful in insulating infant industries from global competition, in particular from the Chinese competition. Kaplinsky and Messner (2007) talk about the drawbacks of having a level playing field in global trade for countries that are trying to achieve export-oriented industrialization. Therefore, the need for government's support in facilitating the development of industries higher up the value chain becomes evident. The rents

discussed earlier in the chapter can be used in this process. However, corruption remains an issue.

It could be argued that the combination of Chinese low wages and infrastructure along with higher productivity and undervalued exchange rate means that China can outcompete virtually any African country (Githinji, 2010). In line with Kjöllerström and Dallto's (2008) argument, Githinji suggests that there could be potential for non-traditional agricultural exports in some African countries, for example, Kenyan flower exports. Kaplinsky and Morris (2007) also point to the potential of innovation-intensive segments, but they believe that new markets can be developed not only in the agricultural, but also manufacturing and service sectors. Although theoretically these arguments seem strong, we know that historically, no country has ever achieved substantial rates of growth over a long period of time as a result of non-traditional agricultural exports.

Overall, based on current evidence, SSA countries' trade structure reflects their existing comparative advantage and trade with China does not necessarily facilitate the movement of capital and labor to higher value-added activities. China also limits potential opportunities for SSA exports. However, China's demand for natural resources can be an important source of revenue for facilitating the development of industries higher up the value chain if the governments manage to capture some of the rents and reinvest them into activities that lead to sustained growth.

CHAPTER 7

CONCLUSION

7.1 Summary of Main Arguments

China's rise has had important implications for economies around the globe. Sub Saharan Africa has also been significantly affected by China as the interactions between China and SSA have increased in the past decade. China's effects on SSA are mainly transmitted through the following channels: aid, trade, FDI, global governance, migration, and the environment. In order to fully understand the threats and opportunities that China poses for SSA, it is important to carefully research each impact channel.

My study focused specifically on trade due to the availability of data and the importance of this impact channel since China's accession to the WTO in 2001. I particularly focused on how the trade interactions affect the prospects for structural change in SSA. The arguments on the importance of structural change for sustained growth are rooted in theoretical arguments, empirical evidence, and the history of economic development.

In order to address the question of how Sino-African trade affects the prospects for structural change in SSA, I looked at the technological composition of imports and exports and how it has evolved over the past decade. The trade trends presented in the paper show that China has reinforced SSA's dependence

on natural resource exports. At the same time, manufacturing good-exporters have not been able to take advantage of the huge Chinese market of 1.3 billion people while they have faced increasing competition from China in third markets. On the import side, SSA has increasingly relied on Chinese manufactured products and the technology intensity of these imports has gone up over the decade. Exports to China are concentrated in only a small number of SSA countries while imports from China are significant for all countries in the region.

My findings based on data trends and the existing literature show that Sino-African trade interaction has complex outcomes. Overall, I conclude that China has not facilitated growth-inducing structural change in Sub Saharan African countries in the 2000-2010 period, while I emphasize that natural resource-exporters can utilize the rents generated from commodity exports to support the movement of labor and capital from low to high value-added activities.

7.2 Policy Implications

Chapter 2 clearly outlined the importance of structural change for sustained growth. The evidence presented in the rest of the paper showed that with liberalized trade regimes, underdeveloped SSA economies will find it difficult to move their production up the technology ladder towards more high value-added activities because of lack of competitiveness of SSA producers as

well as increasing competitiveness of China and China's influence on the global economic climate.

In terms of policy implications, it is crucial to take into account country specificities instead of giving general advice for the region as a whole because SSA countries differ in terms of their endowments, production capabilities, governance, history and cultural aspects among other factors. Nonetheless, if we consider the history of economic development, local producers within individual countries have needed state protection in order to facilitate growth-inducing structural change and sustained growth. Therefore, individual governments need to play a more active role to allow high value-added industries to develop.

History of economic development also shows that government protection may not generate the desirable outcomes and could lead to, for example, rent-seeking. Reciprocal control mechanisms - defined by Amsden (2001) as "a set of institutions that imposes discipline on economic behavior" (page 8) - are essential for ensuring that state protection leads to growth-inducing structural change and that with time, the protected industries become competitive on the international scale and are able to operate without state protection. The African countries that export natural resources have an advantage as they can use the rents from these exports to support the development of high value-added infant industries domestically. Others can use a mixture of tariff and non-tariff barriers including performance requirements to ensure that with time infant industries become competitive and benefit from liberalized trade. Overall, the key is to strike the

right balance between state and market to ensure that domestic economies develop.

7.3 Further Research

As highlighted above, it is essential to understand each impact channel and the challenges and opportunities it poses for SSA's development prospects in order to understand the full extent of China's influence. With respect to the trade channel, more research is needed on technological spillovers through imitation and reverse engineering from manufactured goods imported from China. At the same time, it is important to fully understand to what extent Chinese goods crowd out domestic producers; therefore, a closer econometric analysis needs to be done in this field. However, firm-level data are not widely available for SSA producers. Additionally, the available data are not always reliable. Even when the necessary data are available, measurement difficulties arise in trying to measure China's influence on SSA producers and exports.

The studies need to take into account not only the current production capabilities and export similarities but also future opportunities. While the current production and export structure of SSA countries may not be similar to that of China, China limits the possibilities of SSA to move up the technological ladder. This is because China has stayed competitive in low-technology production thanks to its large labor force while it has also successfully moved up the technology ladder thanks to its technological know-how and skilled labor.

Also, more research is needed on SSA exports to China as well as the third market effects. Although natural resource exports to China have increased significantly over the past decade, it is important to study who captures the revenues from these exports and whether and how they are reinvested into the economy. Also, more research needs to be done on whether manufactured exporters have been able to take advantage of the Chinese market. Several studies have shown that SSA exports, especially manufactured goods, are outcompeted in third markets. A more in-depth country-specific analysis is necessary in order to fully understand the extent of third market effects.

Overall, China's effects on SSA need to be studied and analyzed in greater detail in order to fully understand whether China contributes to SSA's structural change or limits SSA's prospects to settle on a growth trajectory. The existing evidence suggests that threats posed by China tend to outweigh the benefits, and that, over the past decade, China has not facilitated broad-based growth-inducing structural change in SSA.

APPENDIX 1
TECHNOLOGICAL CLASSIFICATION OF EXPORTS

Classification	Description	Examples
PP	Natural products that do not need technological processing	Fresh fruit, tea, gas, coal
RBM	"Simple and labor-intensive products", but some sectors use "capital-, scale- and skill-intensive technologies"	Processed food or leather, refined petroleum
LTM	Uses "stable, well-diffused technologies" and simple skill requirements	Clothing, footwear, furniture
MTM	Uses complex technologies, usually with high levels of R&D, advanced skills and long learning periods	Vehicles and parts, chemicals, plastics
HTM	Products that have "advanced and fast-changing technologies, with high R&D investments and prime emphasis on product design"; require advanced skills	TVs, pharmaceuticals, turbines

Source: Lall (2000, 341 - 342)

APPENDIX 2
ALL SUB-SAHARAN AFRICAN COUNTRIES

1	Angola	25	Madagascar
2	Benin	26	Malawi
3	Botswana	27	Mali
4	Burkina Faso	28	Mauritania
5	Burundi	29	Mauritius
6	Cameroon	30	Mozambique
7	Cape Verde	31	Namibia
8	Central African Republic	32	Niger
9	Chad	33	Nigeria
10	Comoros	34	Rwanda
11	Congo, Dem. Rep.	35	Sao Tome and Principe
12	Congo, Rep.	36	Senegal
13	Cote d'Ivoire	37	Seychelles
14	Equatorial Guinea	38	Sierra Leone
15	Eritrea	39	Somalia
16	Ethiopia	40	South Africa
17	Gabon	41	South Sudan
18	Gambia, The	42	Swaziland
19	Ghana	43	Tanzania
20	Guinea	44	Togo
21	Guinea-Bissau	45	Uganda
22	Kenya	46	Zambia
23	Lesotho	47	Zimbabwe
24	Liberia		

Source: Broadman (2007)

APPENDIX 3
SUB SAHARAN AFRICAN COUNTRY GROUPS BY INCOME

Low-income economies ($1,005 or less) in in Sub Saharan Africa	Lower-middle-income economies ($1,006 to $3,975) in Sub Saharan Africa
1. Gambia	1. Angola
2. Guinea	2. Cameroon
3. Benin	3. Cape Verde
4. Guinea-Bisau	4. Congo, Rep.
5. Niger	5. Cote d'Ivoire
6. Burkina Faso	6. Ghana
7. Rwanda	7. Lesotho
8. Burundi	8. Mauritania
9. Kenya	9. Nigeria
10. Sierra Leone	10. Sao Tome and Principe
11. Somalia	11. Senegal
12. Central African Republic	12. Sudan
13. Chad	13. Swaziland
14. Liberia	14. Zambia
15. Tanzania	
16. Comoros	
17. Madagascar	
18. Togo	
19. Congo, Dem. Rep	
20. Malawi	
21. Uganda	
22. Eritrea	
23. Mali	
24. Zimbabwe	
25. Ethiopia	
26. Mozambique	

APPENDIX 2
SUB SAHARAN AFRICAN COUNTRY GROUPS BY INCOME
(Continued)

Upper-middle-income economies
($3,976 to $12,275)
in Sub Saharan Africa

1. Botswana
2. Gabon
3. Mauritius
4. Namibia
5. Seychelles
6. South Africa

High-income economies
($12,276 or more)
in Sub Saharan Africa

1. Equatorial Guinea

Source: WDI. http://data.worldbank.org/about/country-classifications/country-and-lending-groups

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