



**MONASH** University

International Trade and African Economic  
Development

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A thesis submitted for the degree of Doctor of Philosophy at  
Monash University in 2020  
Department of Economics

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## Abstract

Economic growth models do not sufficiently explain or account for economic growth in Africa. This has led researchers to add the “Africa dummy” to growth models to better understand African economies. This thesis explores African economic growth in historical context and analyses how the recent globalisation of world economies in the form of trade liberalisation has affected the structure of present day African countries.

The second chapter estimates GDP per capita from the 1800s to 1950 for 16 African countries to provide a more robust understanding of present day GDP growth in Africa. The general understanding of African countries in the field of development economics is incomplete as it usually begins with the notion of the African continent being one where countries do not experience much economic progress (Jerven, 2015). This wrong idea has led to the wrong policies being forced upon African countries. Therefore, this chapter presents GDP estimates as far back as 1830 to see what African economic growth has been in the past to help inform our analysis of these economies. At the end of the second chapter, it is obvious that African countries have not only experienced economic decline but also long periods of growth.

In the next chapter, this thesis focuses on African economies in the late 19th century in order to understand their structure. African countries have joined the global market in an attempt to boost income and improve living standards. However, these countries have not experienced the growth and development expected. This chapter therefore analyses the effect of opening up to global trade on the labour markets in Africa by specifically looking at how trade openness impacted the rate of self-employment in Africa. I find that the degree of labour market rigidity is an important factor in how trade openness affects self-employment. While trade openness can reduce the rate of self-employment in a country, countries with more rigid labour market laws, when they open up to trade, may experience an increase in their rate of self-employment and a decrease in their share of employment in formal manufacturing because the

more rigid the labour market of a country is, the more difficult it is for workers to find a job.

In the third chapter, I seek to gain a better understanding of how international trade affected structural change in Africa. To do this, I look at a trade liberalisation episode and the difference in the structure of the economy before and after the episode. I use the generalised synthetic control methods developed by Xu (2017) to visualise the effect of trade liberalisation on the employment and value added shares of industry, agriculture and services in Africa using Ghana as a case study. I find that trade liberalisation may have caused the strange pattern of structural change that can be observed in most African countries. In most developed countries, the process of structural change involves moving from a high employment and value added share of agriculture towards manufacturing and then to services, however, in Africa, the shares seem to move from agriculture towards services bypassing the industrial sector. The industrial sector is very important in the process of economic growth. Without the growth of a formal manufacturing sector, African countries may not be able to experience rapid growth and income convergence with more advanced economies as Rodrik (2013) shows that the manufacturing sector is one with the potential to exhibit unconditional income convergence.

This thesis aims to encourage the appreciation of new insights on the nature of African economies in the body of research on development economics thereby leading to more appropriate policy recommendations for growth and development of African nations.

## Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma at any university or equivalent institution and that, to the best of my knowledge and belief, this thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

Signature: ..... ..

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Date: 22 August 2020

## Acknowledgement

Firstly I would like to thank the Almighty God for the opportunity, ability and grace to complete this PhD programme successfully.

I would also like to sincerely appreciate the valuable contributions of my Supervisors - Dr Solmaz Moslehi, Dr Qingyuan Du and Dr Nathan Lane, for all their help throughout the process. Without their guidance, this thesis would have been impossible. I am so grateful for their support and patience in helping me be a better researcher. I am especially thankful to my main Supervisor, Solmaz, for always providing helpful suggestions and pointing me in the right direction. I also thank Professor Jakob Madsen for his invaluable contributions to the second chapter of this thesis.

I am also grateful to the members of the PhD Milestone Committee, Associate Professor Horag Choi, Dr Laura Puzello and Dr Mita Bhattacharya, for their constructive feedback and valuable suggestions during my milestones.

This research was made possible by financial support from the Monash Graduate Scholarship (MGS) and the Monash Departmental Scholarship for which I am thankful. I appreciate the support from the administrative staff of the Business and Economics Graduate Research Degree.

I thank God for all my friends who have made this journey enjoyable and have impacted positively on my life. I am grateful for Ursula, Daniel, Ivana, Carolyn, Cassandra, Dami, Iremide, Justin and many others. I am also thankful for the love and support of my friends in SLC, Utah- Ruth, Ruth-Ann and Susanna

I also appreciate the love and joy that Dolapo, Sarah, Adunola and Tofarati: my sisters bring to my life.

Finally, I am immensely thankful for my parents, who have supported and encouraged me throughout my education. Words cannot express how much I appreciate you. This thesis is for you.

# 1 Introduction

Although some African countries have experienced some growth in the last few decades, the continent is home to some of the poorest and least developed countries in the world. This observation is somewhat surprising as most African countries joined the global trade market at least two decades ago. International trade is not only seen as an invaluable engine of economic growth but a sure way for developing countries to experience significant economic progress. (Edwards, 1993; IMF Staff, 2001). This thesis aims to provide a better understanding of African economies, what has been their economic trajectory from the 1800s and how has international trade impacted the structure of their present-day economy?

Economic growth models are not able to sufficiently explain economic growth in Africa. This has led some researchers to include the Africa dummy (a dummy variable that takes the value of 1 for sub-Saharan African countries and 0 for all other countries) in growth regressions to understand how being an African economy impacts economic growth (Kohler et al., 2011). The Africa dummy is negative and statistically significant in growth regressions indicating that being an African country has adverse effects on economic growth (Barro, 1991). In recent years though, the Africa dummy in growth regressions has become less negative even becoming positive after the 1990s (Kohler et al., 2001). This chapter aims contribute or add to the current understanding of African economies by first putting the recent African growth experience in historical context using international trade data to estimate national income from the 1800s and then focus on how international trade has affected the structure of African economies in more recent decades.

For a long time, the consensus in the literature on the effect of international trade on the economic performance of countries was that there is a positive relationship. For example, Balassa (1985) in a cross-sectional study of 43 developing countries between 1973 and 1978, finds that countries with outward-oriented trade policies were more likely to have favourable trade performance

in the period considered. In previous papers, Balassa (1978, 1984) uses cross-sectional data and simple regression methods to find evidence for export-led economic growth.

Similarly, Sachs et al. (1995) test the effect of trade openness on a larger sample of countries (up to 135 countries) for 1980 to 1979 and find similar results. Their results show a strong positive relationship between trade openness and growth in developing and developed countries. They conclude, after controlling for other factors that trade policy is a significant factor in economic growth and that protectionist policies can slow down a country's growth performance. Also, Wacziarg and Welch (2008) use new data for 1950 - 1998 to show that countries that liberalised trade had at least 1.5 per cent more average annual GDP growth rates than countries that did not. They examine a sub-sample of 13 developing countries and find that the level of commitment to sustained trade reforms and the timing of the reform amongst other macroeconomic factors influenced the extent to which economic growth was impacted by trade liberalisation.

The question of whether or not trade liberalisation is useful for growth and development in developing countries is widely discussed in development economics literature. Some researchers have also begun to zero in on African economies. Researchers like Rodrik (1998); Brückner and Lederman (2012) and Mullings and Mahabir (2018) (to name a few) have explored how opening up to international trade has affected African economies. Their analysis reveals that trade has caused economic growth in Africa. While Mullings and Mahabir show that foreign direct investment had a more substantial and more significant contribution to economic growth in Africa, Rodrik's analysis reveals that although its effects are smaller; the way trade policy affects African economic growth is much the same as it has affected other economies. That is, open trade policy has improved trade performance in the region, but it has had a more indirect and smaller effect on economic growth.

In developing countries, the impact of trade liberalisation depends on a number of factors, but trade liberalisation is usually recommended as essential

for ending poverty (World Bank, 2018). In the third chapter of the African Development Report published in 2017, the authors acknowledge that trade has been important for African growth of the last few decades and has helped these countries achieve the observed growth. However, although African trade has increased four folds in the past two decades, and there has been a diversification of the countries that African countries trade with, the component of African trade has remained relatively the same. They point out that in order to reap the benefits of opening up to international trade, Africa needs to focus on export diversification and productivity growth.

Although African countries have joined the global market, Africa's trade growth is weaker than other regions, and the continent lags behind in terms of global value chain integration. Most developing countries did not experience growth-enhancing structural change from trade liberalisation. Jung (2017) acknowledges that the continents sluggish structural transformation and dependence on commodity exports poses a problem for sustained economic growth. Shafaeddin (2005) analysed a sample of countries that undertook trade liberalisation policies as part of the Washington consensus' SAP's and finds varied results. He notes that trade liberalisation was only able to help industries that were close to maturity. Some of the countries that liberalised trade as part of the SAP's, including those in Africa and Latin America experienced deindustrialisation instead of positive structural transformation. This signifies that trade liberalisation may not be as essential for growth-enhancing structural change as it is proclaimed to be.<sup>1</sup>

In a slightly more alarming evaluation, Billmeier and Nannicini (2013) explain that African countries may have been harmed by opening up to international trade because of the timing of their joining the world market. By the time they joined the world market, the competition for capital and labour intensive goods were too high for African countries to reap many benefits from trade. This observation comes after finding that trade liberalisation had positive effects on economic growth in most except in some African countries where trade

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<sup>1</sup>See the report published by the World Bank in 1981

liberalisation had no significant effect.

This thesis, therefore, aims to first provide a better understanding of African economies by evaluating historical income levels then to understand how the recent opening up to international trade in Africa has affected the structure of African economies and therefore economic growth and development.

## **1.1 Contribution and Structure of the Thesis**

This thesis consists of two chapters that explore the impact of international trade on the structure of African economies. These two chapters are preceded by an attempt to put African National income figures in historical context by constructing historical GDP per capita data for 16 African countries. The aim is not only to understand African economies but to also explore the historical trajectory of African countries in trying to analyse these economies today.

It contributes to the literature on African economic history by presenting estimates of GDP per capita for 16 African countries as far back as 1830. Any study on African economies that does not consider their economic history is incomplete and lacking. This thesis fills in the gap recognised by Hopkins (2009) who presents a compelling case for why the study of African economic history needs to be revived. This is especially important when studying how to foster economic growth and reduce poverty. In this chapter, I use international trade data from the 1800's for Latin American countries to estimate the relationship between trade and GDP per capita. I then use the estimated relationship and African trade data from the 1800's to estimate GDP per capita for Africa from as early as 1830. The results reveal that there is potential for sustained economic growth in Africa because for much of it's history sustained economic growth was a reality.

The third chapter of this thesis looks at African economies in more recent decades to analyse how opening up to trade has affected the structure of labour markets in Africa, specifically the impact of trade openness on the rate of self-employment. The findings indicate that the way trade openness affects the

rate of self-employment in African countries depends on the degree of labour market rigidity which may be rooted in the historical background of a country. Botero et al. (2004) use the labour market regulations of 85 countries to show that the legal origins of a country largely influences its current labour laws.

The final chapter deals with the structural composition of the three main sectors (agriculture, industry and services) in GDP in Africa in the post-independence period and the effect of international trade on the composition in an attempt to understand this shared experience of post-independence decline in these countries. It evaluates the structural change outcomes of an African economy after trade liberalisation. Using the generalised synthetic control (GSC) method developed by Abadie et al. (2010), and Ghana as a case study the chapter finds that trade liberalisation may have led to structural change that was not growth-enhancing in Ghana. This is because the counterfactual of the SCM analysis shows that resources would have remained mainly in the agricultural sector and moved into the industrial sector in Ghana. Instead, the observed structural change in Ghana is one where resources moved from agriculture to services, bypassing the industrial sector in the process of economic growth.

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## **2 Chapter 2: Estimating GDP for 16 African countries from 1850 to 1950.**

### **Abstract:**

Africa suffers from a lack of reliable long-term GDP and economic growth data for international comparisons and long-run economic evaluations. This chapter estimates GDP per capita for 16 African countries from the early 1800s to 1950 using trade data. The results show that contrary to what is commonly believed, African economies have experienced periods of economic growth in the past and understanding of the economic history of African economies is vital for any attempt to foster sustainable growth and development in Africa.

**JEL:** E01; N77; O55

**Key Words:** Economic history; Economic growth in Africa

## 2.1 Introduction

The concept of GDP is a cornerstone of aggregate economics. It is often used to understand the state of any economy and compare it to other countries (Reid, 1968). However, GDP needs to be put in historical context to be a useful indicator of the state of an economy. More than half of African countries rank as underdeveloped on the human development index and as poor in the GDP ranking (UNDP,2018; World Economic Outlook Database, 2019). Why do we observe this pattern, and have these countries always been poor? Answering these questions will shed new light on our understanding of the African continent.

Most of the least developed nations of the world are Sub Saharan African, and their contribution to poverty statistics is quite substantial. However, Africa has not always been poor and behind (Jerven 2010). Figure 2A.1 in the appendix presents GDP per capita in Africa and East Asia from 1950 – 2016. African countries were doing slightly better than the East Asian countries from 1950 till the early 1960s. African economies around 1950 were prosperous with income from natural resources, while East Asian nations around the same time suffered from poverty due partly to World War II (Varathan, 2018). However, this trend is reversed in 1988 when East Asia began to do much better than Africa. A majority of African countries experienced economic decline in the 1980s for various reasons, including droughts, famine, civil war, and political unrest. In Ghana, an unexpected and devastating drought ravaged the country for most of 1983, this in addition to other socioeconomic shocks affected the economy negatively. In South Africa, civil unrest and apartheid while in Ethiopia and Sudan, the drought and resulting famine crisis of the 1980s was an epidemic that gained global attention. African countries have failed to grow alongside the rest of the world. Various factors have been hypothesised and tested as the reason for this phenomenon in Africa. See Table A1 for a summary.

Historical GDP figures are significant for providing a robust understanding of an economy and are essential for any successful endeavour to promote economic

development and alleviate poverty in Africa. The economic past of African countries retains an influence on their future. Long term GDP data can inform present-day public policy (Manning, 1990) and challenge the existing literature on Africa that tries only to explain the lack of growth in Africa instead of objectively analysing the long term economic growth and prospects of the continent (Jerven, 2015). In trying to combat poverty (one of the most pressing issues facing African countries today), economists must not neglect the history of economic development in Africa as it is central to the study of poverty (Hopkins, 2009). Besides, ignoring the economic history of these countries makes any study on poverty incomplete. Manning (2004) uses the former Dahomey kingdom (present-day Benin) as an example of the mistakes that can be made when a proper understanding of a country's historical economy is lacking. He explains that although historians have portrayed this economy as one that has experienced long term decline, the data tells a different story—one of steady albeit moderate economic growth in the face of various structural, economic and sociopolitical changes.

However, one issue that economic analysts run into in trying to understand African economies is that historical GDP figures for Africa are not available for comparison with present GDP figures. Almost all African countries suffer from a lack of reliable long-term national income and economic growth data for international comparisons and long-run economic evaluations for several reasons. Firstly, most present-day African countries were not always one country. African countries consist of different tribes of people that have been put together into one country as a result of colonisation. Besides, data was not historically collected and organised systematically in most African nations (Jerven, 2013).

In trying to understand African economies today, the lack of reliable economic data and information on these countries has not prevented researchers from confidently analysing them. For example, Collier and Gunning (1999) investigate Africa's "chronic failure of growth" by limiting their study to the years after 1960, and based on their analysis of the continent over the short

term, they recommend policies to reform their economies and foster economic progress. This sort of study that has no root in the continent's historical experiences is why economists often misunderstand the actual state of these economies. Not just researchers but some policymakers have also ignored African nations' economic history in trying to understand their economy. In fact, in the Berg Report published by The World Bank in 1981, the starting point of their analysis of African nations is the year 1960 (Hopkins, 2009).

One of the dangers of ignoring economic history in the analysis of an economy is the implementation of the wrong economic policies. The structural reforms that were pushed by the World Bank and IMF in the 1980s on African economies were based on the conclusive result of observing just a few years of the experiences of African economies. They analysed the economic failures of African economies when most of them were just gaining independence from their colonisers and still trying to set themselves up as independent nations. They peddled economic policy without accurate information on and understanding of the economies they were recommending policies for (Soludo and Mkandawire, 2003). The lack of adequate and reliable data has been a stumbling block for a comprehensive historical evaluation of Africa's economy (Jerven, 2010). Austin (2008) explains that economic analysis on Africa is based on a 'compression of history' because too much of the discussion about the continent is focused on only a small part of its history. Therefore the results, conclusions, and policy recommendations of research on African economies need to be taken with reservations because of the lack of long term GDP data (Jerven, 2013).

This chapter contributes to the ongoing analysis of Africa's economic growth by estimating GDP figures for 16 African countries from 1850 to 1950 using the relationship between trade and GDP for Latin American countries from the early 1800s to 1950. African trade records and population figures are then used in conjunction with other available data for each country to present a GDP trend for these countries. I use trade data not just because of its availability, but because it is a reliable way to make reasonable estimations

about African economies (Esousoura, 2012). International trade is well known to cause economic growth and has been used by some researchers to estimate GDP (Abeysinghe, 1998).

I use the relationship between international trade and GDP for a group of Latin American countries because these countries are similar to African countries in terms of the composition of their trade, their colonial history and economic development trajectory and because historical international trade records are readily available for these countries. Table 2.2 and 2.3 show that the Latin American countries used have a high proportion of commodities in their trade which is similar to African countries whose exports are mostly made of agricultural and commodity exports even till the present period. A UNCTAD(2019) report on the state of commodity dependence showed that close to 90% of African countries were commodity-dependent between 2013 and 2017. A country is considered commodity-dependent if more than 60% of its merchandise exports are in commodities. In addition, the colonial history of the Latin American and African countries considered in this paper are similar in the sense that the nature of colonial rule was extractive around the same period.

Esousoura (2012), who also attempted to construct GDP figures for Africa from 1870 to 1950, used the relationship between international trade and GDP for African countries between 1950 and 1990 to estimate those GDP figures. However, Esousoura's approach is contingent on the relationship between trade and GDP in Africa in 1950-1970 being similar to the relationship between trade and GDP in Africa in the late 18th and early 19th centuries. African countries were at very different stages of development in those two time periods. The period between 1950 and 1970 was one where most African countries experienced significant changes as they either gained independence from their colonial masters right before or within this period or were at least fighting for independence. In this period, international trade can be expected to look reasonably different to trade in the late 18th century to the early 19th century in Africa.

This study finds that the economic failures of Sub-Saharan Africa over the last few decades is not necessarily the only experience of the African continent over time. Other papers that have tried to study Africa's economy historically also find the same thing. Jerven (2010) shows that contrary to what is generally believed, Sub-Saharan Africa's experiences have not been limited to economic busts and failures. However, they have experienced economic boom and growth and economic decline in different cycles and periods of their history. Also, Esousoura (2012) explains that Sub-Saharan Africa's decline has been a gradual process. The economies experienced some economic growth in the pre-independence period.

This chapter aims to provide insight into African economic history and how they have shaped African economies today by presenting a standardised data set on GDP figures for African economies from the 1800s till 1950 and then updating the data to the 2000s to compare it to the widely accepted short-run GDP data. This kind of information will help foster sustainable growth and development in poor African nations.

The next section presents an overview of the attempts to evaluate African economies before 1950, and the methods used will be explored. The section after that will explain and defend the method used in this chapter. The GDP per capita estimates will then be presented and analysed.

## **2.2 Literature Review**

This section will explore the literature on the importance of and the existing attempts to estimate historical GDP figures.

### **2.2.1 The importance of historical data**

It has become increasingly popular to look at historical events in trying to explain long term economic development (Nunn, 2009). A lot of the work

done in this area has highlighted that historical background can matter for the long-run economic development of a country.

Acemoglu et al. (2001) point out that that the nature of the colonial rule that a country experienced (whether it was extractive or if colonisers settled into the country) which in itself was determined by the characteristics of a country is one of the many factors that determines the nature of the institutions that a country has today. Therefore the colonial experience of a nation can affect long term economic development.

In addition, Botero et al., 2004 in their analysis of the employment laws of 85 countries found that the mode of regulation of the labour market in a given country is largely determined by the countries colonial origins. They found that countries with legal roots in common law had more flexible labour markets than countries with civil law backgrounds. Their findings stem out of a body of research that was inspired by La Porta et al. (1997,1998). Their research was one of the first to show that the colonial masters broadly impact the legal systems of a country.

### **2.2.2 Existing attempts to construct GDP data**

Any attempt to create long-run income data for African countries will have to be based on limited information being sourced together to form a cohesive understanding of their economies. This is because as explained before, long-run historical data for Africa has not been collected or recorded in a systematic and organised manner. Nevertheless, there has been some effort to construct national income statistics for Africa dating back to 1800.

Esousoura (2012) constructs estimates of GDP per capita using trade data in order to evaluate African economies before and after independence. He presents GDP per capita figures for 50 African countries from 1870-1950 using the econometric approach. In this approach, he estimates the relationship between income terms of trade (*ITT*), and GDP per capita for African countries from 1950 – 1990 using fixed effects regression to establish this relationship.

He then uses this relationship to infer real GDP per head for earlier periods. In using income terms of trade, Esousoura lumps the effect of real export volumes and commodity terms of trade on real income per capita together and assumes the same magnitude of their impact on GDP per head between 1950 and 1990 and historically.

$$\begin{aligned}
 ITT &= V_{ex}/P_{im} \\
 &= P_{ex} * Q_{ex}/P_{im} \\
 &= TOT * Q_{ex}
 \end{aligned}$$

*ITT* in the equation above is simply commodity terms of trade (*TOT*) multiplied by export volume  $Q_{ex}$  which is calculated using export value  $V_{ex}$  and import prices  $P_{im}$ . In this chapter, I use an approach similar to Esousoura. However, instead of evaluating the effect of income terms of trade in Africa on GDP, I assess the effect of export quantities and terms of trade separately on GDP between 1830 and 1950 for seven Latin American countries for a more accurate calculation of their effect on income per capita. Esousoura likely uses *ITT* because export volume and terms of trade data for African countries are not as readily available. However, in his calculation of *ITT* British export prices are used as a proxy for African import prices. This makes his results more questionable as British export prices may not be a good proxy for African import prices in the years 1950 to 1990. For example, the composition of African imports between 1950 and 1955 presented in the United Nations Review of Economic Activity in Africa 1950 to 1954 (1955) shows that Africa imported from other countries such as the United States and Japan not just from Britain. Nevertheless, it was a good attempt at estimating economic growth in African historically. I also use data for Latin American countries from 1830 to 1950 to estimate the effects of trade on GDP for that period to construct GDP figures because as explained before, that is likely a more accurate representation of the elasticities than when data for African countries from 1950 to 1970 is used to construct GDP figures for earlier periods.

Nunes et al. (1989) take a similar approach when constructing Portuguese

GDP data. They estimate the effect of exports, fiscal receipts and public expenditure for the years 1947 – 1985 on GDP. They use the elasticities to construct GDP for Portugal for a few benchmark years between 1851 and 1946. They used the Cochrane Orcutt regression method to calculate the elasticities, then collected data on the three variables for those benchmark years and therefore were able to create a GDP series. Like with Esousoura (2012), using data for 1947 to 1985 to construct GDP for earlier periods is questionable as even though the data is for the same country, the relationship between exports, fiscal receipts and public expenditure on GDP is likely to change over time.

Szerewzeski (1965) set out to understand the relationship between the resource endowment of the Gold Coast (now Ghana) and output in the years 1891, 1901 and 1911 because the economy experienced significant structural changes in these years. He estimated expenditure on GDP in Ghana by aggregating the data on export production, traditional consumption, gross capital formation, consumption of imports, government services and of public services. Jerven (2014) then uses Szerewzeski's estimates as a starting point for his forecasts of GDP per capita for Ghana from 1890 to 2010. He collected data on government expenditure, exports, imports and population from the British blue books and used that in conjunction with the information on the shares of the main sectors in GDP provided by Szerewzeski to calculate the annual change in each sector of the economy. Jerven and Szerewzeski both assume that the traditional sector grew in line with the population in Ghana and as such use population figures to calculate income in the traditional sector. Jerven's use of the share of government expenditure in the estimation may cause the growth rate derived to be overestimated because the share of government expenditure in GDP is increasing in all countries over time.

Using existing data for Egypt and other countries in the middle east, Pamuk (2006) starts with estimating per capita GDP for the most recent benchmark year and then works backwards using changes in per capita GDP. He uses the available data on agricultural production, which exists from around 1880,

foreign trade statistics and other available information on these economies to backdate existing data towards 1820. This method is useful but only where reliable data on production is available. On the other hand, Yousef(2002) uses broad money and velocity of money to present a consistent dataset on GDP for Egypt from 1886 to 1945. He uses the financial relationship between the United Kingdom and Egypt to value the velocity of money in Egypt and available information on money in circulation and private and public deposits in the banking system to calculate broad money. While this method is a good way of calculating GDP where data is scarce, it likely overestimates income through the broad money variable because public and private deposits in the banking system tend to increase over time as people get more confident in the banking system. This is not necessarily due to an increase in income. The validity of this method could have been tested in this chapter, but data on M3 is not available for most African countries from the 1800s.

Frankema and Waijenburg (2012) show that the assumptions about GDP per capita and economic growth in Africa do not match with the available information about Africa from 1880 to 1965. Using British data on real wages of the unskilled urban male in 10 African countries, coupled with price data of commodities, they conclude that welfare in Africa in those periods was higher than reported and poverty has not always been characteristic of the African continent as it is now. However, real wages are approximate to real income per capita only when labour is paid its true marginal productivity, and labour share in total GDP is constant over time. This is illustrated below:

$$S^L = (W.L)/(Y.P) = (W/P).(L/Y)$$

$$(Y/L) = (1/S^L).(W/P)$$

$$\therefore(Y/L) \approx (W/P) \text{ iff } (1/S^L) \text{ is constant}$$

As shown above, real wages  $Y/L$  approximate to the marginal productivity of labour  $W/P$  if and only if the share of labour in GDP  $1/S^L$  is constant over time. But labour's share of income is not constant over time, so, real wages

are not necessarily a good enough picture of economic growth.

While Manning (1990) constructed data on export volumes adjusted for inflation and tax revenues for Cameroon and uses this to draw some conclusions about their historical economy, Manning's paper emphasizes the need for the historical evaluation of African economies to inform modern-day policies, understand the structures of these economies and ensure that African leaders can learn from their history so that the same mistakes are not made.

With how much research goes into understanding the failures of present-day African economies, not enough work has gone into understanding the historical economies of African countries. Therefore, an attempt to fill in the gaps in knowledge is not only essential but invaluable because these economies may never be appropriately understood and improved upon without this information.

## **2.3 Empirical Section**

In this section, the method employed to construct historical GDP for African countries and the data used is presented.

### **2.3.1 Method and data**

In order to get comparable results for each African country, a standardized method is used to construct economic growth figures. A lot of the information and data that usually goes into calculating national income are unrecorded for African economies historically. Some countries only have national accounts from 1970 and before the 1900s data on important macroeconomic variables such as consumption, income and prices are unavailable. This makes the process of constructing national income estimates for African economies difficult but not impossible. Because most of the information needed is unavailable, this chapter will only make a basic inference as to the possible rate of economic

growth and use that coupled with existing national income data to generate per capita income levels from the early 1800s till 1950.

In this chapter, international trade and share of agriculture in GDP data for a group of Latin American countries is used to estimate GDP per capita for African countries from 1850-1950. In the first step of the construction process data on trade, GDP, the share of agriculture in GDP and population are collected for the years 1810-2016 for seven Latin American countries: Argentina, Brazil, Chile, Colombia, Peru, Mexico and Venezuela. Then, using fixed effects regression with robust standard errors on the panel data in logs, the GDP per capita elasticities of exports quantity per capita, terms of trade and share of agriculture in GDP is calculated. The results are shown in column 1 of Table 2.1 below.

Table 2.1 presents the estimated effects of log export quantity per capita ( $\log_{\text{expc}}$ ), log terms of trade ( $\log_{\text{tot}}$ ) and share of agriculture in GDP ( $\text{soagdp}$ ) on GDP per capita for the group of seven Latin American countries ( $\text{nobs}$  is the number of observations). These are the coefficients that will be used in conjunction with data on these same variables for African countries to construct their GDP data. As can be observed in Table 2.1, these variables are significant at the 99% level of significance. Column 1 of table 2.1 presents the regression results using yearly data and column 2 presents the same regression results using the same data but with fifteen year moving averages. These coefficients are used to construct GDP per capita using moving averages data for Africa and both of the constructed GDP data are compared to each other in the robustness checks section of this chapter.

There are a few reasons why this study uses data for Latin American countries to get the coefficients that will be used in the construction process for African countries. Firstly, there is enough evidence to suggest that the Latin American countries chosen had a culture of collecting and recording data. The existence

	<i>Dependent variable:</i>	
	Log_GDP_Per_Capita (1)	Log_GDP_Per_Capita_MA (2)
Log Exports Per Capita	0.092*** (0.019)	
Log Terms of Trade	0.297*** (0.025)	
Share of Agriculture in GDP	-0.141*** (0.007)	
Log Exports Per Capita(MA)		0.093*** (0.025)
Log Terms of Trade(MA)		0.367*** (0.029)
Share of Agriculture in GDP(MA)		-0.135*** (0.007)
Observations	953	902
R <sup>2</sup>	0.469	0.484
Adjusted R <sup>2</sup>	0.315	0.337
F Statistic	217.330*** (df = 3; 737)	219.190*** (df = 3; 702)

*Note:*

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table 2.1: Regression Results

of national historical files that include a detailed analysis of these economies indicates that they collected data. These include the investigation carried out by Ferreres et al. (2010) in conjunction with the Norte y Sur Fundacion where comprehensive historical data on all parts of the Argentine economy from 1810 -2010 is presented. The study focused on the history of the economic and social systems in Argentina. Braul Llonca et al. (1998) also performed a similar investigation into the history of Chile's economy. They were able to put this research together using national historical files and available information on the Chilean economy from the 1800s. Braun et al. (2000) provided most of the required information for Brazil and others.

African countries also share a similar colonial history with the Latin American countries in the sense that they were under colonial rule for a long period of their history and the nature of colonial rule was extractive. In Latin America by the 15th century, most of the countries were colonised by the Spanish and the Portuguese (Kittleson, 2020). This is similar to Africa's experience of a parasitic relationship with Europe which also began in the 15th century (Adi, 2012) and led to major losses on resources.

Besides, as shown by table 2.2 below, these Latin American countries like African countries relied heavily on commodity and resource exports for trade (Middleton, 2019). Commodity exports here will refer to raw materials, naturally occurring resources and minerals found in the geography of a country that is then sold internationally. The commodities they exported were also similar to the goods that African countries exported. For example, two of the major export commodities of Colombia are tobacco and coffee. Tobacco was a major export of Malawi and coffee was and still is a major export of Madagascar. Brazil was a major sugar exporter. This is similar to the economy of Mauritius, where sugar was a major export commodity. Table 2.3 presents the major commodities exported by the Latin American and African countries considered in this paper where the information was available.

In constructing data that captures economic activity for Africa, international trade is of principal importance. In this chapter, real exports quantity per

Country	Period	% of Agriculture in total exports	% of commodities in total exports
Argentina	1864-1964	73	74.70
Brazil	1821-1951	NA	77.52
Chile	1844-1995	14.2	89.50
Colombia	1913-1929	66	74.00
Mexico	1821-1910	35.4	94.80
Peru	1824-1896	25.1	94.50
Venezuela	1830-1925	40-70	NA

*Note:*

See Appendix for Sources

*Note:*

Agriculture and Commodity Exports for African countries is close to 100% in this period as this was the main resources that were extracted and exported

Table 2.2: Percentage of Agriculture and Commodities in Total Exports

Year	Country	Commodity
LATIN AMERICA		
1860-1904	Argentina	Hides & Skins, Linseed ,Maize, Meat, Wheat, Wool
1820-1904	Brazil	Cocoa, Coffee, Cotton, Rubber, Sugar
1860-1904	Chile	Copper, Nitrate of Soda
1820-1904	Colombia	Coffee, Tobacco
1860-1904	Peru	Copper, Cotton, Rubber,Petroleum & Products, Silver, Sugar, Wool
1820-1904	Venezuela	Coffee
AFRICA		
1945-2010	Algeria	Must&Wine, Petroleum, Coffee
1865-2010	Angola	Coffee
1910-2010	Cameroon	Cocoa, Coffee
1826- 2010	Egypt	Cotton
1865-2010	Ghana	Cocoa
1865-2010	Madagascar	Coffee
1865-2010	Malawi	Tea, Tobacco
1826-2010	Mauritius	Sugar
1910-2010	Morocco	Citrus Fruits, Phosphates, Cashew Nuts
1910-2010	Mozambique	Copral, Coffee, Sisal
1865-2010	Nigeria	Cocoa, Ground Nuts, Palm Kernels, Palm Oil, Tin
1865-2010	Tanzania	Coffee, Cotton, Sisal
1865-2010	Tunisia	Lead, Olive Oil, Phosphates, Wheat, Iron Ore

*Note:*

Information on the major commodity exports of these countries is from Mitchell (2003)

Table 2.3: Major Commodity Exports.

capita is used to capture international trade. The quantity of exports is indicative of the production level in the country as a fraction of what is produced is exported. For Ghana, Jerven,(2014) constructs GDP figures for the years 1891 to 1950 and explains that export development was one of the major factors that drove growth while Esousoura (2015) notes that in the absence of GDP data before 1950, international trade data is a reasonable tool to estimate economic growth for African economies historically.

Terms of trade is another important economic variable in the estimation of GDP in Africa before 1950. It captures the volatility of the contribution of trade to GDP. It is calculated as export prices divided by import prices. Better terms of trade should *ceteris paribus* be an indicator of higher national income. As Blattman et al. (2004) note, countries trading in commodities more susceptible to volatility tends to be poorer. Terms of trade is important because the value-added of the mining sector per person in GDP, for example, is much higher than the value-added of the traditional sector in GDP as worker productivity in mining is higher (McMillan & Rodrik, 2011). Since mining is a major export sector in most African countries, when there is a commodity boom and more mining products are being exported, this changes the composition of GDP and leads to an increase in GDP. The government also often gets royalties from export boards, and so if export prices go up, there is a direct income effect as government income, and possibly spending goes up. Spending of workers in a booming export sector where export prices are higher will also increase in the case of favourable terms of trade, leading to increased GDP. Therefore it is essential to include this variable for a more accurate estimation of changes in GDP per capita.

The effect of the share of agriculture in GDP is greater where agricultural productivity is essential for economic growth (Banerjee, 2010). As African economies rely mainly on agricultural goods and natural resources for GDP, it is useful to include this variable in the estimation process. However, this has only been included for a few countries where the data was available. A helpful way to update this chapter would be to calculate the historical share of

agriculture in GDP to the 1800s for all African countries. This will be useful in giving a better understanding of these economies.

There are other factors that affect GDP per capita in any country that are not included in the regression because the data is not available for the period considered for both the Latin American and African country. However, in table 2A.1 in the appendix, I include the regression results when more variables are added to the regression where the data is available (for some of the countries, data is only available from 1960) and show that including more variables does not change the robustness of the results by much. Of course, it would be much better to include more variables in the regression and estimation process, however, since the data is not available, this is the best alternative. As explained earlier, long-run data is very important for historical comparison and proper evaluation of present-day African economies.

The next step of the construction process is to use the regression results from column 1 of table 2.1 in conjunction with existing African GDP data from Maddison's database (Bolt et al., 2018) to backtrack the GDP figures to 1850. The calculation process for income per capita is as follows:

$$y^T = y^M \cdot urb + y^S \cdot (1 - urb)$$

and  $y^T$  is total income per capita in a given country,  $y^M$  is the income per capita in the modern sector of the country which is the data that is constructed using the regression results in column 1 of table 2.1,  $urb$  is urbanisation rate,  $y^S$  is the income per capita in the traditional sector of the country. Eight hundred dollars signifies the dollar amount of the subsistence level of income. It is gotten by first considering Maddison's 1990 GK dollar 400 subsistence level of income, updating it to 735 dollars in 2011 US dollars using the world bank's CPI index for America. Also, using the world bank's lower bound of 1.90 dollars per day in 2011US dollars, the subsistence level of income is 740 dollars. This chapter then assumes 800 dollars as the subsistence level of income in developing countries because Maddison's and the world bank

figures are too low (Clark, 2009) but indicative of the income levels necessary for survival. This 800 dollars is still little but assuming that the people who live on subsistence do not depend solely on foods they purchase for calories and consumption and can consume some of what they produce, this figure is a good enough assumption. I use 300 when it's an impoverished country.

$Y^S$  therefore captures the traditional sector. It is essential, albeit quite difficult to capture the traditional sector when talking about national income in Africa. The traditional sector refers to economic activity outside the urban sector. Economic activity in the periphery where there is little international trade and people live more or less at subsistence levels of income. This sector is substantial in many developing countries like those in Africa (FAO, 2002). To ensure that this sector's contribution to GDP is calculated, data on urbanisation rate is used.

Thus, this chapter provides an estimate for GDP per capita based on international trade, population and agriculture. Estimating GDP in this way means that available information has been used to create a series that can provide information that was not already known and that can be built upon as more research goes into this area. In addition, growth in the traditional sector has been captured in such a way that it moves inverse to the rate of urbanisation. It is impossible to go back in time and actually calculate income in the traditional sector, so the arbitrary figure set by Maddison (2001) in his research on the historical economy of the world is as far as I know the best method to make reasonable inference into traditional sector income in historical African economies.

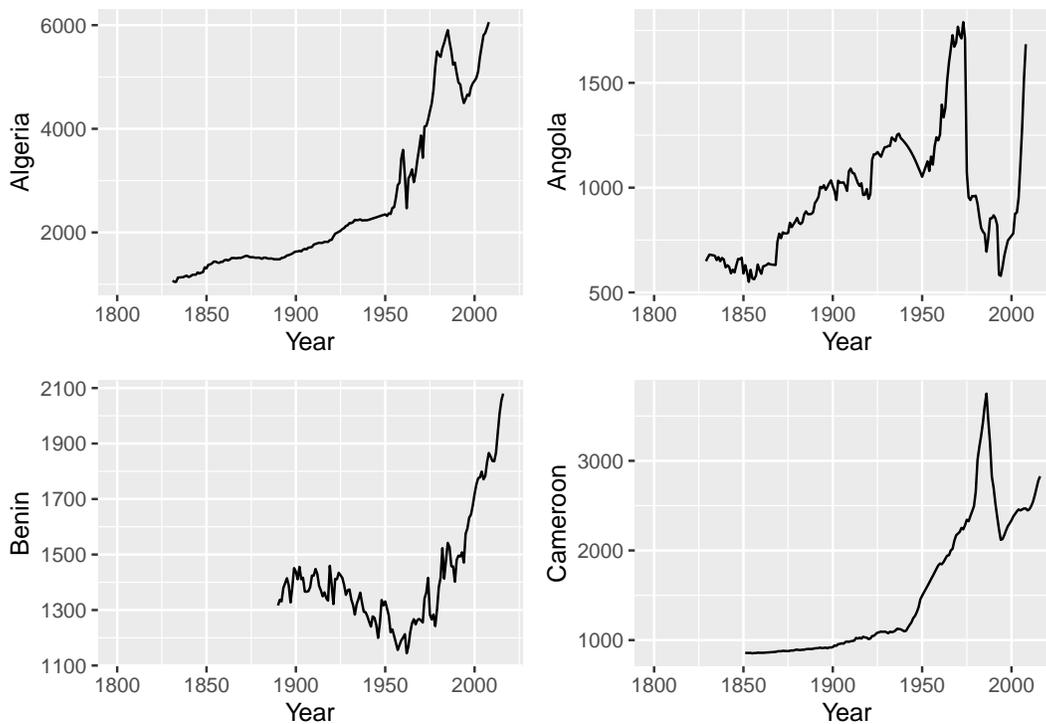
To summarise, this chapter uses the simple relationship between international trade and GDP per capita to estimate historical GDP per capita in African countries because data is lacking. Even though the final result will merely be carefully constructed conjectures using the information and data that is available, it is crucial to understand as much as is possible about that period in African history to start tackling the particular problems they face today. At the end of this endeavour, we would know the growth trends of the counties for

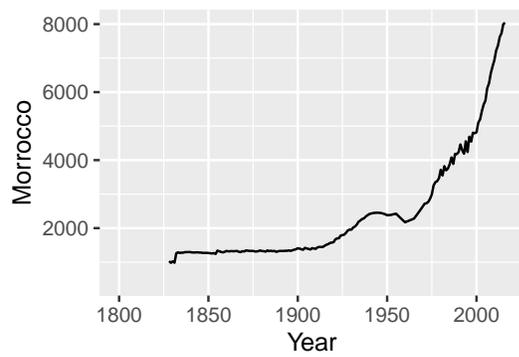
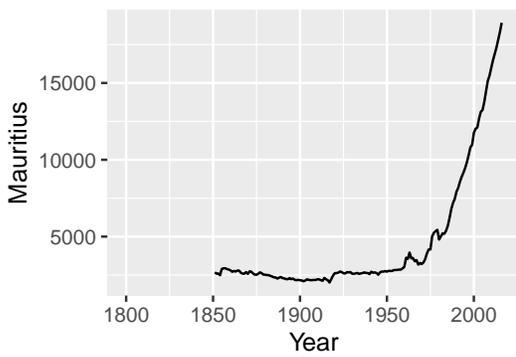
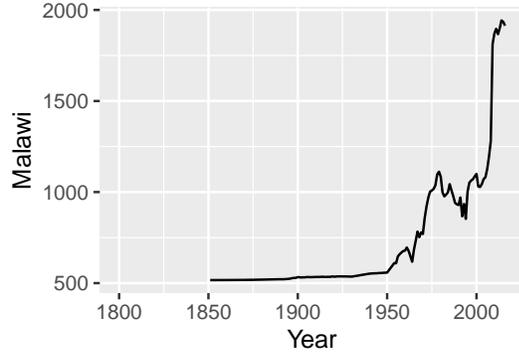
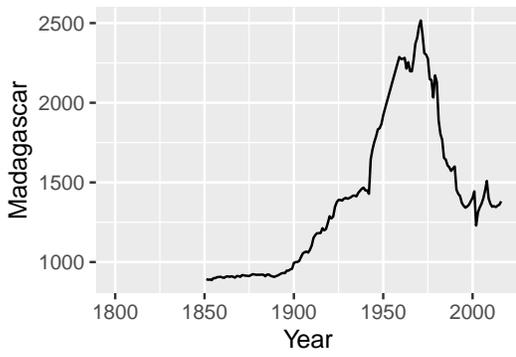
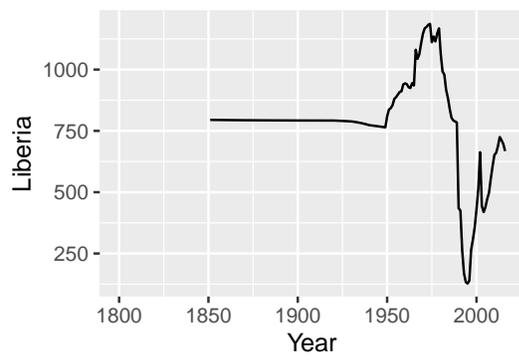
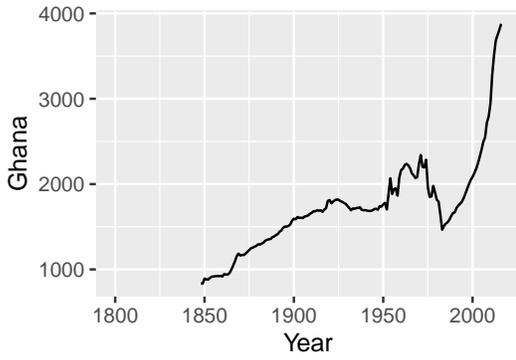
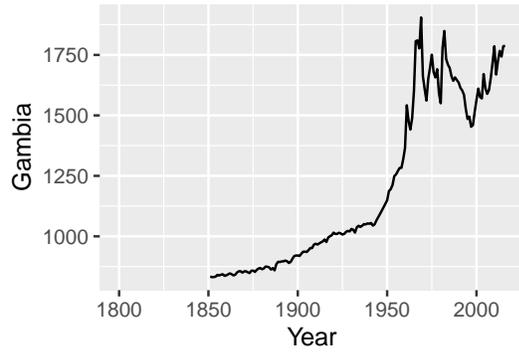
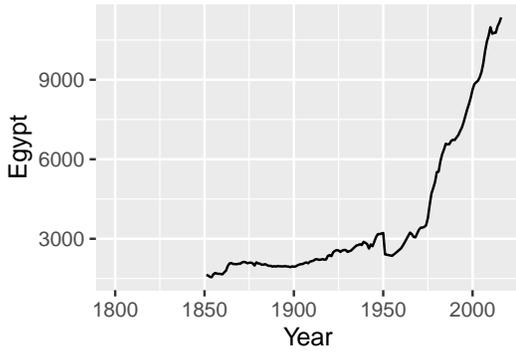
whom national income data is constructed, the general direction of economic activity in these countries, the peculiarities of different periods in African history and most importantly, a general idea of income per person in these countries over the long run.

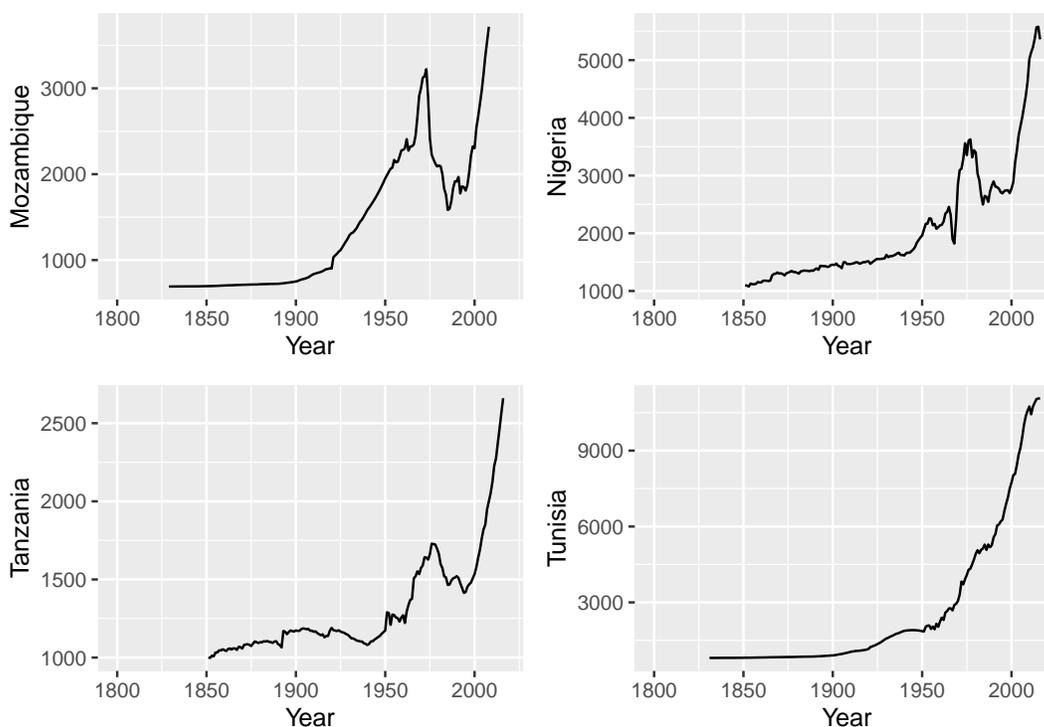
## 2.4 Data Constructed

In this section, the data constructed using the method outlined in the previous section is presented.

**Figure 2.1. GDP for 16 African countries: 1800's to 2016**







The results presented are estimates of GDP per capita for 16 African countries from as early as 1830 to 1950 based on available data and econometric estimations. The graphs are updated to 2016 to put the estimates in present-day context. As can be observed from figure 2.1, there has been an upward trend in GDP per capita in these African economies with some experiences of boom and busts for different reasons. Other than Liberia and Benin, GDP per capita generally followed an upward trend for these countries from the 1800s into the early 19th century. On average, between 1820 and 2016, GDP per capita grew 400% for these countries with most of the growth experience being between 1950 and 2008 where GDP per capita grew on average 194% while from 1820-1950, GDP per capita grew 84% on average.

As can be observed, although there is generally an upward trend in GDP for most of these countries, the rate of growth is higher from around 1900 to 1950. Also, from 1950 there is a sharp rise in GDP per capita in these countries. One factor that may explain this trend is the extractive nature of the slave

trade and the long term impacts that it had on African countries. Although the slave trade began in the 15th century and was abolished in the early 1800's (Adi, 2012), it continued well into the 19th century (Oliver & Atmore, 2005). The impact of the depletion of human and natural resources in this period was massive. There have been attempts to analyse and evaluate the effects of the slave trade and colonisation on African economies. For example, Nunn(2008) in a robust econometric analysis, finds that the slave trade had adverse negative impacts on the long term economic performance of African nations. This echoes Manning's observation in 1990 that the nature of the structure of African economies are largely influenced by their colonial roots and history of slavery. These countries may have seen a rise in the rate of growth in the 1900's and then a sharp rise in 1950 because the European activities of abducting African people and extractive colonialism was slowly declining over this period.

#### **2.4.1 Analysis of the data constructed**

By the end of the 18th century, the slave trade began to reduce, and colonial rule began to take place in Africa. This may explain why growth picks up in the early 19th century and gets even higher from 1950. Instead of being purely extractive, colonial rule involved some developments for African countries (although most of these developments were made solely to make it easier to take resources from Africa). Also, by the 1950's, some of these countries were already being self-governed and on their way to independence. Other than being free to rule, independence meant that the resources were used in the development of the country instead of just being extracted.

There is a general experience of GDP per capita decline after independence from colonisation. Many African countries gained independence between 1950 and 1970. These economies experienced steady growth and progress before and right after independence and then major economic decline. Although some African countries have begun to recover from the decline, African economies are still well behind as other countries were growing in this time and African

GDP was not that high, to begin with (Artadi & Sala-i-Martin, 2003).

According to Rodrik (1988), the fundamentals of economic growth are human resources, physical infrastructure, macroeconomic stability and the rule of law. Post-independence Africa is seriously lacking in these four areas. The structures of economic growth have changed over the past century but Africa is still stuck in the things that caused economic growth in the past. Africa was doing well before independence exporting primary commodities with comparatively low to moderate levels of physical infrastructure and human capital. However, there has not been much improvement since the 1800s. So even though African countries have experienced economic growth, they are still lagging behind the rest of the world where innovation, technology and human and physical capital improvements have caused economic progress.

#### **2.4.2 Individual country analysis of the data constructed**

In this subsection, I attempt to understand and explain the GDP per capita trend that was presented in figure 2.1 for some of the countries.

Before colonisation which began in Algeria around 1830, the economy was one of agriculture, animal husbandry, horticulture and the plantation of fruit trees (Bennoune, 2002). There was a broad regional specialisation amongst the tribes because of the geographical conditions of the area. There was an open commercial market system in place contrary to popular beliefs about tribal African economies. In an attempt for the highest return, the colonial settlers impoverished the land by specialising in the production of a few crops, over-exploiting the soil, ignoring animal husbandry which was a significant source of fertiliser for the soil. However, the total value of agricultural production did rise considerably from over 130 billion old francs in 1932 to 155 billion by 1955 with wine and cereals, representing 69% of the total value. Algeria experienced up to 130% growth between 1831 and 1962 when the country gained independence.

The GDP figures constructed for Benin show modest growth in their income

per capita. The period between 1840 and 1960 was one of major trade relations between Benin and Europe. Their significant exports were palm products and slaves, while the export of agricultural products slowly replaced the export of slaves as the slave trade became abolished in the early 1800s. (Manning, 1979) The Benin economy today relies mainly on re-exports to Nigeria (Golub et al., 2019).

The Cameroonian economy faced economic decline from 1986 till around 1993-1995, after enjoying prosperity after independence in 1960, due mainly to the fall in the price of all their major exports (timber, oil, coffee and cocoa) especially oil. This caused a massive deterioration in their economy. The decline was worsened by the structural adjustment programs that they eventually embarked on because of the pressure of the recession and the insistence of the IMF. (DeLancey and DeLancey, 2010) Cameroon had one of the highest income per capita in tropical Africa in 1986 then experienced economic decline because of the sharp drop in the prices of oil (Gately, 1986).

Ghana, like most African countries, has been involved in trans-Atlantic trade long before the 1800's even as early as the 13th century. Since then the economy has been involved in slave trade and then agricultural exports especially cacao after the Europeans introduced it in 1878. After gaining independence in 1957, the economy was doing well exporting mainly cocoa but faced trouble after a fall in the world price of cocoa in the mid-1960s and has been caught in a cycle of debt ever since. Cocoa production started to decline in the early 1970s, causing further and more sustained decline in the economy. The pressure of the declining economy coupled with a severe drought forced them to adopt the stringent structural adjustment programs imposed by the IMF in 1983. This program that encourages international exports and stricter fiscal policy was supported internationally and led the economy to face improvements but has led to lower standards of living for Ghanaians. (LaVerle, 1994)

The Madagascan economy faced extreme famine from 1930-31 (Kaufmann, 2000) and wars with the French in 1941 that significantly slowed down economic activity. Other than that, the economy experienced economic growth

till around 1971 when the tides changed to a steady but sure decline. The economy of Madagascar is mainly supported by agriculture, tourism, mining and textile industries. The economy faced major political reforms in the early 1970s after the growing discontent among the people over their extreme dependence on the French after their independence in 1960, and the poverty and income inequalities they experienced. The political climate of the 1970s leaned towards socialism in an attempt to improve the economic situation. However, by the 1980s, the economy still had per capita income that was one of the lowest in the world, and there was a rising population in Madagascar. This system of operating the economy also put the country deeply in debt, and they had to adopt the structural adjustment programs by the IMF in the late 1980s. (Chapin, 1994)

Malawi experienced steady GDP growth from 1894 and started to grow faster after 1963 when they gained independence. British colonial rule began in 1891 in Malawi. Although they experienced some economic progress from the British rule such as the expansion of the railway lines and transport systems, little was done to improve the welfare of the people because the British focused on their interests. After being forced into one protectorate with Northern Rhodesia in 1953, the nationalist movement gained momentum, and this led to their eventual separation from Northern Rhodesia in 1963 and independence from the British in 1964 (Mitchell, 2017). The Malawian economy grew at a faster rate than most sub-Saharan countries after independence. The economy progressed steadily from independence until the late 1970's when external shocks such as the decline of agricultural prices caused economic downturn. (Pryor, 1990)

Mauritius gained shocking economic improvements from around 1960. It has one of the highest GDP per capita in sub-Saharan Africa. The economy has recorded very high growth rates of up to 5% since 1970. This is due to the good macroeconomic policy, export oriented industrialisation and political stability to suitably protect the economy from economic shocks. The economy was able to diversify from having sugar as its major exports to investing in other sectors

like textiles and the manufacturing sector. The tourism sector is also a major source of income for Mauritius. (“Inside Mauritius”, 2015; YeungLamKo, 1998)

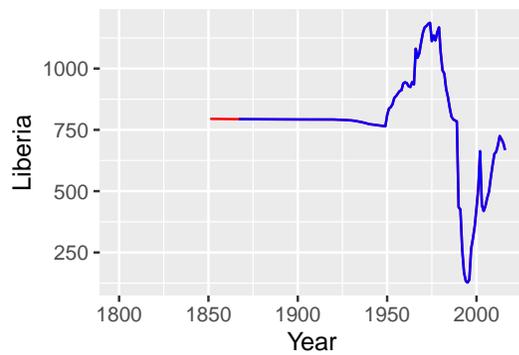
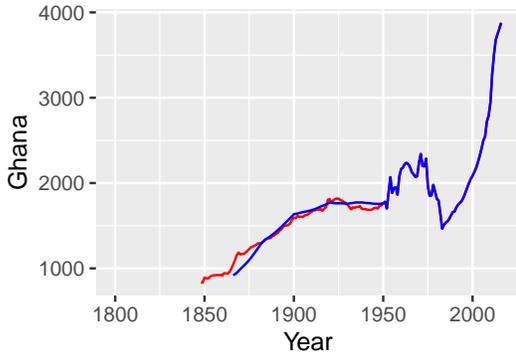
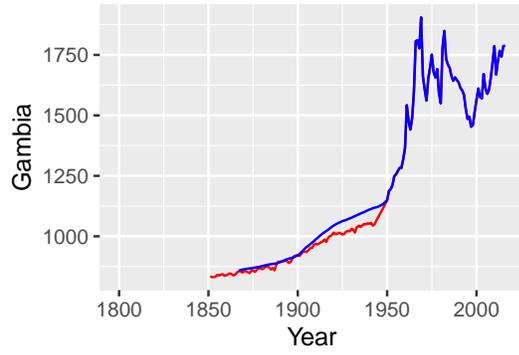
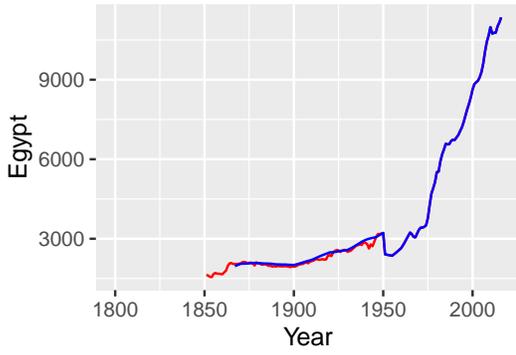
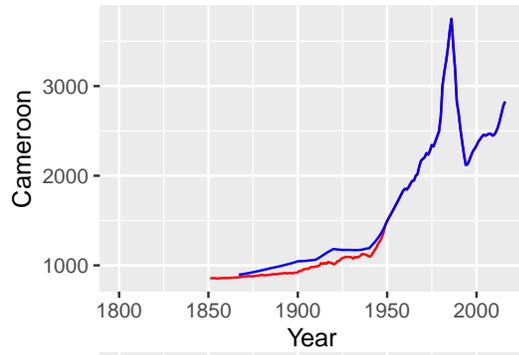
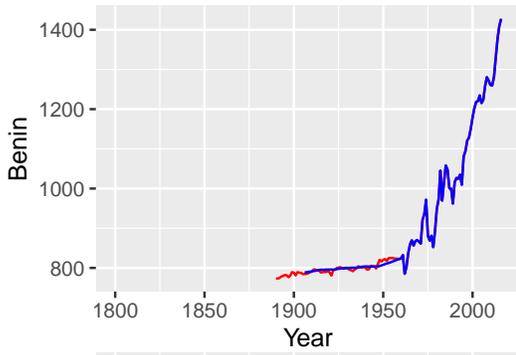
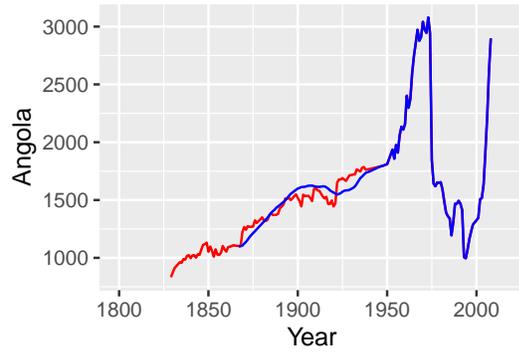
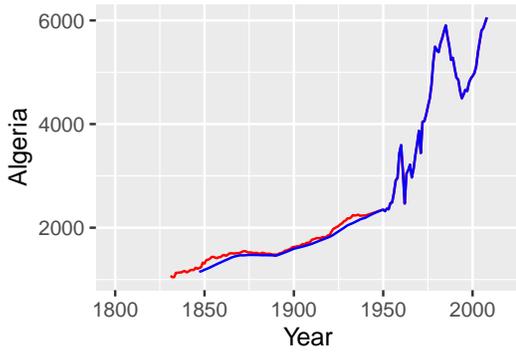
The Nigerian economy was an agriculture-based economy in the 1800s and early 1900s. During colonisation, the country exported rubber, cocoa, rice and other raw materials to Britain. After independence in 1960, Nigeria experienced economic progress shown in the rise in the country’s GDP per capita. The economy embarked on major macroeconomic changes to foster economic growth. Some of these changes include investment in human capital in the form of free access to primary and secondary education and free healthcare for all, investment in infrastructure and increased agricultural production amongst others. It grew steadily but experienced economic decline between 1965 and 1970 because of the devastating Biafran war. The economy picked up, and GDP per capita rose rapidly from 1970 as Nigeria started to export oil. From this point on Nigeria has depended on oil for up to 90% of GDP. The country also neglected the other sectors of the economy like agriculture. As a result of this and in conjunction with the rising population, Nigeria faced food shortages and was forced to import the majority of food consumed. GDP in Nigeria started to decline in the late 1970s till the early 1980s. Since then various economic reforms have been embarked on, and with the introduction of the telecommunications industry, the Nigerian economy has grown steadily since 1990 still heavily dependent on crude oil for GDP (Ekpo and Umoh, 2014; Ayoade-Alabi, 2015).

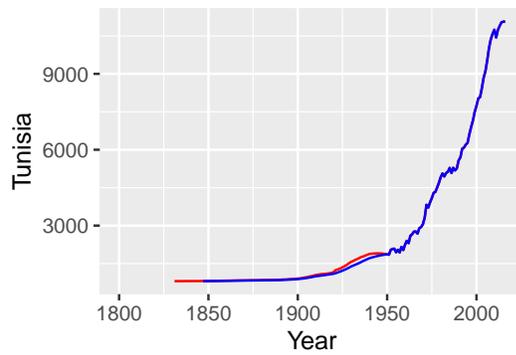
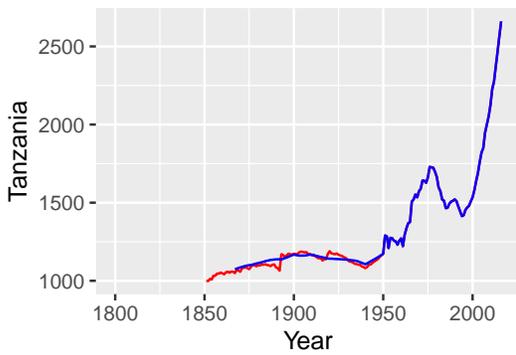
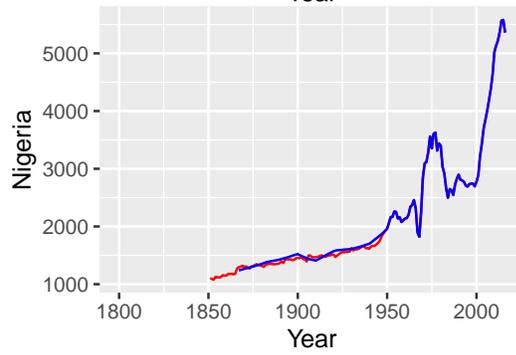
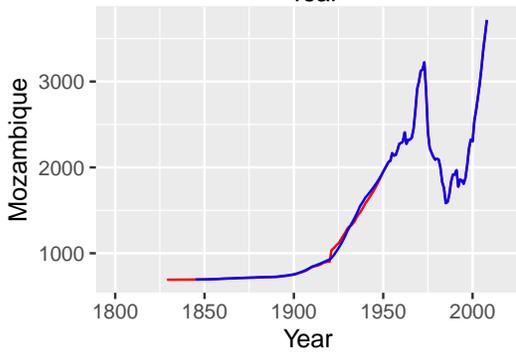
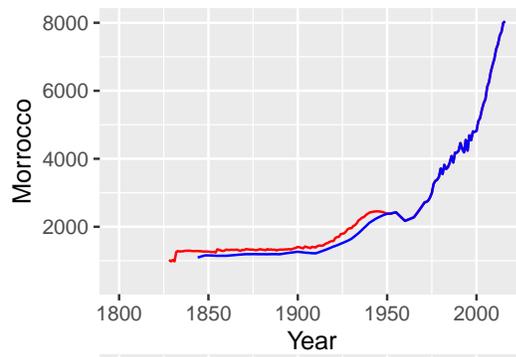
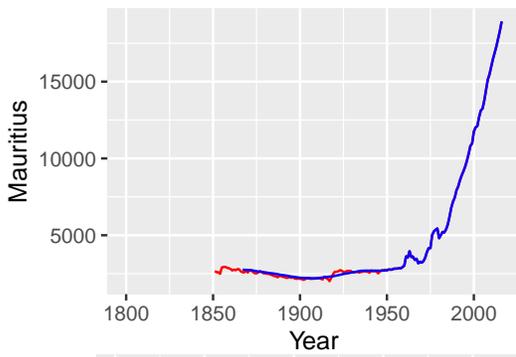
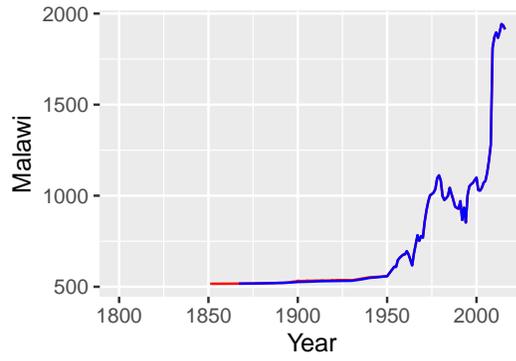
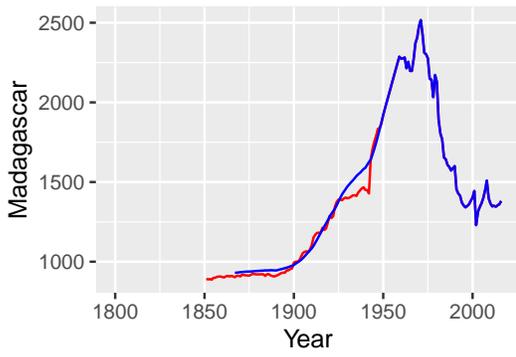
Tanzania also experienced very modest economic growth trend in the early 1900s and the growth rate picked up from the early 1960s when Tanzania gained independence from her colonial masters. The economy however faced decline in the 1970s and a financial crisis in the 1980s that caused GDP per capita growth to fall. (“Tanzania’s Economic Reforms”, 2017) They have been able to attain macroeconomic improvement, stability and sustainable economic development after undertaking an economic recovery program that involved significant structural reforms.

### 2.4.3 Robustness Checks

To reduce the noise in the data constructed and deal with the volatilities that developing countries usually face, I use the 15 year rolling average of the Latin American and African data to construct GDP per capita for Africa that is smooth and less noisy. The process is the same construction process described before, except here I use the moving averages of the data to construct GDP per capita. Basically, I use Latin American data to get the coefficient of the important variables by running a regression with GDP per capita as the dependent variable (column 2 of Table 2.1), then I use these coefficients in conjunction with African data for the same variables to construct GDP per capita for Africa. This is presented in figure 2.2 below. The GDP per capita data constructed with yearly data looks similar to the one that was constructed using fifteen year moving averages. For most of the countries there was not much structural break in the data.

**Figure 2.2. GDP per Capita using Rolling Averages for 16 African countries: 1800's to 1950**





## 2.5 Conclusion

This chapter set out to improve the general understanding of African economies by estimating historical GDP per capita figures for African countries. The econometric approach used in this chapter is similar to the one used in other papers which have estimated historical GDP per capita statistics where macroeconomic data from recent years is used to estimate historical GDP per capita figures. However, to provide better estimates, this chapter uses data from the period being estimated for a different group of countries who have characteristics that are close enough to the countries for whom data is being estimated.

The findings of this chapter indicate that African countries experienced economic growth as far back as the 1800's. However, the impact of the economic history of Africa cannot be separated from the nature of African nations today. In the 1800's although there was economic growth, GDP per capita in Africa was very low. The impacts of the extractive nature of slavery meant that resources for economic growth had dwindled and this resource extraction continued for most of the 1800's and even into the early 1900's. Even when slavery turned into colonisation, that did not mean the economic advancement of the African peoples.

In our understanding and analysis of African nations, their history must be taken into account. These countries are not just developing countries, but actually, they are "countries struggling to recover from being ruthlessly pillaged and systematically destabilised" (Laditan, 2018). Viewing African nations as countries that are struggling to recover from their adverse economic history as opposed to countries that fail to grow may yield a better understanding of how to move them forward. This involves coming at the analysis of African economies from a different angle which I believe will yield better results in developing policies for the economic development of African nations.

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## **Appendix**

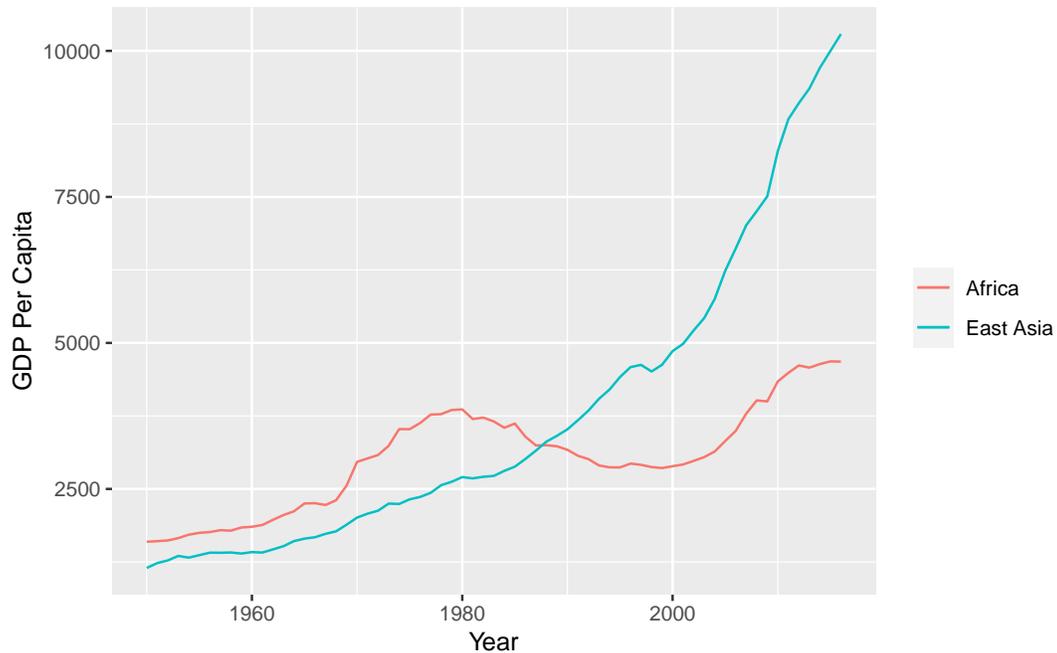
### **Figures**

### **Tables**

	<i>Dependent variable:</i>
	Log_GDP_Per_Capita
Log Exports Per Capita	0.140*** (0.027)
Log Terms of Trade	0.218*** (0.028)
Share of Agriculture in GDP	−0.104*** (0.007)
Log Railway Length Per Capita	0.010 (0.033)
Money Supply(M2)	0.000 (0.000)
Consumer Price Index	−0.00001 (0.0004)
Observations	693
R <sup>2</sup>	0.371
Adjusted R <sup>2</sup>	0.166
F Statistic	51.367*** (df = 6; 522)
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01

Table 2A.1: Regression results with more dependent variables

Figure 2A.1: Average Real GDP per Capita. Africa and East Asia



Data Source: World Development Indicators

Table 2A.2: Theories about the causes of economic decline in Africa

Theory and Author(s)	Brief Explanation of the Theory
The impact of the slave trade (Manning 1981; Inikori 1992; Gemery and Hedgehorn 1979; Nunn 2008)	This theory suggests that the massive depopulation of the slave trade led to a slowdown in Africa’s demographic transition ,human capital accumulation and long term economic growth.It also led to a reduction in welfare by reducing their production possibility frontier. It also encouraged ethnic fractionalization.

Theory and Author(s)	Brief Explanation of the Theory
Colonial Institutions/ the effects of colonialism (Acemoglu et al, 2001; Nunn, 2007)	The idea that the cause of weak institutions in Africa today stems from the institutions created by colonizers who often created extractive institutions and did not have the incentive to establish a strong rule of law. These weak institutions then cause long term economic decline through ethnic fragmentalization and sub optimal social policies.
Poor Quality of Governance (Rivera-Batiz, 2002)	In this paper, the quality of governance is used to test the effects of democracy on economic growth. The findings show that although democracy is important for economic growth, the quality of governance is more important as a country with an authoritarian regime with high quality of governance is more likely to have higher economic growth and performance than a democratic country with low quality of governance.
The impact of diseases (Bloom et al., 1998; Gallup and Sachs, 2001; Lorentzen et al, 2008)	This view is that the high incidence of diseases leads to economic decline by causing high mortality rates, higher fertility and lower investment in physical and human capital

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Theory and Author(s)	Brief Explanation of the Theory
Various factors (Artadi and Sala I Martin, 2003.)	This paper stipulates that expensive investment goods, low levels of education, poor health, adverse geography, closed economies, too much public expenditure and too many military conflicts are the cause of slow economic progress in Africa.

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## Data sources

All population data is from Maddison (2010) and is updated using data from the World Bank database (2017). Data on exports quantities in real terms and terms of trade is collected from different sources for the seven Latin American countries used. For Argentina, total exports in nominal terms is divided by price of exports for the years 1810 to 2009 in order to get real export quantities. This data is collected from Ferreres (2010) and divided by population data from Maddison (2010) to get real export quantities per capita. Maddison's population data is only available up till 2014 so it is spliced with population data from the World Bank databank (2017). Argentina's export quantities per capita is updated to 2015 using exports quantities index data from The Latin American Economic History Database Montevideo-Oxford (MOxLAD) by Bértola and Rey (2018).

For Chile, exports quantity index is collected for the years 1810- 1995 from Braun-Llona et al, (1998) and spliced with exports volume index from the UNCTAD TRAINS database (2017). Population is from Maddison (2010) spliced with data from the World Bank(2017) database. Braun-Llona et al (1998) also provide exports quantity per capita for Mexico and Peru. For Mexico, the data is available from 1877 to 1995 and is spliced with export quantity from the UNCTAD TRAINS database (2017) and with exports volume data from MOxLAD. Peru's export quantity index is available from 1830 -1995 and is updated from 1995-2015 by splicing data on exports volume from the UNCTAD TRAINS database.

Brasil exports quantity data is available from 1825 - 1855 from Brazil. IPEA data (2009). This data is updated using export quantity index from *Históricas do Brasil*, I. E. (1990) for the years 1850 – 1979. This is then updated with export quantity index from MOxLAD for the years 1980-2010 and finally completed using export volume index from the UNCTAD TRAINS database (2017). Nominal exports are divided by export prices for the years 1830 – 1968 for Venezuela with data from Baptista, A. (2006). This data is then updated with export volume index for the years 1869-2010 from the UNCTAD

TRAINS database (2017) and completed using export volume index from the WTO merchandise trade indices annual dataset from 2011-2015.

Export quantity index from MOxLAD for the years 1900-2010 is updated to 2015 using data from the UNCTAD TRAINS database (2017) for Colombia. The average of export quantities per capita for the two countries for which data is available from 1810: Argentina and Chile is then used to backdate the remaining 5 countries to 1810.

Data on the share of agriculture in GDP for Argentina is from Ferreres (2010) for the years 1875-2009 and is updated using data from the world bank databank. For Brasil, the data is available from 1908 – 2005, for Chile it is available from 1940 – 2004 and for Colombia from 1925-2004 all from Buera and Kabowski(2012). They are all updated with world bank data. This data is updated upwards to 1860 for Chile using data from Braun-Llona et al, (1998). Data on share of agriculture in GDP is collected for Mexico for the years 1800 – 1921 from Lopex et al (2005) and updated to 2009 using the percentage of people employed in agriculture from Mitchell, (1992) and then completed using world bank data. For Peru, the data is available from 1810 – 2012 from Seminario, B. (2016) and for venezuela it is available for 1830 – 1961 from Baptista, A. (2006). Both are updated using world bank data. However, the world bank data only goes to 2014 for Venezuela so the same share of agriculture in gdp is assumed for 2014-2016.

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### 3 Chapter 3: The Effect of Trade Openness on Self-employment

**Abstract:**

This chapter analyses the effect of trade openness on the rate of self-employment and reveals that the impact of trade openness on self-employment depends on the degree of labour market rigidity in a country. Countries with more flexible labour market regulations are better primed to benefit from trade openness through an increase in manufacturing sector employment and a reduction in the level of self-employment. There is a particular emphasis on African countries as self-employment is notoriously high in these countries, while economic growth and development are painfully slow. Two African countries with different degrees of labour market rigidity are analysed to test the robustness of the results. In South Africa, where labour market regulations are more rigid and effectively enforced, the relationship between trade openness and self-employment is positive. In contrast, in Ghana, where labour market regulations are more flexible, the relationship between trade openness and self-employment is negative. The policy discussion concerning the rate of self-employment in Africa may need to be taken in a different direction. Instead of reducing self-employment and seeing it as a failure of the labour market, the focus should be how to make the self-employment sector more efficient at transferring economic growth to the working population through increasing wages in the self-employment sector.

**JEL:** F16; F66 **Key Words:** Trade liberalisation; Structural change

### 3.1 Introduction

In developed countries, self-employment is on the lower end, is possibly voluntary and a form of entrepreneurship. However, in developing countries, self-employment is high, pervasive and likely as a result of unemployment push factors (i.e. people in the labour market are likely “pushed” into self-employment because of unemployment). This chapter explores the effect of international trade on the rate of self-employment. Over the last few decades, global trade has grown substantially as trade as a percentage of GDP is generally rising and trade is viewed as an essential factor for economic growth and development (Feder, 1983; Winters, 2004). Therefore, understanding how trade influences labour market outcomes is necessary. The labour market is a fundamental channel through which economic growth affects people and living standards in a country.

Trade openness measures the proportion of trade (import and export of goods and services) in the GDP of any given country. According to the World Trade Organisation (2018), world merchandise exports were up to US\$17.73 trillion and world commercial services exports were up to US\$5.28 trillion in 2017. Openness to trade is often recommended as an integral part of economic growth and development for any country. Firstly because of the theory of comparative advantage, which is, in a sense, intuitive and is widely accepted by economists. It is a model that makes many assumptions but has results that are easy to understand. It shows that economies can experience growth by opening up to trade as a result of comparative advantage in different goods and services and through the benefits of specialisation. (Heckscher and Ohlin, 1991; Frankel and Romer, 1999) Studies have found positive impacts of international trade on economic growth in different countries, either by evaluating the impact of international trade on economic growth in individual countries or by evaluating cross country growth differences despite international trade (Balassa, 1983; Frankel & Romer, 1999; Brueckner & Lederman, 2015). In addition, some studies have found that export growth can positively affect the rate of economic growth in less developed countries(LDC’s) (Fosu, 1990).

Trade should improve economies, but developing countries are usually either not improving or growing quite slowly.

Self-employed workers fall into the categories of own-account workers, members of productive cooperative and contributing family workers. The remuneration of these workers depends directly on the profits earned from production. The self-employment rate is the share of these workers in an economy. (World Bank, 2019). Caceres and Caceres (2017) find that self-employment is a means of subsistence in response to unemployment and economic stagnation using simple regression analysis on data for 18 Latin American countries. They also show a positive association between self-employment and poverty gap, indicating that as self-employment increases, so does the rate of poverty.

This chapter adds to the existing literature on the effect of trade openness on labour force outcomes by showing that the impact of trade openness on self-employment in a country depends on the labour market frictions that exist. By itself, trade openness does not significantly impact self-employment. However, when the degree of labour market rigidity is considered, the effect of trade openness on self-employment can be observed. There has not been much research on the relationship between trade openness and self-employment. However, the empirical work that has been done in this area produces different results depending on the country, the sector or industry considered and the definition of trade openness used.

This study considers the self-employment rate, specifically for various reasons. Firstly, analysing the rate of employment as a proxy for labour market outcomes would likely only involve the formal economy and mostly the manufacturing sector. This does not reveal the actual state of the labour market, especially in developing countries. In addition, just including informal employment to the analysis of the labour market does not solve the problem as it is classified differently in different countries. Self-employment is more indicative of labour market inefficiencies in developing countries.

In trying to understand the effect of trade openness on self-employment, it is vital to acknowledge the role that the rigidity of labour markets in a country

play. The degree of labour market rigidity or flexibility in a country will influence how trade openness impacts self-employment in a country. A rigid labour market refers to one in which the response of an employer to a possible change in circumstances is limited (Solow, 1997). Therefore, any barriers that hinder the frictionless match between employers and employees seeking labourers make a labour market more rigid.

Therefore, this chapter will study the effect of trade openness on the rate of self-employment in 164 countries and add labour market rigidity to the regression using data from Campos and Nugent(2012). They developed an index of labour market rigidity across countries and over time using employment laws and the historical origin of those laws. It is especially important to understand this relationship for African countries where self-employment is very high, growth and development quite inferior to the rest of the world. However, trade is just as open as most countries in the world. Why is self-employment in African countries still such a substantial proportion of total employment when the proportion of trade in GDP is considerable?

In this chapter, the analysis shows that trade openness does not have a unilateral impact on self-employment. However, when trade openness interacts with labour market rigidity, it significantly affects the rate of self-employment in a country. I explore this relationship using African data and find the same results. I then study two African countries with different degrees of labour market friction and find support for our results. In South Africa where labour market regulations are more rigid, trade openness has a positive effect of self-employment as both variables move in the same direction while in Ghana where labour market regulations are more flexible, trade openness and self-employment move in different directions and therefore have a negative relationship.

Economic outcomes for African countries are baffling. Sub Saharan Africa is home to the poorest people in the world and Nigeria; the most populated African country recently surpassed India as home to the largest population of poor people in the world. (CNN, 2018) The need to understand how African

economies grow and develop is imperative. It is important to understand the role that trade plays in labour market outcomes in Africa as this will inform poverty reduction strategies and policy formation in these countries. The trade liberalisation reforms in the Cashew market in Mozambique failed to yield the expected positive impact on their economy that the World Bank expected when they pressured the country into it. This was mainly due to their lack of understanding of the cashew market structure in Mozambique (McMillan et al., 2002). Trade openness is often prescribed as necessary for economic growth, but it is crucial to understand the mechanisms through which it can improve economic performance in African countries.

### **3.2 Literature**

There have been attempts to understand how trade affects labour market outcomes in different countries. Most papers in this area focus on how trade influences the distribution of employment between the informal and formal sector (see Goldberg and Pavcnik, 2003; Paz, 2014; Arias et al., 2018; Marjit and Maiti, 2005). Although most self-employed works exist in the informal sector, not all workers in the informal sector are self-employed workers. While there is an apparent strong positive relationship between self-employment and informality, there is something unique about self-employment, especially in developing countries and in Africa.

Self-employment differs from employment in the informal sector as the informal sector captures a broader scope of the labour force. Data on the self-employment rate is better for cross-country comparison than data on the informal economy. The definition of the informal economy in different countries depends on their labour laws according to McCaig and Pavcnik, (2018). The informal economy includes all economic activity outside of official institutions. McCaig and Pavcnik, (2018) demarcate firms in the informal economy of the Vietnamese manufacturing sector from those in the formal based on the registration status of the firm. They use the distinction between registering as a household business or a formal enterprise under the Vietnamese enterprise

law as a guide to know which firms are in the formal or informal sector. Porta and Shleifer (2008) explain that firms in the informal sector are those that are not registered with the government and use the extent of tax evasion by firms in the formal sector to estimate the size of the informal sector. They also try to infer the size of the informal economy by using the self-employment rate. However, these laws will differ across countries, and as such, there is no reliable definition of the informal sector for all countries.

The self-employment rate is measured as the percentage of own-account workers, members of productive cooperatives and family workers in total employment in a country. The worker's remuneration is one of the main criterion used to differentiate self-employed workers from paid employed workers, according to the International Labour Organisation (ILO). The remuneration of self-employed workers depends directly on the expectation of the business making profits. At least some part of the remuneration of employed workers is independent of profits made. Self-reporting surveys are used to estimate the proportion of workers who are self-employed in total employment. Not enough research has been done into how trade openness affects self-employment. When analysing the effect of international trade on labour market outcomes, most papers focus on not just the informal sector but also how trade and labour market regulations affect labour demand with the emphasis usually on the manufacturing industry.

Hasan (2001) presents an analysis of the relationship between trade openness and labour market regulations on employment and wages in the manufacturing sector in 48 developing countries. Using a simple panel regression to estimate the relationship, this chapter finds adverse changes to employment and wages directly after trade liberalisation. However, both variables recover soon after with wages possibly rising higher than before trade liberalisation. He also finds that with more rigid labour market regulation, real wages are higher, although this is at the expense of employment. Similarly, the Helpman and Itskhoki (2010) model (This model is explained in the next section) shows that when labour market rigidity is high, international trade can cause unemployment.

These results are interesting as they show the unintended effect of trade liberalisation and rigid labour market regulations on wages and employment in developing countries.

In Cameroon, Njikam (2016) uses a difference-in-difference approach and find that there was a 9.5% increase in the demand for unskilled labour in the manufacturing sector due to the labour market and trade reforms that occurred in Cameroon in 1992 and 1993 respectively. They compared firms that were exposed to reforms and those that were not, pre and post reforms to observe the effect of the reforms on labour demand. This finding is in line with his expectation of increased demand for unskilled labour in a country that is unskilled labour intensive like Cameroon. The Heckscher Ohlin model predicts that trade benefits abundant factors of production.

In addition, Popli (2010) studied Mexico from 1984-2002, where there was rapid trade liberalisation in the country and analysed its effect on the incomes of self-employed workers and wage earners. This liberalisation they thought will lead to an increase in the demand for and the benefit of unskilled labour. However, observing the labour force outcomes during and after the period, she finds that there was increased demand and return to skilled labour; therefore trade liberalisation led to unexpected income inequality and higher levels of self-employment. Also, Mcmillan et al. (2002) show that not only did trade liberalisation not have the expected magnitude of improvement on Mozambique's economy, it also led to an increase in unemployment in Mozambique. They estimate a total loss of up to 8091 jobs and efficiency loss of up to 6.07 million US\$. The reform did not consider market imperfections.

Other papers focus solely on the direct effect of trade on employment and self-employment in manufacturing. Diez and Ozdakali (2011) find that economies and sectors more exposed to foreign competition have lower rates of self-employment and use a model to rationalise this relationship. They use data on 38 European countries and the US manufacturing sector and find two mechanisms driving the negative relationship between trade openness and self-employment. First, as a result of foreign competition and increased labour

demand by exporting firms, domestic real wages increase, and this, in turn, increases the opportunity cost of remaining self-employed. At the same time, higher real wages decrease the profits of non-exporting firms and reallocates resources towards the more productive firms.

Furthermore, McCaig and Pavcnik (2018) show that the movement of Vietnam from a high tariff regime to a low one by the United States in 2011 significantly impacted the reallocation of labour from less productive informal sectors to more productive ones. While in Mauritius, Milner and Wright (1998) show that international trade can lead to increased employment in both import-competing and export-competing firms in the short and long run. On the other hand, Acosta and Montes-Rojas (2014) find that trade liberalisation accounted for a third of the rise in informality in Argentina between 1993 and 2003. They use industry-level data and find evidence to support the hypothesis that openness to trade can increase job informality as firms try to compete internationally.

### **3.3 Theoretical Background**

The model by Helpman and Itskhoki (2010) explains the labour market distributional effects of trade in open economies. Opening up to trade has effects on the sectoral distribution of labour and unemployment. They develop a model of international trade between two countries with varying degrees of labour market frictions and two production sectors, a homogenous goods sector and a differentiated goods sector. The differentiated goods sector exhibits firm heterogeneity and monopolistic competition while the homogenous goods sector is the rest of the economy. Labour market regulations are more important in the differentiated goods sector than in the homogenous goods sector. For our analysis, the differentiated goods sector can be thought of as other economic activity outside of the self-employed sector while the homogenous goods sector is self-employment. The self-employment sector is usually less regulated and more informal in most economies, while labour market regulations are more important for formal sectors like manufacturing and industry. In developing

countries, most of the self-employed workers are in the Agriculture and primary goods sector (Fields, 2019). Helpman and Itskhoki (2010) show that both countries gain from trade with regards to total factor productivity regardless of the degree of labour market friction in each country. However, in their model, lowering labour market frictions can give a country competitive advantage in the differentiated sector that is similar but not identical to a rise in productivity. Therefore, countries with less friction in their labour markets enjoy a greater welfare gain from international trade. In comparison, countries with more friction in their labour markets attract fewer firms to their differentiated goods sector.

However, this has effects on the level of self-employment or employment in the homogenous sector. Because countries with more flexible labour market regulations attract more firms into the heterogeneous sector as trade opens up, workers move towards this sector from the homogenous sector to enjoy the windfall of the increase in production as the demand for labour also rises as production increases. Therefore self-employment will fall as trade opens up in a country with flexible labour market regulations. On the other hand, because countries with more rigid labour market regulations attract fewer firms into the heterogeneous sector as trade opens up, labour moves from the heterogeneous sector towards the homogenous sector and self-employment rises with trade openness.

Their results imply that the impact of trade openness on employment in the differentiated goods sector and the homogenous depends on the level of labour market frictions. When the labour market regulations are more flexible, trade openness reduces self-employment. It increases employment in the differentiated goods sector. In contrast, employment in the homogenous goods sector or self-employment rises when trade opens up in a country where labour market regulations are more rigid. The Helpman and Itskhoki model and assumptions is presented in more detail in the appendix. In the next section, we test how international trade affects labour market outcomes depending on the varying degree of labour market rigidity or flexibility in a country and find that the

data supports Hempman and Itskhoki (2010).

## **3.4 Data and Graphical Evidence**

In this section, the summary of the data used is presented in tables and graphs.

### **3.4.1 Data**

To explore how trade openness affects self-employment depending on the degree of labour market rigidity of a country, this chapter collects data on trade openness, labour market rigidity, self-employment and other control variables for 164 countries between 1980 and 2004. The sample size is dictated by data availability. (See Appendix for the list of countries).

Trade openness measures the extent to which a country trades. It is calculated as exports plus imports of goods and services divided by GDP. This is a basic measure of trade openness in a country as it is simply the share of trade in national income. Data on trade openness is from the World Bank's World Development Indicators. Trade openness can also be measured in terms of the restrictiveness to international trade of a country. Some papers use the average tariff rates as a measure of trade openness in a country, so a country with lower average tariff and non-tariff barriers to trade is considered more open to trade (see Sachs and Warner (1995); Goldberg and Pavcnik, 2007; Knight et al., (1993)).

The self-employment rate is the number of self-employed workers as a percentage of the working population in a country. This information is harmonised using surveys that determine what kind of work a person does. The three categories for self-employment include; own account workers, members of productive cooperatives and contributing family workers. The surveys are used to determine which category a worker falls into, and all workers in these three categories are aggregated to form the self-employment sector of a country. The self-employment rate data is collected from the World Bank's world develop-

ment indicators which uses survey data from the ILO to create standardised information on it. Labour market rigidity data is from Campos and Nugent (2012). They construct an index of labour market rigidity for up to 145 countries using labour laws and legal origins (leftist or more socialist political approach). They start with the index of labour market rigidity created by Botero et al., (2004) for 85 countries and use labour law records and provisions from the ILO to aggregate the individual components of labour laws in various countries into one employment law index. They also compare their index to other measures of labour market rigidity and make use of individual country studies to provide quantitative and qualitative assessments of employment protection legislation and changes over time. The index of labour market rigidity constructed by Botero et al. (2004) uses data on employment, collective relations and social security laws for the year 1997 to construct a new dataset on labour regulations that captures the different dimensions of labour laws in a country. They analyse the formal legal statutes on employment laws in each country in conjunction with the legal origins of the country and categorise them into indices with the legal protection of workers and therefore labour market rigidity increasing as the index figure gets larger and vice versa.

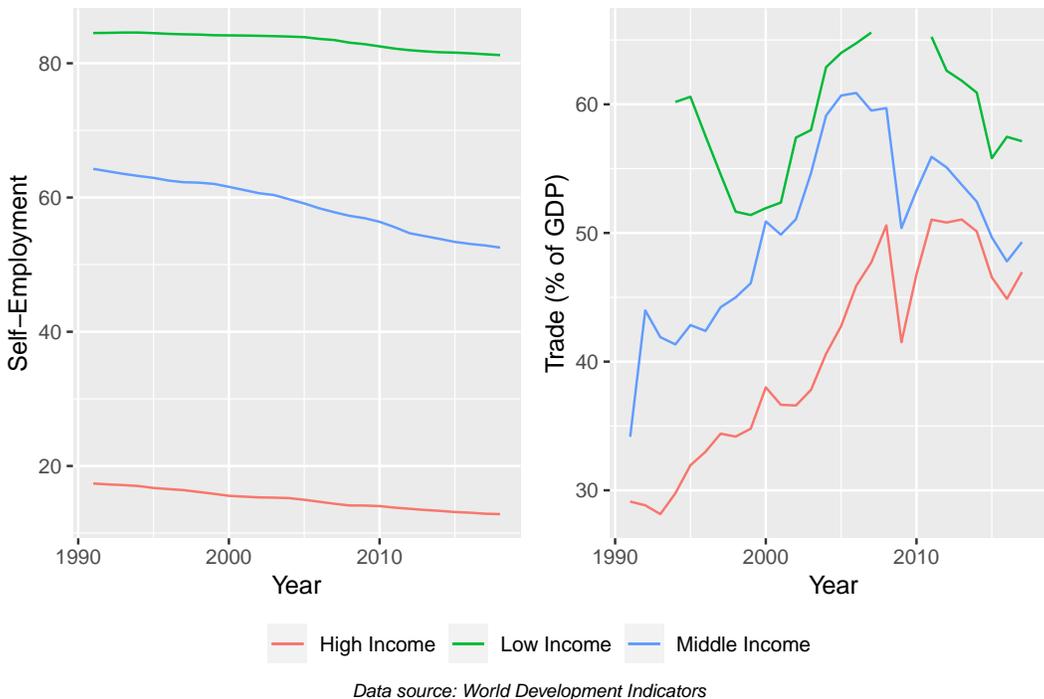
Employment in manufacturing refers to the percentage of employed workers who work in industry. Industry includes manufacturing, public utilities, quarrying and mining. All persons of working age involved in these activities for pay are considered as being employed in industry. While the services sector refers to wholesale and retail trade, restaurants and hotels, communication services financial insurance and other such activities. The ILO classes workers based on their economic activities using the International Standard Industrial Classification (ISIC) and it is based on which sector the work is performed.

Control variables include GDP per capita, domestic credit to the private sector, real interest rate, the rate of inflation and institutional quality. The data for these variables are all from the World Bank's world development indicators except for institutional quality which is from the International Country Risk Guide (ICRG) by the PRS group. GDP per capita calculates the gross

domestic value-added of production in an economy divided by the mid-year population. It is important to control for this variable as it will surely affect the rate of self-employment in a country. As can be seen in figure 3.1, higher-income countries have lower rates of self-employment and vice versa.

Meanwhile, domestic credit to the private sector refers to all the financial resources provided by any financial corporations to private institutions in an economy as a percentage of the economy's GDP. This variable shows the level of development of the financial market of a country and private firm's access to financial resources. The data is collected from the World Bank who create it using information from the IMF's International Financial Statistics (IFS) who collect data on the banking sector of most countries of the world. More access to financial credit services may lead to less self-employment likely because credit is needed to start-up and maintain firms (Menon and Rodgers, 2013).

Figure 3.1: Self-Employment and International trade in High, Middle and Low income countries



The real interest rate is the deposit and lending rate adjusted for inflation.

Variable	Obs	Mean	Std.Dev.	Min	Median	Max
Self-Employment	486	45.983	28.717	1.157	42.851	94.881
Trade Openness	690	73.626	46.846	0.658	62.166	372.487
Labour Market Rigidity	672	1.579	0.492	0.065	1.650	3.500
Employment in Manufacturing	486	19.935	9.378	1.787	21.274	43.891
Employment in Services	486	46.351	18.589	5.479	48.262	84.261
Unemployment rate	486	7.948	5.919	0.377	6.669	37.224
Log GDP per capita	728	3.524	0.676	2.177	3.489	4.994
Domestic Credit to the private sector	635	33.702	33.706	0.186	22.164	208.735
Interest Rate	379	6.424	23.085	-87.447	6.452	351.738
Log CPI	649	2.079	0.170	1.973	2.031	3.541

Table 3.1: Summary Statistics

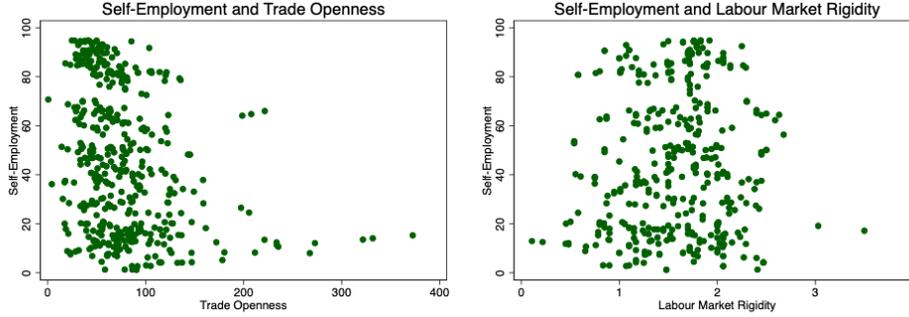
Data on nominal rates are from the IMF, and the GDP deflator used is from the World Bank. The consumer price index is calculated using Laspeyere's formula. It represents the general changes to the average cost of acquiring a set basket of goods and services by a household. Laspeyres index is calculated with a base year as a reference and the difference in the price of the same basket goods and services in the base year from any year is the inflation rate in that year.

Table 3.1 presents the summary statistics of these variables. The median of labour market rigidity will be used to determine whether a country has a flexible or rigid labour market as the degree of labour market rigidity increases with the index.

### 3.4.2 Graphical evidence

Figure 3.2 shows the scatter plot of self-employment and trade openness and self-employment and labour market rigidity all in five-year averages. The graphs do not show a clear pattern of the relationship between trade openness and labour market rigidity on self-employment. The figures, however, generally show that as trade openness increases, the self-employment rate is falling and the more flexible labour market regulations are, the lower the self-employment rate.

FIGURE 3.2: Trade Openness, Labour Market Rigidity and Self-Employment



### 3.5 Model Specification and Estimation method

The model specification is presented below.

$$se_{it} = \alpha_{it} + \beta_{it}to + \alpha_3lmr_{it} + \gamma_i lmr * to + \delta_{it}X + \lambda_i + \phi_t + \epsilon_{it}$$

Where  $se$  refers to self - employment rate,  $to$  is trade openness,  $lmr$  is labour market rigidity, and  $lmr * to$  is the interaction between trade openness and labour market rigidity.  $X$  captures the control variables such as GDP per capita, domestic credit to the private sector, interest rate, inflation and institutional quality.  $\lambda_i$  is the time-invariant country fixed effects,  $\phi_t$  is the time fixed effect and  $\epsilon_{it}$  is the country-specific, time-varying error term.

The theoretical predictions of Helpman and Itskhoki (2010) are that the  $\gamma$  term should be positive. In their model, self-employment is rising in a country with more rigid labour market regulations when they open up to trade. This is because the rigidity of the labour market makes production expansion more costly and discourages firms from entering into the heterogeneous sector. Therefore, as trade opens up, workers move towards the self-employed sector. I include this interaction term because there is no clear relationship between trade openness and self-employment. As will be shown in the results in the next section, without adding this interaction term, the effect of trade openness on self-employment is statistically insignificant.

To explore the effect of trade openness and labour market rigidity on self-employment, this chapter employs a fixed-effects panel regression with clustered standard errors for data from 1980 – 2004. Standard errors are clustered on the country level because there are large cross country differences that are difficult to control for and may hinder proper understanding of the effect of trade openness and labour market rigidity on self-employment. The data is aggregated into five-year averages to observe the long-run effects.

## **3.6 Results**

This chapter tests the effect of trade openness on self-employment as the benchmark model. It then uses the employment in manufacturing and services as the dependent variable to further understand how international trade affects employment outcomes. Endogeneity issues are addressed by lagging the data on trade openness by one period and using that as an instrument in the panel regression for self-employment, employment in manufacturing and services, a period here being five years. All panel regression in this chapter is done using fixed effects estimation and clustered standard errors for reasons already stated. Country and period fixed effects are controlled for. These results are presented in the next few subsections.

### **3.6.1 Benchmark results**

Table 3.2 shows the relationship between trade openness, labour market rigidity and self-employment. Column 1 presents the effect of trade openness on self-employment when labour market rigidity and the interaction of labour market rigidity and trade openness is controlled for and column 2 presents the direct effect of trade openness on self-employment with important macroeconomic variables controlled. Column 2 shows that trade openness by itself does not have a significant impact on self-employment. However, when labour market rigidity and the interaction of labour market rigidity and trade openness is added to the regression, trade openness has a statistically significant

and negative effect on self-employment. As a country opens up to trade, the self-employment rate falls. This may signify that the effect of opening up to trade on self-employment outcomes depends on the degree of labour market rigidity in a country.

In the third column, standard macroeconomic variables are added to the regression in column 1 and controlled for. These variables: log GDP per capita and domestic credit to the private sector are important variables to control for when trying to understand the self-employment rate in a country. Acs et al. (1994) find that the stage of economic development, which can be captured using GDP per capita can explain the cross country differences in the self-employment rate over time.

When control variables are added to the regression, there is a significant positive relationship between the interaction of trade openness and labour market rigidity on self-employment. This could signify that when a country with a more rigid labour market opens up to trade, the rate of self – employment rises and vice versa. Countries with rigid labour markets will gain from trade when they open up to trade; however, workers may move into self-employment because labour market rigidity increases the difficulty in finding a job. This is in line with the theory by Helpman and Itskhoki (2010). They show that when a country with a more rigid labour market trades with a country with a more flexible labour market, resources flow out of the formal heterogeneous goods sector towards the homogenous goods sector which is similar to self-employment in this case.

Interest rate and inflation rate are added to the regression in the fourth column, and institutional quality is accounted for in the fifth column. These variables are statistically insignificant in the regression, but standard economic models find a link between inflation and employment in the Philips curve (Fuhrer 1995). This is represented in the positive relationship between inflation and self-employment if self-employment is viewed as a form of employment.

		Self-Employment				
		se_ilo2019				
	(1)	(2)	(3)	(4)	(5)	
Trade Openness (TO)	-0.022** (0.011)	-0.002 (0.015)	-0.023* (0.012)	-0.015 (0.017)	-0.014 (0.019)	
Labour Market Rigidity (LMR)	-0.194 (0.430)		-0.320 (0.389)	-0.598 (0.435)	-0.717 (0.448)	
TO*LMR	0.004 (0.003)		0.007*** (0.003)	0.008*** (0.003)	0.008** (0.003)	
Log GDP per capita		-12.590*** (4.673)	-6.272** (2.849)	-10.184*** (3.663)	-12.826** (4.983)	
Credit to the Private Sector		0.005 (0.015)	0.002 (0.009)	0.007 (0.016)	0.008 (0.017)	
Interest Rate		0.006 (0.016)		0.003 (0.011)	0.006 (0.015)	
Log Inflation		0.518 (1.630)		0.260 (0.981)	0.100 (1.746)	
Institutional Quality		0.036 (0.037)			0.031 (0.046)	
Observations	369	185	322	193	168	
R <sup>2</sup>	0.018	0.114	0.056	0.116	0.118	
Adjusted R <sup>2</sup>	-0.621	-0.630	-0.656	-0.681	-0.693	
F Statistic	1.332 (df = 3; 223)	2.144* (df = 6; 100)	2.176* (df = 5; 183)	1.889* (df = 7; 101)	1.452 (df = 8; 87)	

Note: \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table 3.2: Trade openness, labour market rigidity vs self-employment rate.

### 3.6.2 Trade Openness and employment in the manufacturing and service sectors

In table 3.3, the share of employment in the manufacturing sector is the dependent variable, and the same independent regressors as in table 3.2 are considered. According to these results, trade openness in itself does not have a statistically significant effect on the manufacturing sector employment rate. However, when a country with a more rigid labour market opens up, the share of employment in manufacturing falls, and this effect is statistically significant. This indicates that more labour market regulations may have the unintentional effect of increasing unemployment in manufacturing when a country opens up to trade but just opening up to trade in itself, regardless of the degree of labour market rigidity increases employment in the manufacturing sector. The Heckscher-Ohlin theory shows that when countries trade, productivity and employment rises in the traded goods sector (Heckscher and Ohlin, 1991). Trade usually occurs in the manufacturing sector, so that may explain this result. Real interest rate is statistically significant in column 5 and shows a positive relationship with the rate of employment in the manufacturing sector. This may be due to the effect of rising inflation which is used to calculate the real interest rate from nominal levels. As the GDP deflator is falling, if nominal interest rates stay the same, the rate of employment in manufacturing is rising. The Philips curve shows that there is a positive relationship between inflation and employment and this result is in support.

I then test trade openness on the rate of employment in the services sector, and the results are shown in Table 3.4. In column 2, trade openness has a positive and statistically significant effect on self-employment. Also, labour market rigidity has a strong positive effect on the share of employment in the service sector. The more rigid the labour market, the higher the rate of employment in services. The services sector is usually more focused on providing services for domestic consumption and may have a lower cost of entry. So as the rigidity of the labour market prevents workers from going into manufacturing, they may move towards services. In the other columns, none of the explanatory vari-

Manufacturing Sector Employment					
	(1)	(2)	(3)	(4)	(5)
			mfgemp		
Trade Openness (TO)	0.013 (0.020)	-0.017 (0.013)	0.027*** (0.010)	0.024* (0.014)	0.024 (0.016)
Labour Market Rigidity (LMR)	0.874		0.803** (0.402)	0.818 (0.521)	0.731 (0.522)
TO*LMR	-0.012		-0.015*** (0.003)	-0.014*** (0.004)	-0.013*** (0.004)
Log GDP per capita		3.484	3.437* (2.054)	2.488 (2.482)	1.886 (3.542)
Credit to the Private Sector		-0.004	-0.013 (0.011)	-0.005 (0.015)	-0.002 (0.016)
Interest Rate		0.016		0.028 (0.017)	0.028* (0.016)
Log Inflation		1.451		1.579 (1.478)	1.263 (1.911)
Institutional Quality		0.001			0.033 (0.030)
Observations	369	185	322	193	168
R <sup>2</sup>	0.030	0.024	0.068	0.125	0.132
Adjusted R <sup>2</sup>	-0.601	-0.796	-0.634	-0.663	-0.667
F Statistic	2.276* (df = 3; 223)	0.410 (df = 6; 100)	2.688** (df = 5; 183)	2.068* (df = 7; 101)	1.648 (df = 8; 87)

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table 3.3: Trade openness, labour market rigidity vs employment in the manufacturing sector.

Service Sector Employment					
	(1)	(2)	(3)	(4)	(5)
	srvemp				
Trade Openness (TO)	0.014 (0.014)	0.032* (0.018)	0.008 (0.014)	0.010 (0.020)	0.002 (0.023)
Labour Market Rigidity (LMR)	-0.551 (0.467)		-0.065 (0.421)	-0.545 (0.532)	-0.278 (0.518)
TO*LMR	0.005 (0.004)		0.003 (0.004)	0.005 (0.003)	0.004 (0.003)
Log GDP per capita		11.878*** (3.297)	14.085*** (3.047)	12.940*** (3.645)	15.330*** (4.769)
Credit to the Private Sector		-0.013 (0.019)	0.001 (0.015)	-0.014 (0.022)	-0.021 (0.021)
Interest Rate		-0.032 (0.027)		-0.039 (0.028)	-0.055** (0.026)
Log Inflation		-1.458 (2.458)		-2.022 (2.601)	0.758 (3.488)
Institutional Quality					0.0004 (0.047)
Observations	369	220	322	193	168
R <sup>2</sup>	0.027	0.167	0.149	0.192	0.181
Adjusted R <sup>2</sup>	-0.605	-0.508	-0.493	-0.537	-0.572
F Statistic	2.098 (df = 3; 223)	4.838*** (df = 5; 121)	6.404*** (df = 5; 183)	3.421*** (df = 7; 101)	2.405** (df = 8; 87)

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table 3.4: Trade openness, labour market rigidity vs employment in the services sector.

ables is statistically significant, except GDP per capita. The services sector in any economy is likely to have production that is a combination of internationally tradeable and untradeable goods as opposed to the manufacturing sector where most of the production can be traded internationally. This may explain why trade openness and the interaction of trade openness and labour market rigidity are not statistically significant in this regression, but trade openness by itself is significant.

### **3.6.3 Lag trade openness**

Tables 3.5 – 3.7 show the results of the effect of trade openness on self-employment, employment in manufacturing and services when trade openness is lagged by one period (5 years). This is because trade openness may have a delayed impact on labour market outcomes since labour markets take time to adjust to trade openness (Dix-Carneiro, 2014). Also, lagged trade openness can partially account for the endogeneity issues that arise from testing trade openness on self-employment. This makes it a robustness check of the results.

In table 3.5, the self-employment rate is the dependent variable, and the direct effect of lagged values of trade openness on self-employment is negative and statistically significant. This relationship stays the same even when the labour market rigidity and the interaction of trade openness and labour market rigidity are added to the regression. An increase in trade openness in one period can reduce the self-employment rate in the next period by up to 1 percentage point (self-employment rate is in percentages). For the interaction between labour market rigidity and lagged values of trade openness, there is a positive relationship with the self-employment rate showing that trade openness in a country with more rigid labour market regulations in one period should increase self-employment in the next.

The lagged values of trade openness increases the rate of employment in manufacturing and is statistically significant in the regression results shown in table 3.6. The variable of interest, which is the interaction term has a negative and statistically significant relationship with employment in manufacturing. Trade

openness with a more rigid labour market can reduce the rate of employment in manufacturing in the long term.

Other than in column 3, lag trade openness has a positive and statistically significant relationship with employment in services in Table 3.7. This implies that the effect of trade openness on the services sector is to increase employment in services in the next period.

		Self Employment				
		se_ilo2019				
		(1)	(2)	(3)	(4)	(5)
Lag Trade Openness (Lag TO)		-0.022** (0.011)	-0.015* (0.009)	-0.024* (0.013)	-0.010 (0.012)	-0.013 (0.015)
Labour Market Rigidity (LMR)		-0.065 (0.236)		0.076 (0.240)	0.124 (0.263)	0.089 (0.271)
Lag TO*LMR		0.004* (0.002)		0.006*** (0.002)	0.005** (0.003)	0.004 (0.003)
Log GDP per capita			-11.022*** (3.157)	-6.803** (3.429)	-10.191** (3.995)	-10.885** (5.021)
Credit to the Private Sector			0.014 (0.010)	0.010 (0.008)	0.014 (0.012)	0.013 (0.014)
Interest Rate			-0.002 (0.011)		-0.002 (0.012)	-0.005 (0.015)
Log Inflation			0.359 (0.718)		0.002 (0.753)	0.646 (1.599)
Institutional Quality						0.027 (0.032)
Observations		333	210	298	178	158
R <sup>2</sup>		0.029	0.170	0.085	0.151	0.145
Adjusted R <sup>2</sup>		-0.697	-0.522	-0.688	-0.689	-0.678
F Statistic		1.866 (df = 3, 190)	4.655*** (df = 5; 114)	2.988** (df = 5; 161)	2.254** (df = 7; 89)	1.699 (df = 8; 80)

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table 3.5 Lag Trade openness , labour market rigidity vs self-employment rate

Manufacturing Sector Employment					
	(1)	(2)	(3)	(4)	(5)
			mfgemp		
Lag Trade Openness (Lag TO)	0.024** (0.009)	0.007 (0.011)	0.033*** (0.009)	0.019 (0.013)	0.026* (0.015)
Labour Market Rigidity (LMR)	0.157 (0.237)		-0.031 (0.233)	-0.232 (0.316)	-0.233 (0.295)
Lag TO*LMR	-0.005 (0.004)		-0.007** (0.004)	-0.007** (0.004)	-0.007 (0.004)
Log GDP per capita		2.660 (2.506)	3.539 (2.527)	1.164 (3.006)	1.299 (3.813)
Credit to the Private Sector		-0.009 (0.014)	-0.017 (0.012)	-0.009 (0.016)	-0.007 (0.017)
Interest Rate		0.018 (0.018)		0.026 (0.020)	0.026 (0.018)
Log Inflation		1.163 (1.632)		2.176 (1.816)	1.775 (2.358)
Institutional Quality					0.033 (0.030)
Observations	333	210	298	178	158
R <sup>2</sup>	0.031	0.018	0.085	0.118	0.131
Adjusted R <sup>2</sup>	-0.694	-0.801	-0.689	-0.754	-0.704
F Statistic	2.003 (df = 3; 190)	0.412 (df = 5; 114)	2.977** (df = 5; 161)	1.703 (df = 7; 89)	1.514 (df = 8; 80)

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table 3.6 : Lag Trade openness, labour market rigidity vs employment in the manufacturing sector.

Service Sector Employment					
	(1)	(2)	(3)	(4)	(5)
	srvemp				
Lag Trade Openness (Lag TO)	0.020* (0.012)	0.041*** (0.014)	0.016 (0.013)	0.038** (0.018)	0.039* (0.021)
Labour Market Rigidity (LMR)	-0.073 (0.305)		0.155 (0.311)	0.135 (0.376)	0.376 (0.392)
Lag TO*LMR	0.003 (0.003)		0.004 (0.002)	0.004 (0.003)	0.002 (0.003)
Log GDP per capita		11.786*** (3.296)	14.062*** (3.990)	13.287*** (4.437)	17.321*** (4.860)
Credit to the Private Sector		-0.016 (0.019)	-0.00002 (0.017)	-0.017 (0.023)	-0.027 (0.022)
Interest Rate		-0.039 (0.028)		-0.048 (0.033)	-0.075** (0.029)
Log Inflation		-2.723 (2.634)		-3.560 (3.122)	1.496 (3.393)
Institutional Quality					0.014 (0.044)
Observations	333	210	298	178	158
R <sup>2</sup>	0.026	0.195	0.139	0.231	0.233
Adjusted R <sup>2</sup>	-0.702	-0.476	-0.589	-0.529	-0.504
F Statistic	1.674 (df = 3; 190)	5.527*** (df = 5; 114)	5.182*** (df = 5; 161)	3.827*** (df = 7; 89)	3.046*** (df = 8; 80)

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table 3.7: Lag Trade openness, labour market rigidity vs employment in the service sector.

### 3.7 Trade Openness and Self-Employment in Africa.

The poorest and least developed countries in the world are African countries. Although trade in Africa over the last few decades has grown substantially, economic progress in African countries is still lagging. Kingdon et al. (2006) argue that the failure of the labour market to create good jobs and the rigidity of labour market laws has led to an increase in open unemployment and self-employment in Africa. This section will analyze the effect of trade openness on the rate of self-employment in Africa.

Table 3.8 presents the descriptive statistics of important variables for Africa, developed countries and all countries in my sample. As explained in section 3.4, there are 164 countries considered in this chapter and 51 of them are African countries. Self-employment is much higher in Africa than the rest of the world at a mean of 70.3% when compared to 46% in the full sample and 18% in developed countries. According to the World Bank (2019), a high rate of self-employment is an indicator of a weak economy with weak labour market systems that cannot accommodate workers in the labour market. A 70% average self-employment rate means that in most African countries, a large proportion of the labour market is in the self-employed sector. There are two potential reasons for a high percentage of self-employed workers in total employment. It could be as a result of entrepreneurial talent spilling over from formal employment (employment pull factors) or because of the inability to or the cost of and difficulty in finding stable employment in the formal sector (unemployment push factors). (Pietrobelli, 2004). Self-employment in Africa and most developing countries seems to be for the second reason (Kucera and Roncolato, 2008). The vast majority of self-employed workers in Africa are low skilled workers who make a living by doing low skill jobs. In Africa, low levels of investment, weak democratic institutions, an unstable economic environment and a high population of mostly young people has led to a system of low production and a formal sector that is not thriving. (Rodrik, 1999)

High self-employment is likely due to the inability to find employment coupled with the growing population of mostly young people (Njuguna and Wa-

Variable	Obs	Mean	Std.Dev.	Min	Median	Max
AFRICAN COUNTRIES						
Self-Employment	150	70.258	23.285	6.771	80.777	94.881
Trade Openness	215	61.738	27.759	12.876	54.710	167.799
Labour Market Rigidity	207	1.570	0.431	0.580	1.700	3.500
DEVELOPED COUNTRIES						
Self-Employment	108	17.632	8.301	6.020	16.040	46.919
Trade Openness	154	77.887	43.493	17.437	68.735	267.490
Labour Market Rigidity	165	1.578	0.597	0.065	1.710	2.982
ALL COUNTRIES						
Self-Employment	486	45.983	28.717	1.157	42.851	94.881
Trade Openness	690	73.626	46.846	0.658	62.166	372.487
Labour Market Rigidity	672	1.579	0.492	0.065	1.650	3.500

Table 3.8. Summary Statistics.

home, 1987). Self-employment is, therefore a problem for these economies. House et al. (1993) explain that the unprecedented population growth coupled with limited opportunities for employment (as unemployment is already very high) leads Kenyans to seek income through self-employment in urban non-agriculture activities. Reducing the rate of self-employment should be an important goal for African countries. Opening up to trade is often viewed as a way to increase employment opportunities in a country.

Average Trade openness in Africa is lower than in developed countries and all countries in the sample. The mean amount of trade in GDP in Africa is 1.3 times lower than in developed countries and 1.2 times lower than in all countries. Meanwhile, the mean of labour market rigidity in Africa is almost the same as in other countries and advanced economies.

### 3.7.1 Graphical evidence

In this subsection, the relationship between trade openness and self-employment and the impact of employment laws on self-employment in

Africa is presented visually. Figure 3.3 shows a negative trend between self-employment and trade openness and a positive trend between labour market rigidity and self-employment in Africa. On average, more openness to trade reduces the rate of self-employment and stringent labour market regulation leads to a higher rate of self-employment in Africa.

Figure 3.3. Self-Employment vs Trade Openness and Labour Market Rigidity in Africa (mean)

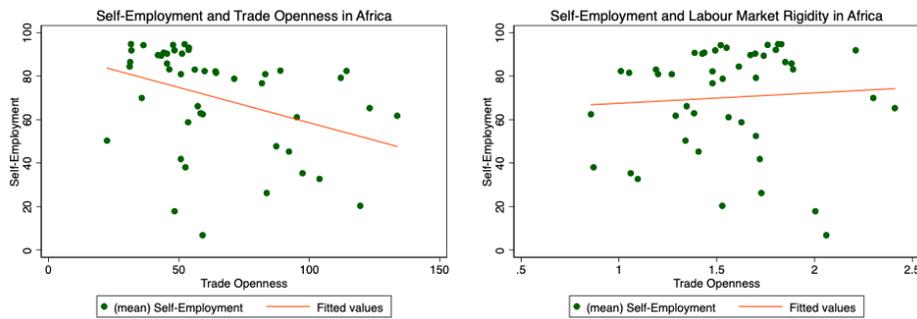
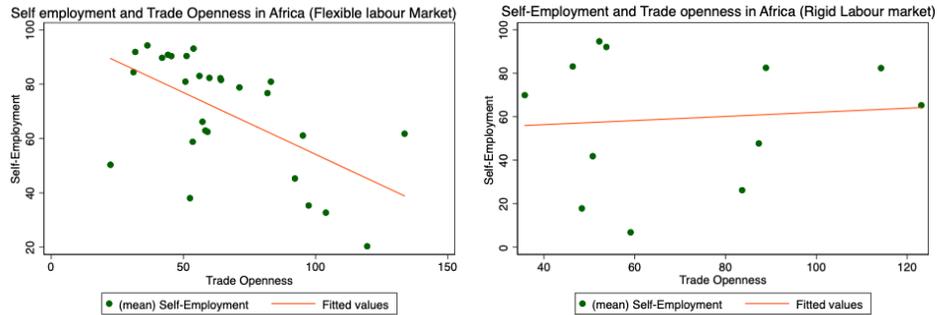


Figure 3.4. Self-Employment vs Trade openness in Flexible and Rigid African Labour Markets (mean)



In figure 3.4, the relationship between trade openness and self-employment is presented for African countries with flexible and rigid labour markets. The classification of labour market rigidity is based on the median labour market rigidity for each country between 1980 and 2004 (in five-year averages) which is 1.7. Countries with labour market rigidity less than 1.7 are considered flexible labour markets, and above 1.7, the labour market is rigid. For African

countries with more rigid labour market regulations as trade opens up, self-employment is increasing. In contrast, the opposite is true for African countries with more flexible labour market regulations.

Figure 3A.1 in the appendix presents the regression analysis of the relationship between trade openness and self-employment in Africa between 1980 and 2004 in five-year averages. The effect of trade openness on self-employment is statistically insignificant and has a different direction depending on whether labour market rigidity and the interaction between trade openness and labour market rigidity is added to the regression. In column 2 when trade openness is tested on self-employment without labour market rigidity and the interaction term, the relationship between trade openness and self-employment is positive. In the other columns, where trade openness and labour market rigidity are included in the regression, there is a negative relationship between trade openness and self-employment. In column 4 however, labour market rigidity has a negative and statistically significant relationship with self-employment in Africa implying that similar to the regression results in table 3.2, a more rigid labour market may increase the rate of self-employment in Africa. The interaction term, however, has a statistically significant but positive effect on self-employment rate in Africa. This may signify that even though having a rigid labour market can increase the rate of self-employment, when trade opens up in an African country with more rigid labour market laws, the rate of self-employment may fall. To make sense of this results, I analyse two African countries with different degrees of labour market rigidity.

In the next section, two African countries, one with a more rigid labour market (South Africa) and one with a more flexible labour market (Ghana) are analysed to examine the impact of trade openness on self-employment in these countries given the degree of labour market rigidity and to understand this relationship in the context of the historical background, labour market structure and trade policy in the country. Kingdon et al. (2006) argue that self-employment in Africa is as a result of the inability of the labour market to create well-paying jobs for the growing labour market and that the lack of

labour market flexibility is partly to blame for this outcome. This claim will be carefully investigated.

### **3.7.2 South Africa**

This section will explore the impact of trade openness and labour market rigidity on the South African labour market with emphasis on the self-employment sector. There are more stringent labour market regulations in South Africa. Unemployment is high, and self-employment is relatively low in South Africa. This may be due to barriers to entry into the informal sector and most importantly, due to their efficiency at enforcing the rigid labour market laws. Given that there are more stringent labour market regulations in South Africa, compared to other African countries, this subsection will investigate the historical background of international trade and labour market laws to understand their contribution towards the state of the labour market.

#### **3.7.2.1 Background on the economy**

South Africa is the southernmost country on the African continent. It is classified as a developing upper-middle-income country according to the United Nations country classifications (2019). However, unemployment, poverty and inequality in South Africa is amongst the highest in the world. Although self-employment in South Africa is one of the lowest on the African continent, employment in services is very high, up to 71% in 2014, according to the CIA world factbook.

Even though South Africa gained independence in 1961, apartheid rule shaped their post-independence years till 1994 when Apartheid officially ended. The labour market still suffers from the effects of the inadequate education system, international economic isolation, and economic policies that favoured capital over labour during the apartheid regime(Burger and Woolard, 2005). These challenges have been difficult for the country to overcome and now more than two decades later, unemployment is still very high, and the structure of em-

ployment unfavourable for long term economic growth. In fact, unemployment in South Africa is amongst the highest in the world (Rodrik, 2006).

However, even though South Africa is similar to other African countries in terms of high levels of poverty and inequality, high rate of unemployment amongst others, the rate of self-employment in South Africa makes it different from other African countries. Self-employment in South Africa is comparatively low averaging below 20% between 1990 and 2019, while most African countries average above 70% self-employment rate for the same period. The low rate of self-employment is as a result of barriers to entry into the self-employment sector and not due to the fact that labour is employed in the formal sector. Kingdon et al., (2006) also note that the high labour market rigidity and the efficiency at enforcing these stringent labour market laws may be the main reason why unemployment in South Africa is so high and self-employment so low. These rigid laws stipulate minimum wages and working conditions on all industries and sectors irrespective of the firm size and as such, impose high labour costs on firms. These high costs affect small firms negatively, and as such, the average firm size in South Africa is quite large.

### **3.7.2.2 Self-employment and labour market rigidity in South Africa**

Table 3.9 presents the structure of employment in South Africa from 1980 – 2019 in five-year averages. This data is collected from the World Bank’s world development indicators. Even though more recent unemployment estimates are lower than during and immediately following the Apartheid era(1948 - 1994), the rate of unemployment in South Africa is still very high compared to more developed economies. In addition, the structure of employment does not follow one that is favourable for long term growth as employment in manufacturing is falling while employment in services is high and rising. This is in line with the findings of Borat (2000) who shows that net employment in the services sector in South Africa from 1970 to 2000 was rising. The post-apartheid regime emphasised protecting workers, especially in the middle and

Variable	1990-1994	1995-1999	2000-2004	2005-2009	2010-2014	2015-2019
Self-Employment	17.230	17.137	19.126	17.624	15.189	15.028
Unemployment	28.964	29.836	31.326	26.076	24.709	26.498
Employment in Manufacturing	28.388	27.682	28.110	27.284	23.794	23.427
Employment in Services	60.772	62.033	61.980	66.482	71.421	71.183
Employment in Agriculture	10.840	10.285	9.909	6.234	4.785	5.391

Table 3.9. Structure of Employment in South Africa From 1980 – 2019 in Five Year Averages.

lower range of skill and income. They did this by introducing employment laws like The Labour Relations Act of 1996, The Basic Condition of Employment Act of 1997 and The Employment Equity Act of 1998 to improve labour standards and conditions and to protect workers from disadvantaged backgrounds.

Burger and Woodland (2003) show that there is conflicting evidence on the degree of labour market rigidity in South Africa, with some reports presenting high rigidity and others proposing that labour market rigidity is not as high as is usually perceived. However, in this study and the data used from Campos and Nugent (2012) labour market rigidity in South Africa is amongst the highest in Africa and the world sample. Average labour market rigidity in South Africa between 1980 and 2004 is about 2.0, which is higher than the average for Africa in the same period.

As explained in the previous section, Self-employment in South Africa is very low compared to the rest of Africa, even though South Africa suffers from very high levels of unemployment. This can be observed when self-employment in Table 3.9 is compared to the Africa subsection in Table 3.8. Rodrik (2008) proposes that the weakness of the non-mineral tradeable sector to produce low skilled jobs is partly to blame for this. Unemployment is also high because of the cost of entry into the self-employed sector (Kingdon and Knight, 2001).

### 3.7.2.3 International trade in South Africa

South Africa has made significant progress towards liberalizing trade post-apartheid era. Efforts to open up to international trade began earlier still

with significant attempts to move away from high tariff, non-tariff barriers and import substitution industrialization policies happening in the 1970s (Edwards, 2005). Trade liberalization was considered because although South Africa pursued protectionist policies for many decades from the 1920s, economic growth was still very slow even in the protected industries (Erten et al., 2019). Furthermore, employment generation in South Africa has been very low, and unemployment is high in both the formal and informal sector in South Africa.

Erten et al., (2019) show that trade liberalization led to a decline in formal and informal sector employment (mainly driven by a fall in manufacturing employment) using data on the local labour market and comparing industries that were more exposed to tariff cuts to those that were not. They also show that unemployed workers in South Africa are more likely to become discouraged workers, exit the labour force and rely on government support after that. In addition to the explanations given in the previous two sections, this may also explain why self-employment in South Africa is so low with such a high rate of unemployment.

Table 3.10 shows a high level of trade as a percentage of GDP in South Africa, and figure 3.5 shows a positive correlation between trade openness and self-employment in South Africa. In figure 3,5, the absolute deviation from the mean of self-employment and trade openness between 1990 and 2005 is calculated and then divided by the standard deviation to see the correlation trend.

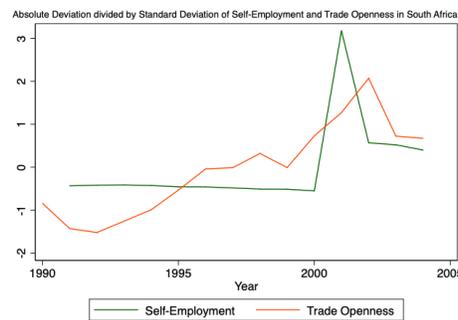
Although there is a positive correlation between self-employment and trade openness in South Africa, the data shows that even as trade opened up in South Africa, self-employment has remained very low and unemployment is still high. There is reason to believe that one of the reasons for this trend is the rigidity of the labour market in South Africa. Kingdon et al. (2006) rightly observe that although there are barriers to entry into the informal and self-employment sector, these barriers do exist in other African countries where the rate of self-employment is high. They explain that the efficiency at enforcing stringent labour market laws is one of the factors that differentiate

Variable	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004	2005-2009	2010-2014	2015-2019
Trade (% of GDP)	52.266	49.737	39.423	46.576	53.697	61.079	61.136	60.085
Exports (% of GDP)	27.215	28.682	21.719	23.981	28.133	30.086	30.248	30.172
Imports (% of GDP)	25.052	21.056	17.703	22.596	25.563	30.993	30.888	29.913

Table 3.10. Structure of International Trade in South Africa From 1980 – 2019 in Five Year Averages.

the South African labour market from most other African countries.

Figure 3.5. Trade openness and Self-employment in South Africa



The correlation between self-employment and trade openness in South Africa in Figure 3.5 shows a positive relationship. In South Africa with one of the highest levels of labour market rigidity in Africa, this is an interesting observation since the rate of self-employment in South Africa is on average much lower than the mean self-employment rate in Africa.

### 3.7.3 Ghana

In this section, the relationship between trade openness and self-employment in Ghana; an African country with flexible labour market regulations is explored. Using the historical background as the foundation, this section explores the nature of international trade in Ghana since independence. Ghana was one of the first sub-Saharan African countries to adopt economic liberalization policies in Africa (Sakyi, 2011). This was in an attempt to recover the economy from the economic downfall it had been facing since independence due to bad economic policies, the fall in the prices of primary products including cocoa

(one of their main exports), political unrest amongst other reasons(Ackah & Aryeetey, 2012).

### **3.7.3.1 Background on the economy**

In 1957, Ghana became the first sub-Saharan African country to gain independence with relatively few barriers to trade and investment in comparison with other countries in the West African region. (CIA World Factbook, 2019; Sakyi, 2010). The Ghanaian economy is heavily dependent on agricultural products and natural resources for exports. Since independence, the economy has adopted various economic policies to accelerate growth and development. Soon after independence, Kwame Nkrumah, the first Ghanaian head of state embarked upon import substitution and industrialization strategies. However, this was a premature move because coupled with the falling world prices for primary products in the mid-1960s, the high cost of these strategies put negative pressure on the economy and caused an economic decline. However, in the 1980's the president at the time adopted the Economic Recovery Program (ERP) and the Structural Adjustment Program (SAP), which included massive trade liberalization to move the economy forward. The Ghanaian economy is still recovering from the effects of post-independence economic strategies.

### **3.7.3.2 Self-employment and labour market rigidity in Ghana**

Table 3.11 shows the main employment statistics for Ghana from 1990-2019 in five-year averages. Average self-employment in Ghana has been falling from 1990 and is now closer to 70%, the average in Africa. Self-employment in Ghana is, however, still higher than the average in Africa, even at its lowest average level of self-employment. Heintz and Pickbourn (2012) explore the factors that determine the level of self-employment in Ghana based on workers characteristics and find that factors like age, sex, marital status and being a native Ghanaian significantly impact the likelihood of operating a household enterprise in Ghana. This chapter is interested in the structural reasons for such a high level of self-employment and the role that opening up to trade has

Variable	1990-1994	1995-1999	2000-2004	2005-2009	2010-2014	2015-2019
Self-Employment	83.920	83.049	82.093	80.932	78.035	75.016
Unemployment	5.119	7.891	8.454	4.914	6.028	6.728
Employment in Manufacturing	13.904	14.009	14.069	14.151	14.404	18.629
Employment in Services	29.279	30.304	30.869	32.322	39.401	46.869
Employment in Agriculture	56.818	55.688	55.062	53.527	46.195	34.502

Table 3.11. Structure of Employment in Ghana From 1980 – 2019 in Five Year Averages.

played in this reality.

Labour market regulations in Ghana are more flexible. This may explain the high level of self-employment. As the labour market is unable to absorb most workers into the formal sector and there are few barriers to entry into the self-employment sector, there is a high proportion of workers that are self-employed (Kingdon et al., 2006).

### 3.7.3.3 International trade in Ghana

Trade reforms to liberalise trade and increase openness to world markets were fully underway in Ghana early in the 1980s. In response to the decline in the economy in the late 1970s and early 1980s, due to a severe drought and falling world prices for cocoa and some other of their export commodities around that period, the economy underwent an economic recovery program in 1983 to transform the economy into a more market-oriented system. Over the next few years, tariff and non-tariff barriers to trade will decline as the economy makes an effort to be more integrated into the world market. (WTO, 2001) Table 3.12 presents the structure of international trade in Ghana from 1980 to 2019 and shows the general increase in the percentage of the trade-in GDP. Trade openness in Ghana rose sharply around the mid-1990s and has stayed comparatively high ever since.

Figure 3.6 presents the absolute deviation divided by the standard deviation of self-employment and trade openness between 1990 and 2005 and clearly shows a negative correlation between the two. As trade opens up, self-employment in Ghana is falling. Since labour market regulations in Ghana are more flexible,

Variable	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004	2005-2009	2010-2014	2015-2019
Trade (% of GDP)	12.876	38.027	49.980	75.467	104.108	74.111	76.340	72.864
Exports (% of GDP)	6.032	16.364	19.316	30.994	43.327	28.098	32.285	33.032
Imports (% of GDP)	6.844	21.663	30.664	44.473	60.781	46.014	44.055	39.832

Table 3.12. Structure of International Trade in Ghana From 1980 – 2019 in Five Year Averages.

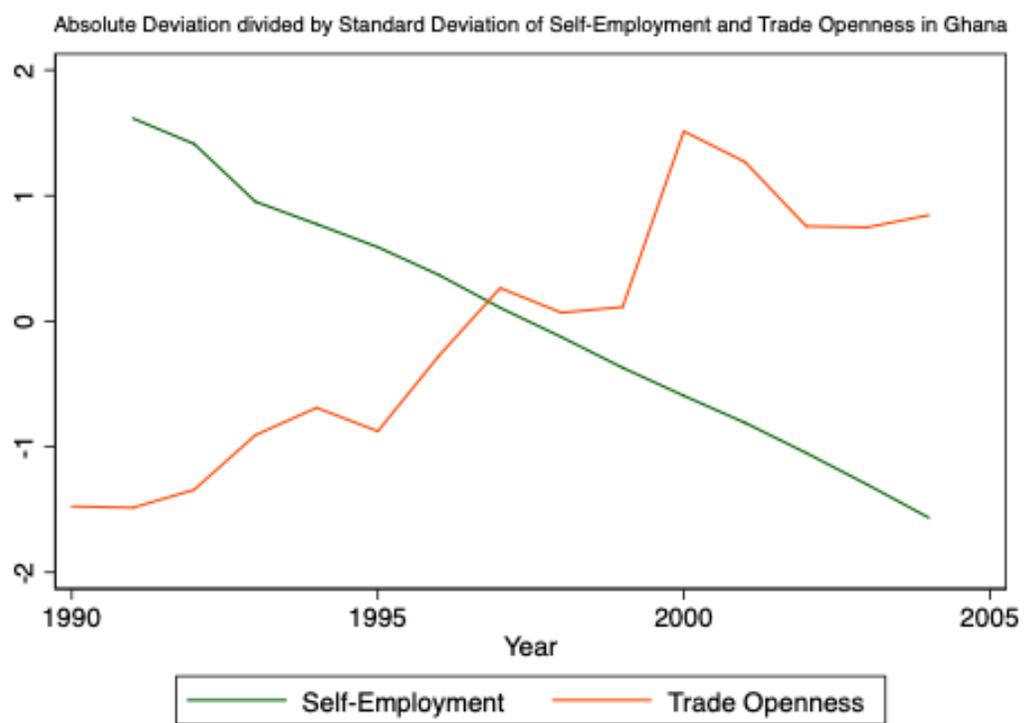
this correlation is supported by the result of the regression analysis in column 4, figure 3A.1 of the appendix which indicates a negative and statistically significant relationship between labour market rigidity and self-employment in Africa. A more flexible labour market rigidity may be associated with a higher level of self-employment, as is observed in the case of Ghana. Also, the interaction between trade openness and labour market rigidity has a positive and statistically significant relationship with self-employment, which implies that given the level of labour market rigidity, as trade opens up, self-employment is rising.

### 3.8 Conclusion

This chapter shows that trade openness may increase self-employment in countries with more rigid labour market regulations and reduce it in countries with more flexible labour market regulations. These results are supported using data for all countries and analysing South African and Ghanaian data carefully. A high level of self-employment is an undesirable outcome that plagues labour markets across Africa and some other developing countries. Self-employment in Africa has remained high even though it is falling slightly in most countries. However, since most African countries are now more open to trade than ever before, it is useful to explore the impact of trade openness on self-employment.

Most papers in the area of trade openness have explored its impact on GDP or GDP per capita in a country (Frankel & Romer, 1999; Rodriguez & Rodrik, 2000; Singh, 2010 amongst others). However, the labour market is an important engine through which national income is transferred into any economy.

Figure 3.6. Trade openness and Self-employment in Ghana



Any effect of trade openness on GDP must be evaluated through the lens of the labour market so that the impact of trade openness on the people of a country can be observed.

Trade openness by itself does not significantly affect self-employment in a country, but its effect on self-employment depends on the level of labour market rigidity in that country. This shows the significance of having the appropriate labour market institutions that allow labour markets to adjust to international trade. This is particularly significant as trade is seen as one of the most important factors necessary for economic growth and development. In fact, international trade is essential for the survival of small African countries as they cannot afford to close themselves off from the world market (Rodrik, 1999).

Therefore, for African countries, it is important to consider how the labour market regulations impact the way international trade affects the labour market to understand how to mitigate any negative effects. Fields (2019) proposes that policy focus should be on increasing returns to earnings of the self-employed and increasing the opportunities for the unemployed poor in developing countries to easily transition into self-employment instead of on policies to reduce self-employment.

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## **Appendix**

	Self-Employment				
	se_ilo2019				
	(1)	(2)	(3)	(4)	(5)
Trade Openness (TO)	-0.029 (0.021)	0.029 (0.036)	-0.038* (0.022)	-0.032 (0.024)	-0.070 (0.078)
Labour Market Rigidity (LMR)	0.031 (0.599)		-0.230 (0.615)	-1.428*** (0.415)	-2.846 (2.157)
TO*LMR	0.009 (0.011)		0.015 (0.012)	0.030*** (0.010)	0.061 (0.047)
Log GDP per capita		-7.878 (4.932)	-4.807 (3.639)	-9.990*** (3.169)	-2.940 (5.538)
Credit to the Private Sector		0.015 (0.035)	-0.003 (0.032)	0.021 (0.036)	0.003 (0.041)
Interest Rate		0.004 (0.035)		-0.001 (0.027)	0.021 (0.024)
Log Inflation		-4.719 (8.264)		-5.951 (6.048)	-2.646 (7.196)
Institutional Quality		-0.057 (0.053)			-0.074 (0.047)
Observations	110	37	108	48	35
R <sup>2</sup>	0.038	0.304	0.075	0.278	0.371
Adjusted R <sup>2</sup>	-0.665	-0.791	-0.678	-0.696	-0.783
F Statistic	0.821 (df = 3, 63)	1.017 (df = 6, 14)	0.952 (df = 5, 59)	1.102 (df = 7, 20)	0.883 (df = 8, 12)

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table 3A.1. Trade Openness vs Self-employment in Africa

**List of 164 countries:** Afghanistan Albania, Algeria, Angola, Argentina, Armenia, Australia, Austria, Azerbaijan, The Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Benin, Bhutan, Bolivia, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cabo Verde, Central African Republic, Chad, Chile, China, Colombia, Comoros, Congo, Dem. Rep., Congo, Rep., Costa Rica, Cote d'Ivoire, Croatia, Cuba, Cyprus, Czech Republic, Denmark, Djibouti, Dominican Republic, Ecuador, Egypt, Arab Rep., El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, Gabon, The Gambia, Georgia, Germany, Ghana, Greece, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong SAR China, Hungary, Iceland, India, Indonesia, Iran, Islamic Rep., Iraq, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Korea, Rep., Kuwait, Kyrgyz Republic, Lao PDR, Latvia, Lebanon, Lesotho, Liberia, Libya, Lithuania, Luxembourg, Macedonia, FYR, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Morocco, Mozambique, Myanmar, Namibia, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russian Federation, Rwanda, Saudi Arabia, Senegal, Seychelles, Sierra Leone, Singapore, Slovak Republic, Slovenia, Somalia, South Africa, Spain, Sri Lanka, Sudan, Suriname, Sweden, Switzerland, Syrian Arab Republic, Tajikistan, Tanzania, Thailand, Togo, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Uzbekistan, Venezuela RB, Vietnam, Yemen, Rep., Zambia, Zimbabwe.

## The Helpman and Itskhoki Model

This model is a two-country, two-sector model of international trade in which one sector produces homogeneous products and the other differentiated products. Labour is the only factor of production. The market for the homogeneous products is competitive while the differentiated-product industry has firm heterogeneity and is in monopolistic competition. Both sectors are subject to search and matching frictions in the labour market and wage bargaining. As a result, some of the workers searching for jobs end up being unemployed.

Countries are similar except for the rigidity of their labour markets which can vary across the sectors. However, labour market rigidity does not matter as much for the homogeneous good sector. Also, homogenous goods are not traded internationally. Therefore, in this paper, the homogeneous goods sector is similar to the self-employment sector because the rigidity of the labour market affects the self-employment sector less and it is reasonable to assume that the self-employment sector production is not internationally traded as this sector focuses on providing domestic goods and services.

The greater the search and matching frictions, the more rigid that labour market is. When a firm in the homogenous good sector is matched with a worker, they produce one unit of the homogeneous good. The model assumes that in the homogeneous product sector every firm employs one worker which is a common assumption in the search and matching literature. Since firms in this sector are homogeneous in terms of productivity and produce a homogeneous good, the analysis does not change if homogenous good firms are allowed to hire multiple workers, as long as they remain price takers.

In the differentiated-product industry, firms are heterogeneous in terms of productivity but face the same cost of hiring in the labour market. A firm from country  $j$  that seeks to employ  $h_j$  workers bears the hiring cost  $b_j \cdot h_j$  in terms of the homogeneous good, where  $b_j$  is exogenous to the firm yet it depends on sectoral labour market conditions. A worker cannot be replaced without cost and so a worker inside the firm is not interchangeable with a worker outside the firm, and workers have bargaining power after being hired.

Workers exploit this bargaining power in the wage determination process.

The model assumes that the  $h_j$  workers and the firm engage in strategic wage bargaining with equal weights in the manner suggested by Stole and Zwiebel (1996a, b). This implies that the firm gets a fraction of the revenue and the workers get a fraction. This bargaining outcome is derived under the assumption that at the bargaining stage a worker's outside option is unemployment, and the value of unemployment is zero because there are no unemployment benefits and the model is static.

Anticipating the outcome of this bargaining game, a firm that wants to stay in the industry chooses an employment level,  $h_j$ , and whether to serve the foreign market, to maximise profits. Firms find it optimal to increase their employment up to the point at which the bargaining outcome is a wage rate equal to the cost of replacing a worker,  $b_j$ . Since this hiring cost is common across all firms, in equilibrium country  $j$  firms of all productivity levels, exporters, and non-exporters alike pay equal wages,  $w_j = b_j$ . Higher labour market rigidity, reflected in a higher  $b_j$ , reduces proportionately gross operating profits. Therefore, an increase in  $b_j$  is similar to a proportional reduction in the productivity of all country  $j$  firms.

A prospective firm enters the industry only if expected profits from entry are at least as high as the entry cost. The differentiated goods sector firm faces the choice of whether to export or not given the relative fixed cost of exports and the variable cost of exports. The model shows that exporting is profitable if and only if there exists a cutoff productivity level such that all firms with productivity above this cutoff export (provided they choose to stay in the industry) and all firms with productivity below it do not export. Also, higher variable trade costs cut into export profits, enabling only more productive firms to profitably export. Firms with low productivity that do not export may nevertheless make money from supplying the domestic market if their productivity is high enough.

A country is populated by families and labour is supplied by each family from their fixed supply of labour. They choose to allocate workers to the

homogenous and differentiated sector and there is perfect intersectoral mobility ex-ante and no mobility ex-post. The efficiency of the matching process (which is determined by the number of vacancies available and the number of workers searching for jobs) and the degree of labour market frictions varies across countries. When the firm is matched with a worker, they bargain over the surplus from the bargaining relationship described before.

In this model, labour market frictions in any sector rise with the cost of vacancies and declines with the efficiency of the matching process. That is, the expected income of a worker rises with the efficacy of matching in that sector and declines with the cost of vacancies

Building on these insights the model proves that in the country with relatively higher labour market rigidity, for exporting to be profitable for a firm in the differentiated goods sector productivity at the firm level must be higher. A disadvantage in labour costs needs to be compensated with a productivity advantage to make exporting profitable. This is because, in a country with higher labour market frictions expected profits from exporting are lower at the entry stage, which has to be offset by higher expected profits from domestic sales for the free-entry condition to be satisfied. This also implies that lower-productivity firms find it profitable to serve the domestic market.

Furthermore, there is less entry of firms into the differentiated-product industry in the country in which labour market frictions are relatively higher. This country has a lower real consumption of differentiated products due to the home market effect. The presence of trade costs means that a country suffers a disadvantage in the local supply of differentiated products when its labour market frictions are higher in the differentiated industry.

Once the number of workers in the differentiated goods sector has been determined given the cut off for entry, the remaining workers go search for jobs in the homogenous goods sector.

Based on the explanations above, the model proposes that a reduction in a country's labour market frictions in the differentiated sector raises its real consumption index and therefore its welfare, but it reduces the trade partner's

welfare. Even though their trade partner now pays lower prices for imported varieties and gets access to a larger set of foreign varieties, they enjoy better terms of trade as a result of improved labour market conditions brought on by the reduction in labour market frictions. This is because the lower labour market frictions in their differentiated goods sector act like productivity improvements in that country, which makes the firms of their trade partners less competitive and therefore crowds them out from this sector. As a result, fewer of their trade partner firms enter the industry. The entry of the domestic firms of their trade partner does not fully compensate their consumers for the exit of their firms because of the home market effect so that their welfare declines, and this negative welfare effect is larger than the welfare gain from improved terms of trade.

In addition, the country with lower labour market frictions in the the differentiated sector has a lower export cutoff for firms to enter the market and a higher domestic cutoff; therefore it also has a larger fraction of exporting firms in the differentiated-product sector and exports differentiated goods on net while the country with higher labour market frictions will have a net export of homogenous goods.

Therefore, a reduction in labour market rigidity in a country leads that country to benefit from trade and their trade partners with higher labour market rigidity to lose from trade and have fewer firms in their differentiated goods sector. The workers who would have been employed in the differentiated goods sector of the country with higher labour market frictions will therefore seek employment in the homogenous goods sector. This is the mechanism through which a rise in labour market rigidity increases the rate of self-employment.

## 4 Chapter 4: The Impact of Trade Liberalisation on Structural Change in Africa: Evidence from Ghana

**Abstract:** This chapter uses the generalised synthetic control (GSC) method to estimate the effect of trade liberalisation on the pattern of structural change in Sub Saharan Africa using Ghana as a case study. The results indicate that trade liberalisation may have led to the trend of deindustrialisation that many African economies are experiencing as GSC analysis suggests that if trade liberalisation did not happen in Ghana when it did, value-added and employment shares of services would not have grown as much as it did and value-added shares of industry would be higher.

**JEL:** F16; F62; F63 **Key Words:** Trade liberalisation; Structural change

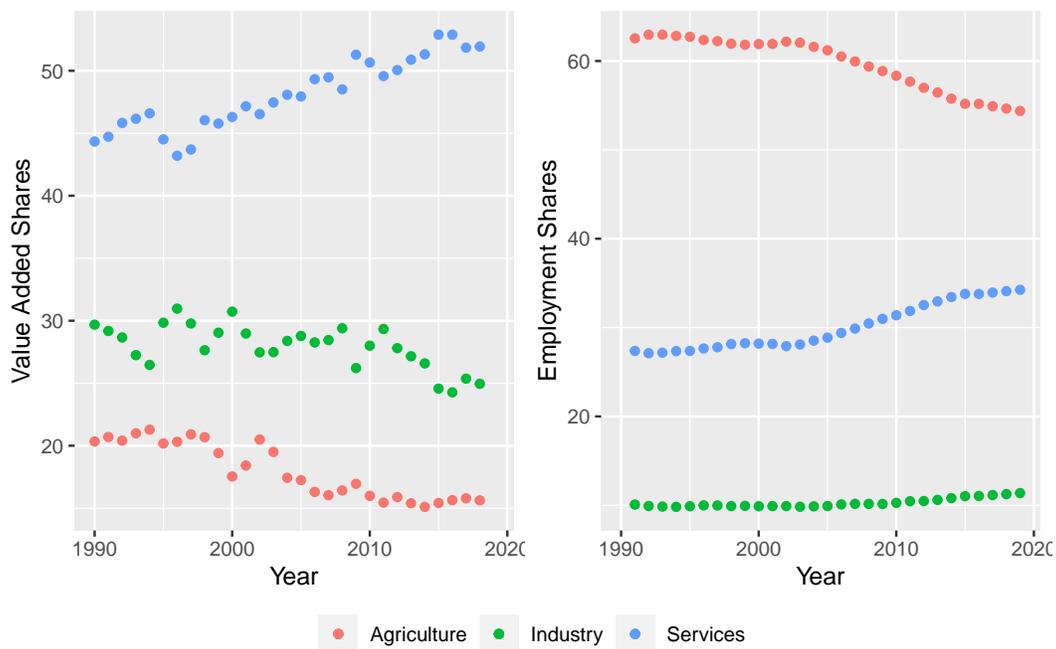
## 4.1 Introduction

Structural change is necessary for sustained economic growth, and modern economic development (Kuznets,1971; Chenery, 1979; Syrquin,1988; McMillan and Rodrik, 2011; Martin, 2019) and trade liberalisation can encourage structural change (Dessy et al., 2010; Teignier,2018). Structural change in development economics often refers to the change in the relative importance of the three main sectors of the economy in terms of factor use and production. Meanwhile, structural transformation refers to the interrelated processes of structural change and economic development. Syrquin (1988) explains that because sectoral returns to factors of production are never equal, a country can always benefit from reallocating resources towards sectors with higher productivity.

The stylised facts of structural change are that in the process of economic development, countries generally move from having larger shares of income and employment in agriculture (the primary sector) towards a higher proportion in manufacturing and industry (the secondary sector). At higher levels of GDP, the services(the tertiary sector) is usually the more dominant sector in terms of income and employment. ( Kaldor; 1963, Kuznets; 1971, and Maddison; 1980). This is related to the view by Lewis (1954) that economies move from traditional to modern sectors in the process of economic development. Trade liberalisation is seen as crucial for structural change. Many sub Saharan African countries(SSA's) experienced trade liberalisation as part of the World Bank's Structural Adjustment Programme (SAP's) in the 1990s. However, structural change in SSA has followed a different pattern to what is expected. Figure 4.1 presents structural change in SSA (averaged over the countries) between 1980 and 2020 using value-added and employment shares of the three main sectors of every economy. Most African nations have followed a strange pattern of structural change by transitioning out of agriculture into services in the process of development while the industrial sector remains relatively stagnant. As can be observed from figure 4.1 average employment shares of agriculture for SSA's is quite high even though value-added shares of agri-

culture is extremely low. Also, employment shares of services in SSA is the second highest with employment shares of industry being extremely low and stagnant on average. Figure 4.1 is baffling because according to the theories on structural change, the service sector usually becomes a more dominant part of an economy at higher levels of economic growth and development. However, even though SSA's are some of the least developed countries in the world, the service sector plays a significant role in employment and value-added share of GDP. Moreover, Industrialisation has not played a significant role in Africa's structural change, even though trade liberalisation reforms have been a major part of sub Saharan African policies for economic development (Oyejide, 2003).

Figure 4.1: Value Added and Employment Shares of Different Sectors for SSA



Data source: Value added share and employment share data is from the World Bank's World Development Indicators

Standard theories of structural change expect that with international trade, countries can transition out of agriculture by importing agricultural goods when the domestic price under autarky is higher than the international prices. In addition, in order for countries to transition out of agriculture into manu-

facturing and other industries, the subsistence needs of the population have to be provided for by imports. Moreover, for the industrial sector to keep growing without being limited to just the domestic market, international trade must occur.

Matsuyama, however, notes that standard theories of structural change are based on the assumption that economies are closed when, in reality, most economies are interdependent. He explains that this leads to a misunderstanding of structural change as in an open economy, the pattern of structural change can be ambiguous when the trade effect is accounted for.

Trade liberalisation is viewed as an essential and necessary step towards economic development and structural change. For countries to transition out of agriculture into manufacturing, the subsistence needs of the population have to be provided for by imports. Besides, for the industrial sector to keep growing without being limited to just the domestic market, international trade must occur. Tiegner(2018) showed that trade not only contributed to structural transformation in South Korea, but it accelerated the transition out of agriculture in Great Britain in the 19th century. He also posits that structural transformation in South Korea would have been faster if limitations to trade were eliminated at an earlier period in time.

The World Bank, in their study published in 1981, attribute most of the blame for the poor performance of African economies on their trade policies. Therefore, in the 1980's when many SSA countries were struggling with macroeconomic instability and high levels of poverty, international development organisations such as the World Bank and IMF pushed for trade liberalisation amongst other macroeconomic reforms as a means to encourage structural transformation and therefore economic growth in African countries (Mkandawire & Soludo, 2003; Aryeetey & Moyo,2012). However, structural change in Africa has not been growth-enhancing (McMillan and Rodrik, 2011) and African countries have not experienced the development expected from trade liberalisation.

In fact, African industries may have been unintentionally sabotaged by trade

liberalisation. By the time African countries opened up to trade, world prices of industrial products had already begun to fall, and industry was no longer the engine of growth it used to be (Rodrik, 2016). This may explain why African countries moved from having a high employment share in agriculture to high employment share in services instead of industry. Even though the value-added share of industry is high, trade liberalisation exposed the industrial sector to immense competition on the world market.

My point is that structural change is important, and Africa has not experienced the pattern of structural change that is expected to enhance economic growth even after liberalising trade. Therefore, I use generalised synthetic control methods (GSC's) to evaluate the effect of trade liberalisation on structural change in Africa using Ghana as a case study. I focus on one country because country case studies force us to understand the historical and institutional context in which the liberalisation policy operates. I use Ghana because it is a good case study for sub saharan african economies. Ghana was one of the first African countries to gain independence in 1957 (Brooks and Aggrey-Fynn, 2007) and to liberalise trade in 1985 (Waxciarg and Welch, 2008). Like most African countries, Ghana opened up to trade as a part of the structural adjustment programme which was the Washington Consensus' response to the particular socio-economic problems that African countries faced in the 1980s and in a bid to raise income and standards of living in Africa to that of the rest of the world. This makes Ghana a particularly interesting country to study being one of the 'oldest' African countries in terms of democracy and political independence. Also, Ghana is particularly suitable for the method applied as GSC's require a control group of countries that are similar to the treated country but have not experienced the treatment in the period considered. Ghana reached trade liberalisation status at least five years before most other African countries.

Structural change in Ghana has also followed a similar pattern to most other African countries (Fig. 3). Ghana, like other SSA countries, has high employment share in agriculture and service sectors instead of in industry which

has the highest value-added share of GDP and is generally considered to be a more productive sector. In addition, Ghana's economic evolution is characteristic of the rest of the continent who generally rely on natural resources for income with a small and slow-growing industrial sector (Jedwab & Osei, 2012). This evolution involves post-independence import substitution industrialisation, economic decline in the late 1970's to '80s and then transition into structural adjustment programmes in the late 1980s to 1990s in order to encourage economic growth. Another important reason to use Ghana as the case study is that it has one of the best statistical systems in sub-Saharan Africa, so this kind of economic analysis is possible for Ghana. Most African countries have sparse data and weak statistical systems.

The GSC is a useful tool for comparative case studies. It generalises the SCM, which uses a set of control units to create a synthetic version of the observed treated unit (Abadie et al., 2010). An advantage of using SCM is that the procedure for selecting comparison units is data-driven and transparent. In standard comparative case studies, the selection procedures for comparison units are ambiguous and may lead to unlikely comparison units because of the failure to show the existence of common characteristics between treated and control units (Billmeier and Nannicini, 2013). SCM allows us to show the similarities between the treated unit and the synthetic control unit in the pre and post-intervention period. It is transparent about the relative contribution of each control unit to the counterfactual. Although it can be challenging to find a single untreated unit that approximates perfectly to the most important characteristics of the treated unit, the paper by Abadie et al. (2010) explain that when you combine multiple control units, you can provide a better comparison for the treated unit than any single unit alone. Also, SCM safeguards against extrapolation by restricting the sum of the weights to one. The GSC improves upon the SCM by using interactive fixed effects (IFE) model first to estimate the latent factors and factor loadings (these are the time-varying coefficients and unit specific intercepts) by projecting pretreatment outcomes (Xu, 2017). Then it uses the SCM procedure to estimate counterfactuals using the latent factors and factor loadings.

In addition, GSC accounts for the presence of time-varying unobservable confounders unlike standard fixed-effects panel regressions or difference-in-difference. A strength of the GSC method is that it promotes research honesty in observational studies as the research study can be designed without access to post-intervention outcomes. That is to say; this study was designed without knowing how the design will affect the outcome. Also, the *gsynth* software which is used to implement the GSC method in this chapter calculates the necessary confidence intervals and standard errors meaning there is no need to follow up with placebo treatments as is necessary for the SCM approach. It also uses more information from the control group. Therefore, the GSC method improves efficiency under standard model specifications (Xu, 2019; Rudkin and Cai, 2019).

This chapter contributes to the literature on structural change and development by analysing the patterns of structural change in developing countries looking specifically at the African experience. Industrialisation has not played a significant role in structural change in Africa, and there has been expansion in the services sector. This is baffling as the service sector usually becomes a more dominant part of an economy at higher levels of economic growth and development. Although most African economies have experienced some growth, they are still on average the countries with the lowest levels of economic growth and development in the world.

This chapter also contributes to the literature on trade liberalisation in developing countries as it does not just try to understand the pattern of structural change in Africa but also to estimate how trade liberalisation affects it using Ghana as a case study.

The findings support the hypothesis by Rodrik (2015) who explains that a plausible explanation for the premature deindustrialisation (the situation where the industrial sector is declining while the significance of the service sector is growing) in African economies is trade and globalisation. The results show that if trade liberalisation did not occur in Ghana, value-added of industry would have been higher in the long term while value added of services would not have

grown as much as it did. This also supports Jebwab and Osei (2012). They clarify that the contribution of the service sector increased after the 1980s because of globalisation.

Although most African economies have experienced some growth, they are still the countries with the lowest levels of economic growth and development in the world. This chapter aims to understand this unexpected pattern of structural change in Africa and estimate how trade liberalisation affects it, using Ghana as a case study.

The next section will present the research done on trade liberalisation and structural change in general and in Africa and how trade liberalisation may impact structural change. Section 4.3 provides a brief history of structural change in the Ghanaian economy since independence, section 4.4 provides the empirical approach to the research question, and section 4.5 presents the results.

## **4.2 Literature Review**

This section will explore and analyse the existing literature on structural adjustment, the literature on the relationship between trade liberalisation and structural adjustment and available work on the patterns of and the effect of trade liberalisation on structural adjustment in Africa.

In the process of economic development, the stylised facts of structural change are that there are shifts in the sectoral composition of economic activity from sectors with lower productivity such as primary goods sectors towards sectors with higher productivity such as the industrial and service sectors. Using data from the EU KLEMS database for a group of advanced economies for the years 1980 to 2005, Jorgensson and Timmer (2011) show that agriculture typically employs less than 6 per cent of the population and hours worked in agriculture in advanced economies is low and declining. In addition, the significance of the contribution of the services sector has increased over time in these countries.

In the same vein, Herrendorf et al. (2014) find that for low levels of development, the value-added share of agriculture is lower than employment share of agriculture, the nominal value-added share of services is higher at higher levels of GDP, and as the value-added share of services starts to increase, the value-added share for manufacturing in GDP starts to decrease. They use data for a range of developing and developed countries primarily from the Historical National Accounts (HNA) database of the University of Groningen to extend the traditional one-sector growth model to include multiple sectors and in so doing, enable growth models to account for structural transformation.

Trade liberalisation is often seen as a way to foster structural transformation. Teigner (2018) finds that trade plays a crucial role in structural transformation by allowing countries to import part of their agricultural needs while they focus on industrialisation. He uses a two-sector neoclassical model with non-homothetic preferences to show that under autarky, as income rises and technological change occurs in a developing country, consumption and production of agricultural goods fall, and peoples consumption shares of non-agricultural goods rise. Therefore productive resources are transferred from the agricultural sector to the non-agricultural. However, with international trade, structural transformation accelerates because countries can import agricultural goods. He finds that trade led to faster capital accumulation and higher consumption of agriculture and manufactured goods in Great Britain in the 19th century and that structural transformation in South Korea would have followed the same trajectory had there not been trade laws that limited importation.

On the other hand, Melitz(2003) develops a dynamic industry model with heterogeneous firms to analyse the intra-industry effects of international trade. His model shows that international trade will lead the most productive firms to move to the traded sector, the less productive firms remain in the domestic sector, while the least productive firms will be forced to exit. This inter-industry movement of firms can contribute to welfare gains by boosting productivity. In addition, Blanco et al. (2018) find that trade liberalisation led to an increase in the employment shares and value-added shares in manufacturing in

North Korea after empirically testing the effect of trade openness on structural change. They use synthetic control methods on data from the Penn World Table (PWT) for four Asian countries choosing from a pool of other countries that had not liberalised at the time of each country's liberalisation to create a synthetic version of that country. Not only was there an increase in the employment and value-added shares of manufacturing in North Korea after opening up to trade, but the magnitude of the increase was also quite high, up to a 3% increase in employment shares and an 11% rise in value-added shares after five years. They also find that trade liberalisation is positively correlated with an increase in the value-added share of manufacturing in Indonesia and Singapore. However, it seemed to have had no effect on the employment share of manufacturing in the Philippines.

Timmer et al. (2014) use data to show that some developing countries do not follow the same pattern of structural change for economic growth and development as advanced economies. Labour share in agriculture in most developing countries is higher than it should be, given the low productivity of the agriculture sector, labour share in services is also quite high while labour share in manufacturing is low. African countries have moved from having high labour and value-added share in agriculture to having high labour and value-added share in services (especially trade distributive services) without first experiencing considerable economic growth. In fact, Gollin et al. (2013) explains that there is an agricultural productivity gap in developing countries with agriculture employing a large portion of the working population even though it is the least productive sector of the economy.

The pattern of structural change experienced by African countries is referred to as premature deindustrialisation. Advanced countries have been experiencing deindustrialisation for decades as the service sector becomes a more dominant part of income while industry is in decline. Rodrik(2016), however, focuses on developing countries and attempts to explain why the same trend of deindustrialisation is observed in less developed countries at such an early stage of economic development. He focuses on the pattern of deindustrialisa-

tion since the 1980s and posits that it cannot be explained by the differential rate of technological progress of the three sectors. Although this is a plausible explanation for the observed deindustrialisation of advanced economies, Rodrik proposes that the premature deindustrialisation seen in developing countries in Sub Saharan Africa and Latin America is better explained by trade and globalisation. Since most developing countries have comparative advantage in agriculture and not in industry, as they open up to trade, they not only become net importers of manufacturing but they also become subject to the declining relative price of manufacturing that advanced economies face. Therefore, opening up to trade might have caused these countries to import the deindustrialisation trend. In this chapter, I estimate the impact of trade liberalisation on employment and value-added shares of industry and therefore test this proposition.

DeVries et al. (2015) document structural transformation in 11 African countries in recent years by developing and using the Africa Sector Database (ASD). The ASD is an annual time series data of value-added and persons employed in the ten broad sectors of an economy. These facts of structural adjustment in Africa come out of the data: Manufacturing expanded strongly roughly between 1960-1975. This was a period of post-independence growth and development for most African countries. However, due to the political and currency instability across the continent, economic growth after this period was very low. Employment share of industry became relatively stagnant while the employment share of agriculture fell. These events triggered the structural adjustment programs (SAP's) of the 1980s. The SAP's were the policies of the World Bank, and IMF forced upon countries in economic crises in exchange for loans. Trade liberalisation was one of the policies of the SAP's. However, the SAP's were unsuccessful for various<sup>2</sup> reasons.

After the slow growth rebound of the 1990s, the employment share of agricul-

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<sup>2</sup>Most importantly, because of poor policy design due to a lack of understanding of the socio-economic environment. See Mkandawire and Soludo (1999) for a systematic analysis of the effects of the SAP's in Africa. Also, Oppong (2014) presents a synthesis of the important papers on the effects of SAP's on African economies

ture fell further, but the employment share of manufacturing did not rise as fast. Deindustrialisation was occurring as workers moved from agriculture to services; especially trade distribution services<sup>3</sup>. However, this move towards services was not as a result of an increase in service sector productivity; it was due to the combined effects of market-oriented policies and increased incomes which led to an increase in demand for consumer goods and services. This led to a phenomenon best described by Jedwab (2013) as consumption cities where increasing demand for urban services like transport, trading and personal services led workers to move towards these sorts of jobs.

McMillan and Rodrik (2011) document that structural change in Africa has been growth reducing as workers seem to move towards low productivity sectors instead of high productivity ones<sup>4</sup>. Their empirical work identifies the factors that determine whether structural change is growth-enhancing or growth reducing and they find that growth reducing structural change usually occurs in countries with comparative advantage in primary products and natural resources, countries with an overvalued currency and countries with relatively rigid labour market regulations. This supports the explanation for premature deindustrialisation in developing countries put forward by Rodrik (2015) and outlined above. Because African economies do not have comparative advantage in manufacturing and industry, structural change has been growth reducing and opening up to trade may have nurtured the undesirable deindustrialisation of African economies. In this chapter, the focus is on Ghana, a country which has comparative advantage in primary products such as cocoa and gold.

Also, Diao et al., (2017) show that in Latin America and Africa, recent growth episodes were not driven by rapid industrialisation which is an essential part of structural change for economic growth and development. The impact of trade liberalisation on structural adjustment in Africa is still not clear. This chapter, therefore, seeks to understand the effect of trade liberalisation on

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<sup>3</sup>Distributive services includes wholesale and retail trade, transport services

<sup>4</sup>Workers tend to move towards lower productivity sectors like services instead of industry and manufacturing.

African countries using Ghana as a case study and the trade liberalisation episode of the 1980s as the treatment effect.

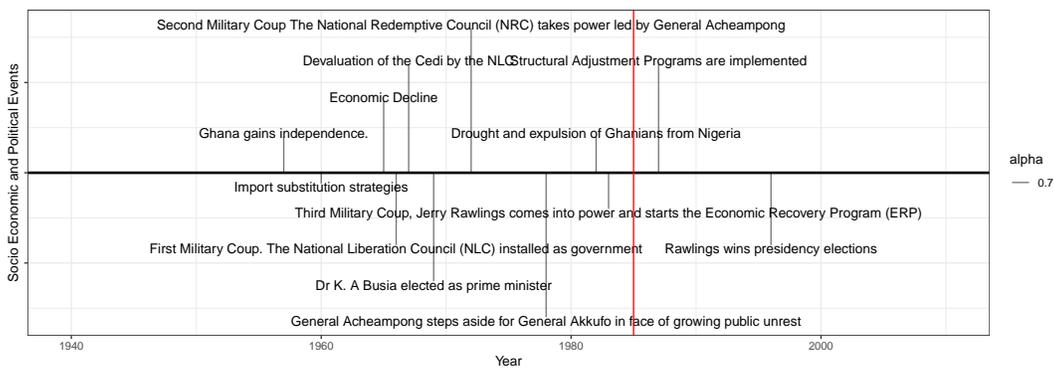
### 4.3 The Ghanaian Economy

This section introduces the socio-economic and political environment in Ghana since independence and the pattern of structural change that the country has followed. This section also contextualises trade liberalisation in Ghana by explaining the factors that led to trade liberalisation in Ghana in the early to mid-1980s.

#### 4.3.1 Trade reforms and the Ghanaian economy since independence

It is necessary to understand why trade liberalisation occurred when it did in Ghana, and in order to do so, we need to understand the Ghanaian economy before trade liberalisation. Figure 4.2 provides a summary of the timeline of economic and sociopolitical events that defined the Ghanaian economy after independence. This section reveals that trade liberalisation was necessitated by the unprecedented disasters that the economy faced.

Figure 4.2: Timeline of Economic and Socio-political events in Ghana



Ghana was one of the first African countries to gain independence in 1957, and Kwame Nkrumah was the first Prime minister of the country. At the time of independence, Ghana had high GDP per capita compared to other Sub

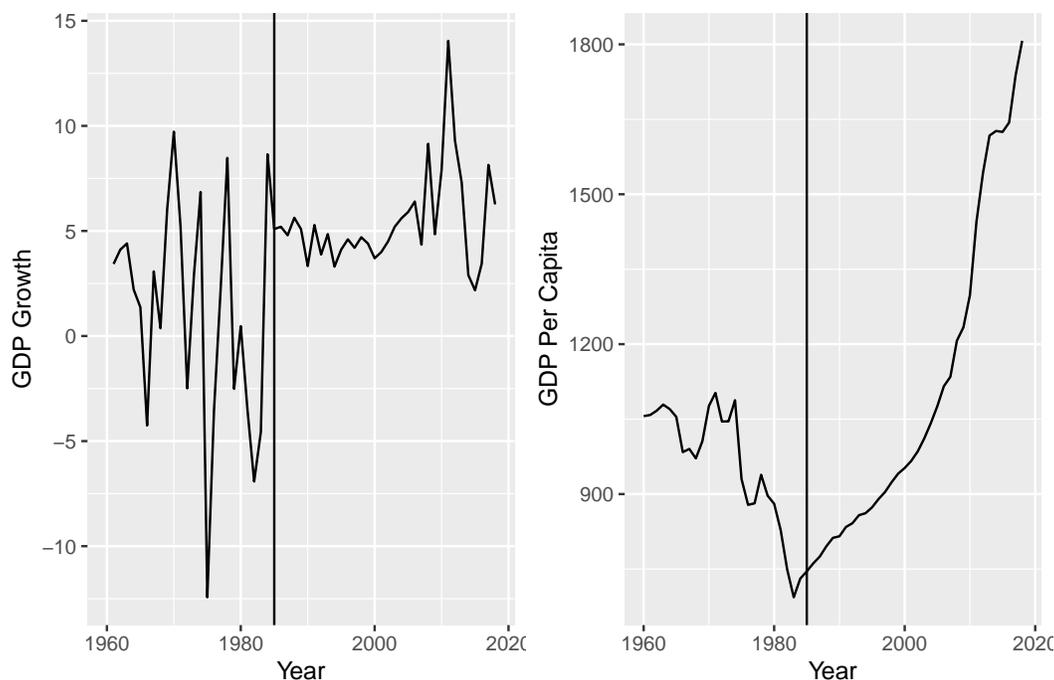
Saharan African countries with a strong agricultural economy which relied heavily on the production of cocoa (Brooks and Aggrey-Fynn, 2007; Jedwab and Osei, 2012). Six years before independence, the country was already self-governed. That is, even though Ghana was still under colonial rule, in 1951, the colonial government acceded to allow the government of the country to be run by Ghanaian people. Kwame Nkrumah who at the time was in jail for being a major part in the protests against colonial rule, won the first election under the new system of government. He won this election not just because of the growing anti-colonialist sentiment of the Ghanaian people but because he promised prosperity to the middle-class population who were feeling the adverse effects of inflation and diseased cocoa trees (Leith and Söderling, 2000).

After independence, Nkrumah launched import substitution industrialisation (ISI) strategies and increased public investment in order to begin the process of economic development. This involved large government expenditures which were funded by the budget surplus at the time of independence. These strategies, although essential for economic development, were embarked upon too early in Ghana. At this time, land was abundant, and Ghana was not in a situation of labour surplus in agriculture; therefore, the price of labour was high. Besides, the supply of skilled labour was low, so it was not the right time to embark on capital intensive manufacturing (Jedwab and Osei, 2012).

The unexpected adverse effects of these strategies led to the eventual overthrow of Nkrumah in 1966 in a coup as the Ghanaian economy did not experience the promised and expected economic progress. As can be seen in Figure 4.3, both GDP growth and GDP per capita faced decline from 1960 till about 1980. Coupled with a general fall in the world price of primary products, the high-level government spending from prematurely embarking on industrialisation strategies pushed the economy into a position of high debt and political instability. This situation followed Nkrumah's regime even after he was overthrown. In fact, according to Szereszewski (1965), in 1983, Ghana had the same GDP as in 1939.

The years after Nkrumah's overthrow were no better as subsequent military

Figure 4.3: GDP Growth and GDP Per Capita in Ghana



leaders adopted policies similar to Nkrumah's and between 1974 and 1983, per capita income in Ghana declined by almost 35% (Fig 2). By 1981, following two successive coups after the one that deposed Nkrumah, Jerry Rawlings inherited a declining economy. Not only that but the drought and subsequent bush fires that affected the production of other agricultural products and the rise in population due to the repatriation of Ghanaians from neighbouring Nigeria in 1983 made the early 1980's a damaging time for the Ghanaian economy. Rawlings had no choice but to undertake the World Bank's structural adjustment programme (SAP) under the Economic Recovery Programme(ERP) in 1983 (Jedwab and Osei, 2012). This involved reducing government spending by privatising state enterprises, reducing import restrictions, removing price controls and the devaluation of the Ghanaian Cedi. Trade liberalisation was an essential part of the SAP's.

To contextualise the trade reforms which were a part of the SAP's this study begins much earlier. In the early 1950s, Ghana had a fairly liberal trade

regime. However, as explained before, the economic policies embarked upon immediately following independence led to a situation of high debt and instability in the country. This caused the government to resort to a series of strong measures to solve the economic problems. In July 1961, Act 71 (a foreign exchange control act) was introduced and by December of the same year, import licencing was introduced in response to the balance of payments deficits. In 1963, the government launched a seven-year development plan which involved massive government spendings to fuel the ISI strategy for development. This, in addition to the already increasing balance of payments deficit, led to further protectionist trade strategies (Jebuni et al., 1994).

Ghana's macroeconomic situation however continued on its negative trajectory and by 1967, the government at the time embarked upon macroeconomic austerity, began import liberalisation strategies and devalued the currency by 43% (Laryea and Akuoni,2012). However, this led to a rise in the prices of imported goods and therefore a general rise in the prices of goods and services, as a direct result of the dissatisfaction caused by these policies and the fact that the balance of payments situation was not significantly improved, in January 1972 there was another military coup and a revaluation of the currency which caused the earlier currency devaluation to be only around 26%. In the same year, the government imposed stiffer import controls to prevent the balance of payments from further deterioration (Jebuni et al., 1994). There was little macroeconomic management between 1973 and 1983. The political environment was fraught with tension, and a variety of instruments were introduced to achieve the government's political directives rather than for economic progress. The unfortunate economic situation triggered coups in 1979 and 1981(Jebuni et al. 1994; Laryea and Akuoni,2012).

Due to the mismanagement of the decades after gaining independence and unprecedented drought, by the start of the 1980s the country was in a dire state with GDP at very low levels, the manufacturing sector facing decline and infrastructure in poor conditions(Jedwab and Osei, 2010).

The unprecedented drought was one of the worst the country had ever experi-

enced. Almost every part of the country was affected by the drought. Apart from causing lower levels of production of crops and other agricultural produce, the drought also had the awful effect of causing bushfires which swept across the country in 1983, causing widespread and massive destruction of farms. The bushfires destroyed an estimate of 10000 hectares of food crop farms in southern Ghana alone. Several hectares of land was also devastated in the forest region. Also, in the Northern region, rice farms were devastated by the bushfires, and a majority of them could not have a harvest as a result of the drought. Therefore, rice production and production of food crops in general, such as cocoa fell drastically in this period.

The droughts are hypothesised to have been caused by climate variability and the sustained disruption of the natural ecological systems/balance by humans (Ofori-Sarpong, 1986). The declining production and exports of cocoa and other agricultural products led to declines in foreign exchange and government revenue (Puplampu, 1999). It was also around this time that about a million Ghanaian citizens were forced out of Nigeria and back to Ghana, putting more pressure on the economy (Killick, 1978).

In 1983, Jerry Rawlings, the military leader at the time with the support of the World Bank and IMF embarked upon the ERP and then the SAP in 1987. Trade liberalisation policies were central to the ERP and SAP, and it entailed reducing import restrictions, tariff adjustments, foreign exchange liberalisation and other such initiatives. In 1990, further liberalisation occurred with the lowering of the import tax rate on raw materials and capital goods by five percentage points. By 1998, the value-added tax (VAT) replaced the sales tax to meet the standards of the Economic Community of West African States (ECOWAS); a regional economic union. The VAT was considered to be a more efficient method of taxation. Trade policy stayed relatively the same in the 1990s and 2000s with a simple tariff structure with relatively few barriers to trade (Brooks et al., 2007).

The main objectives of these reforms were to restore incentives for the production of exports, to increase the overall availability of foreign exchange and to

improve foreign exchange allocation. Trade policy under SAP included tariff adjustments, import liberalisation, liberalisation of foreign exchange, deregulation of domestic market controls.

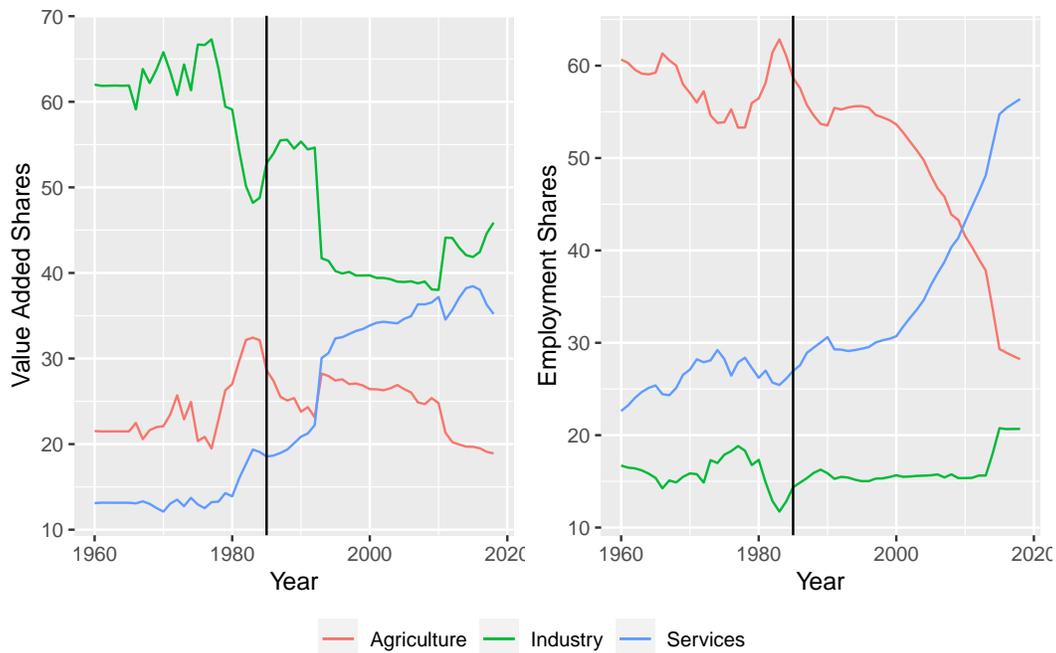
Trade liberalisation was therefore done in response to economic decline. In this chapter, GSC is used to estimate the counterfactual which in this case is value-added and employment share of agriculture, industry and services in Ghana if trade liberalisation did not begin in Ghana in 1985.

In 2001, John Kufor took over from Jerry Rawlings, and the economy began to grow at a faster rate. Ghana is now one of the most advanced African nations, experiencing progress socioeconomically and politically. The manufacturing sector of the Ghanaian economy has also become more competitive in the world market. However, structural adjustment in Ghana has not followed the expected pattern of structural change. The next section presents and describes the observed pattern of structural change in Ghana from 1960 to 2018.

### **4.3.2 Structural change in Ghana**

Like most African countries, Ghana has followed an unusual pattern of structural change. Figure 4.4 presents the graph of value-added and employment shares of agriculture, industry and services for Ghana from 1960 to 2018. Value-added share of industry is the highest over the entire period while value added of services is the second-highest before 1993 although the gap between the two is wide. From 1993, the value-added share of services was rising towards the value-added share of industry, but the lines never meet. Value-added share of agriculture rose sharply in the mid-1970s and declined sharply in the mid-1980s and kept falling till the late 1990s after which it stabilised. Employment shares present a different story with employment share of agriculture being the highest and employment share of services the second-highest, the two lines converging and their trends exchanging positions in 2010 while the share of industry is the lowest the entire period.

Figure 4.4: Value Added and Employment Shares of Different Sectors



Data source: United Nations databank, Penn World Tables

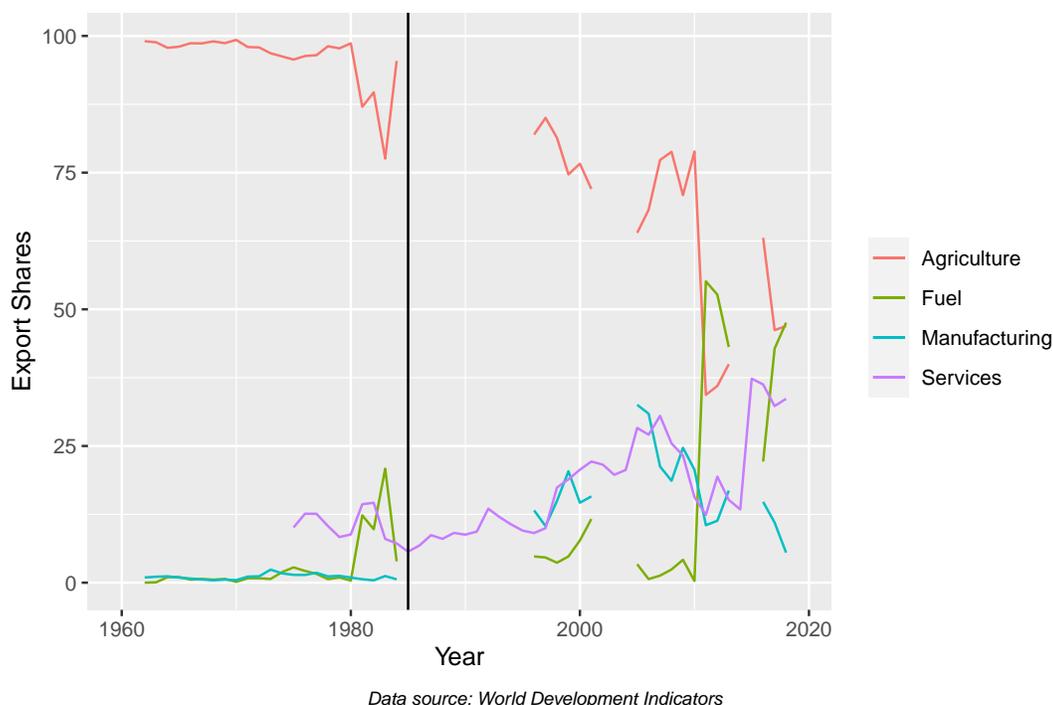
The post-independence aim and therefore, policies were to foster industrialisation and economic independence in addition to the newly earned political independence (Nkrumah et al., 1963). As can be seen in Figure 4.4, the value-added share of industry is the highest of the three sectors over most of the years presented so, in a sense, this aim was achieved. However, employment shares of industry are also the lowest in the entire period presented. Similarly, the composition of the industrial sector was not favourable to Ghanaian enterprises as private foreign investors held a large share of the industrial sector, followed by state enterprises. The smallest share of the industrial sector was owned by private Ghanaian enterprises (Leith, 1974). In addition, the high value-added shares presented may reflect the prices of industrial goods.

Value-added share of industry fell sharply from almost 67% in 1977 to 48% in 1984. By 1985, it began to recover but dropped again in 1993 when value-added share of services was on the rise. As value-added share of industry was falling, value-added share of services was rising while value-added share of

agriculture remained quite low—the economic problems of that period affected value-added of industry. The manufacturing industry shrank in 1976 when per capita income declined and did not start to recover till 1983.

As a result of the high investment spending in industry in the first few decades after independence, the employment share of industry was relatively high between 1960 and 1970 after which it dropped sharply and though it recovered, remained low. (Jedwab & Osei, 2012)

Figure 4.5: Export Shares of Different Sectors



From Figure 4.4, it is easy to observe that unique changes happened in Ghana between the late 1970s and mid-1980s. Employment and value-added share of industry faced massive declines while employment and value-added share of agriculture and services rose.

In figure 4.5, export shares of the different sectors are presented. This is so it is clear how trade liberalisation changed the composition of trade in Ghana. Agriculture exports started at the highest with almost 100%, but after the

early 1980s, it started to fall. This is very likely due at least in part to the droughts and the fires that ravaged most of the country in that period. Data for the years between 1985 and 1991 are not available. By 1993, exports of agricultural goods are lower than before 1985 at about 80%. Export of services and manufacturing begin to rise but manufacturing exports peak in 1995. Although the service sector declines around 1995 as well, it picks up again in 2015 and continues rising till 2019.

The next section will focus specifically on and give more details about the Ghanaian economy from the late 1970s to mid-1980s in order to explain the history and timeline of trade liberalisation, which happened in 1985 in Ghana. It will show that trade liberalisation in Ghana was in response to the socio-economic difficulties faced in Ghana during this period.

## **4.4 Empirical Section**

This section will present the data used and explain how the GSC is used to estimate counterfactuals for value-added and employment shares of industry, agriculture and services for the treated country; Ghana.

### **4.4.1 Methodology**

In order to measure the effect of trade liberalisation on structural adjustment in Africa this chapter uses the GSC method developed by Xu, (2017) which improves upon the SCM developed by Abadie et al., (2010). The SCM estimates the effect of a treatment on a unit by assigning weights to a selection of control units in order to create a synthetic control unit with data for relevant characteristics of the treated unit before treatment. In other words, the SCM aims to create a synthetic control unit that closely resembles the treated unit by using a weighted combination of the relevant characteristics of potential control units. It would estimate the counterfactual, which in this case is value-added and employment share of agriculture, industry and services in Ghana if trade liberalisation did not begin in Ghana in 1985. The

GSC computes these counterfactuals using interactive fixed effects (IFE) and SCM. It uses the IFE method and control group data first to obtain latent factors (time varying coefficients). Then it estimates factor loadings (unit specific intercepts) by linearly projecting pretreatment outcomes. Then based on the latent factors and factor loadings, it estimates counterfactuals. The GSC treats counterfactuals of treated units as missing data and makes predictions of the post-treatment treated outcome from the control group and IFE model, improving upon the SCM method. It estimates the effect of the treatment on the treated unit even when the parallel trends assumption is not likely to hold.

#### 4.4.2 The model

Suppose there is a sample of  $N$  countries for time  $t = 1, \dots, T$  and the  $Y_{it}$  is the outcome of interest for country  $i$  at time  $t$ . In this chapter, there are six outcomes of interest. Let  $TR$  denote the set of countries in the treatment group, and  $C$  denote the set of countries in the control group.  $N = N_{tr} + N_c$  where  $N_{tr}$  is the number of countries that experience the treatment and  $N_c$  is the number of countries that do not experience the treatment. In this chapter,  $N_{tr} = 1$ . Let time  $T_0$  be the pretreatment period for the treated country which experiences the treatment at time  $T_0 + 1$ . In this chapter,  $T_0$  is the period between 1970 and 1984. The treated country (Ghana) is exposed to the treatment (trade liberalisation) from time  $T_0 + 1$  to  $T$  (i.e 1985 to 2003). The countries in the control group do not experience the treatment in the entire period considered. That is to say that trade liberalisation did not occur in the countries in the control group in the entire period considered. Assume that  $Y_{it}$  is given by a linear factor model.

$$Y_{it} = \delta_{it}D_{it} + x'_{it}\beta + \lambda'_i f_t + \epsilon_{it}$$

where  $D_{it}$  is the treatment indicator and takes a value of 1 when  $i$  is the treated country and  $t > T_0$  and 0 otherwise.  $\delta_{it}$  is the effect of the treatment on country  $i$  at time  $t$ ;  $x_{it}$  is a  $(k \times 1)$  vector of observed control variables,  $\beta$

is a  $(k \times 1)$  vector of unknown parameter,  $f_t$  is a  $(r \times 1)$  vector of unobserved common factors,  $\lambda_i$  is a vector of unknown factor loadings and  $\lambda_i' f_t$  captures any unobserved random variable that can be decomposed into a multiplicative form, and the error terms  $\epsilon_{it}$  are unobserved transitory shocks for country  $i$  at time  $t$  and it has a zero mean.

The treatment effect for country  $i$  at time  $t$  is  $\delta_{it} = Y_{it}(1) - Y_{it}(0)$  for  $i \in TR$  and  $t > T_0$  where  $Y_{it}(1)$  is the outcome for country  $i$  at time  $t$  if  $D_{it} = 1$  (i.e. it was exposed to the treatment) and  $Y_{it}(0)$  is the outcome for country  $i$  at time  $t$  if it  $D_{it} = 0$  (i.e. was not exposed to the treatment). The treatment does not affect the outcome for all countries before time  $T_0 + 1$ , so for  $t \in T_0$  and all countries  $i \in N$ ;  $Y_{it}(1) = Y_{it}(0)$ .

This chapter aims to estimate  $\delta_{it}$  for all  $t > T_0$  for country  $i \in TR$ . Since  $Y_{it}(1)$  is observed for  $t > T_0$ , we only need to estimate  $Y_{it}(0)$  using the estimated latent factors from the control group and factor loadings. The countries in the control group are countries for which data on value-added and employment shares of industry, agriculture and services for 1970 to 2003 are available that have not undergone the treatment (trade liberalisation) at any time within the entire period considered i.e. for all  $t \in 1, \dots, T$ .

GSC estimates  $\hat{Y}_{it}(0)$  in three steps. In the first step, only the control group data is used to estimate an IFE model and obtain the latent factors; then the factor loadings are estimated minimising the mean squared error of the predicted treated outcome in pretreatment periods using the latent factors from step 1. Then finally, the treated counterfactuals ( $\hat{Y}_{it}(0)$ ) are estimated. The GSC chooses a model that minimises the mean square prediction error (MSPE) using a leave one out cross-validation procedure that uses information from the control group and treatment country.

Table 4.1 presents the six variables of interest and the countries that make up the control group for each variable of interest. Unsurprisingly, the countries in the control group for Ghana are other developing countries, mostly from Africa. Most developed countries liberalised trade long before 1985. For each variable of interest, there is a different set of variables that best match it.

These are presented in table 4.2. The data used is a large set of macroeconomic variables and is from a variety of sources, including the world bank’s world development index and the Penn world tables (see table 4A.1 in the appendix). Trade liberalisation year is determined using Waxciarg and Welch’s (2008) work which determines whether a country has liberalised trade or not based on their update of the Sach’s Warner criteria for trade openness.

**Table 4.1** :Control group for each variable of interest.

Structural Change	
Outcomes	Countries in the Control Group
Value Added Share of Industry, Agriculture and Services	Algeria, Angola, Central African Republic, Chad, Congo, Democratic Republic of Congo, Gabon, Haiti, India, Iran, Iraq, Lesotho, Liberia, Malawi, Malta, Myanmar, Nigeria, Rwanda, Senegal, Syria, Togo, Zimbabwe.
Employment Share of Industry, Agriculture and services	Argentina, Benin, Brazil, China, Egypt, Ethiopia, India, Kenya, Malawi, Mauritania, Nigeria, Peru, Senegal, South Africa, Zambia .

In the next section, the data used and their sources are presented.

#### 4.4.3 Data

Data on sectoral shares of GDP is from the World Development Indicators(WDI) from the World Bank Databank. This data presents the breakdown of value-added shares of the ten main sectors of the economy. These are then aggregated into the three main sectors: agriculture, industry and services. The agriculture sector is composed of activities in agriculture, hunting, forestry and fishing. The industry sector is made up of activities in mining

and quarrying, manufacturing, construction, and public utilities and the service sector involves wholesale and retail trade and restaurants, hotels, transport, storage, and communications, financing, insurance, real estate, and business services and community, social, and personal services.

Trade liberalisation is determined using data from Waxciarg and Welch (2008). They used the Sachs-Warner openness criteria to clarify a year of trade liberalisation for all countries. This is the year from which a country consistently meets all 5 Sachs-Warner openness criteria. According to the Sachs-Warner Openness criteria, an economy is considered closed if average tariffs are 40 per cent or more, non-tariff barriers cover 40 per cent or more of the traded economy, the black market has an exchange rate that is at least 20 per cent lower than the official exchange rate, a state monopoly exists on major exports and the economy follows a socialist economic system as defined by Kornai (1992).

The data from Waxciarg and Welch (2008) is used to determine the year of trade liberalisation not only for Ghana, the treated country but also for the countries in the potential control group. Since the countries in the potential control group should not have experienced the treatment (trade liberalisation) in the entire period considered (1970-2004), this data is used to select countries that according to the Sachs-Warner openness criteria, were considered closed for this period.

The data for the control variables used are from various sources, including the WDI and the Penn World Tables(PWT). Table 4A.1 in the appendix presents the source of each control variable.

**Table 4.2** :Control variables for each variable on interest

Structural Change	
Outcome	Observed Control Variables
Value Added Share of Industry	GDP per capita growth, Population growth, Life expectancy, Total persons engaged in the labour force, Fertility rate, Real domestic absorption at constant 2011 USD Domestic credit to the private sector, Agricultural land (in sq km), Land area, Livestock Production index, Food Production Index, Total summed magnitudes of all(societal and interstate) major episodes of political violence.
Value Added Share of Agriculture	GDP per capita growth, Population growth, Life expectancy, Fertility rate, Real domestic absorption at constant 2011 USD ,Agricultural land (in sq km), Land area, Total summed magnitudes of all(societal and interstate) major episodes of political violence. General government final consumption expenditure (% of GDP).
Value Added Share of Services	GDP per capita growth, Population growth, Real domestic absorption at constant 2011 USD, Total summed magnitudes of all(societal and interstate) major episodes of political violence.

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Structural Change	
Outcome	Observed Control Variables
Employment Share of Industry	GDP per capita growth, Population growth, Life expectancy, Total persons engaged in the labour force, Real domestic absorption at constant 2011 USD, Domestic credit to the private sector, Livestock production index Food production index, Total summed magnitudes of all(societal and interstate) major episodes of political violence.
Employment Share of Agriculture	GDP per capita growth, Population growth, Total summed magnitudes of all(societal and interstate) major episodes of political violence.
Employment Share of Services	GDP per capita growth, Population growth, Life expectancy, Total persons engaged in the labour force, Domestic credit to the private sector, Real domestic absorption in constant 2011 USD (in millions ), Land production index, Food production index, Total summed magnitudes of all(societal and interstate) major episodes of political violence.

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## 4.5 Results

In this section, the results of the GSC analysis is presented, and the observed difference between the actual values of each treated variable and the synthetic unit after 1985 is the estimate of the effect of the trade liberalisation episode. The results show the effect of trade liberalisation in Ghana on value-added

and employment shares of industry, agriculture and services. For employment shares, two sets of results are presented (Figure 4.7a and 4.7b). This is because, to include as many countries as possible in the group of potential control countries for employment shares of industry, agriculture and services, and to be able to meet the necessary criteria for GSC that the countries in the potential control units include only countries that did not liberalise trade for the period considered, the posttreatment period for these variables is shorter in the first set of results. The period considered first for employment shares is 1970 to 1990 with 1985 as the year of treatment. The reason for having a shorter posttreatment period is that some of the countries in the group of potential control countries liberalised trade as early as 1991. Therefore, in order to include as many countries as possible in the pool of potential control countries for the employment shares variable, the cut off year considered is 1990. Then the full period (1970-2004) is considered in figure 4.7b, but there are only four countries in the potential control group. The countries in the control group do not meet the Waxciarg and Welch's (2008) criteria for trade liberalisation in the entire period considered so trade liberalisation did not occur in the countries in the control group in the period considered.

A future endeavour could be to perform this exercise with a constrained control group that excludes developing countries and emerging markets and includes only developed countries who do not experience as many structural shocks. This will reduce the potential endogeneity of the control countries. However, as explained earlier, most developed countries liberalised their trade long before Ghana, the first African country to experience trade liberalisation. The developed countries for whom data on trade liberalisation is available from Waxciarg and Welch (2008), the latest year of trade liberalisation is around 1960. These countries therefore cannot be in the control group for Ghana as they have experienced the treatment before 1985 when Ghana the treated country experienced the treatment.

It is important to note that it is difficult to find a perfect control group around an idiosyncratic event. Because trade liberalisation in Ghana was part of the

SAP's which was in response to the unique economic problems the Ghanaian economy faced in the late 1970s till the early 1980's it is quite challenging to find a group that matches the country and faced the same economic problems around the same time. This is, however, an important case to study in order to understand how developing countries like Ghana were affected by standard economic development policies like trade liberalisation. The most appropriate method to study the causal effect of an exogenous event in a single tested unit is the synthetic control method (Abadie et al., 2010). This chapter uses the GSC, which improves on the SCM as it can use all the information from the control group and is more efficient in providing uncertainty estimates. Not only does it fulfil the parallel trends assumption in an observable way, but the parallel trends assumption may also be violated with a simpler method.

This chapter set out to understand the strange pattern of structural change that can be observed in African economies like that of Ghana. This pattern can be seen in Figures 4.1 and 4.4. As the employment share of agriculture falls, labour moves towards services instead of industry. Value-added and employment shares of industry are quite low in African countries. This pattern did not change after trade liberalisation in 1985 in Ghana. In fact, the value-added share of industry continued on its downward trajectory while the value-added share of services continued rising after trade liberalisation.

The results of the GSC analysis for value-added shares presented in figure 4.6 shows that trade liberalisation had little effect on value-added shares of industry and services in the short term. However, in the long term if trade liberalisation did not occur, the value-added share of industry would have been much higher than the actual while the value-added share of services was higher than it would have been if trade liberalisation did not occur. In addition, the value-added share of agriculture would have been higher and grown steadily from 1985 if trade liberalisation did not occur then.

For employment shares, the results presented in figures 4.7a and 4.7b show that the actual employment share of industry was higher than the counterfactual and employment share of agriculture was lower than the counterfactual. This

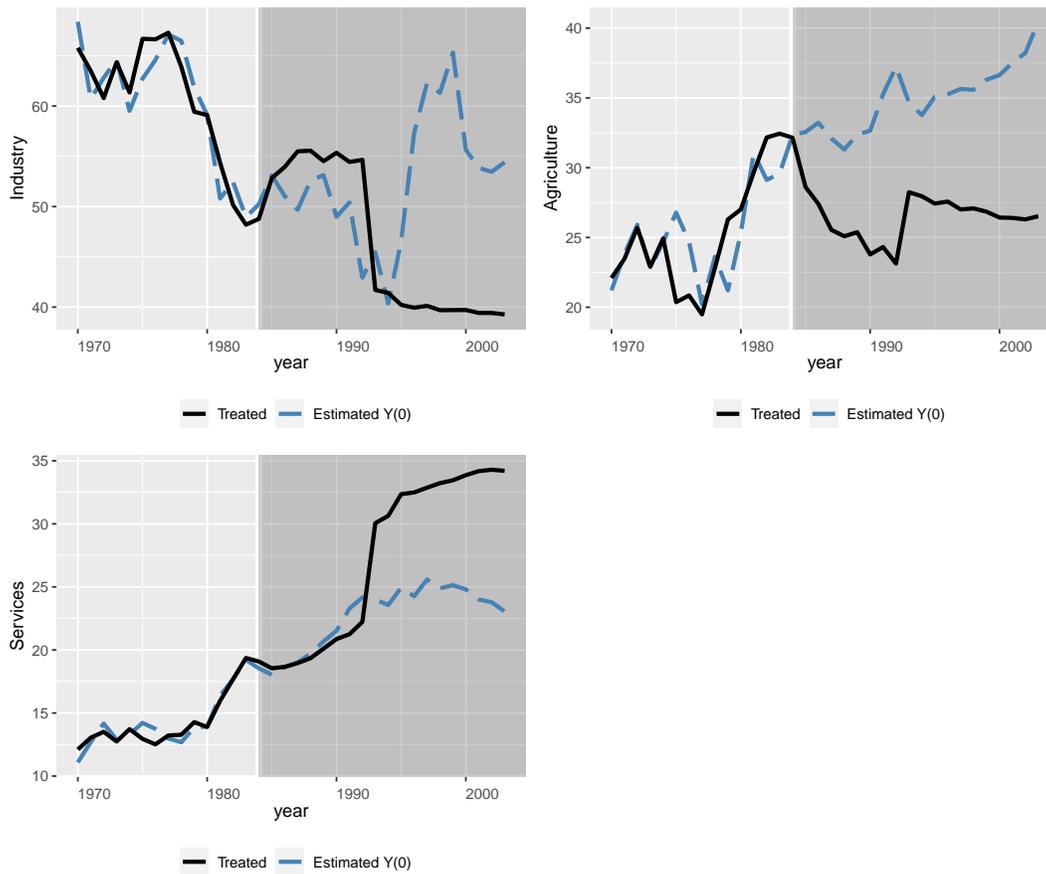
signifies that if trade liberalisation did not occur, the employment share of industry would have been lower after 1985 while the share of employment in agriculture would have been higher. In figure 4.7a, trade liberalisation had minimal effect on the employment share of services, although it shows that employment share of services would have been a little lower than the actual if trade liberalisation did not occur. However, in figure 4.7b (where only the four countries who did not liberalise at all in the entire period considered (1970 to 2003)) the counterfactual for employment share of services is much lower than the actual. This indicates that the employment share of services was higher than it would have been in the posttreatment period if trade liberalisation did not occur.

These results tell us that the trade liberalisation that began in Ghana in 1985 led to the service sector being a more vital sector and to the agriculture sector being less significant in terms of value-added and employment shares in Ghana.

Trade liberalisation also caused the value-added share of industry to be lower and employment shares to be higher after the trade liberalisation episode. This is a more common trend for structural change. In the United States, the employment share of manufacturing has been declining since the 1950s, while real value-added shares have remained constant (Rodrik, 2016). Because of the rapid productivity growth of the industrial sector employment shares of this sector usually start to fall at higher levels of income. Rodrik (2016) uses data for 42 countries which range from advanced to developing countries to show the prevalence of an inverted u shaped manufacturing and the fact that the manufacturing sector is declining over time.

The results in this chapter support Rodrik's (2016) hypothesis that premature deindustrialisation in African countries is likely caused by trade and globalisation. That is to say that the pattern of structural change observed in Ghana where resources moved from agriculture towards services may have been caused by trade liberalisation. It also supports Matsuyama's theory that the pattern of structural change in an open economy can be ambiguous when trade is accounted for.

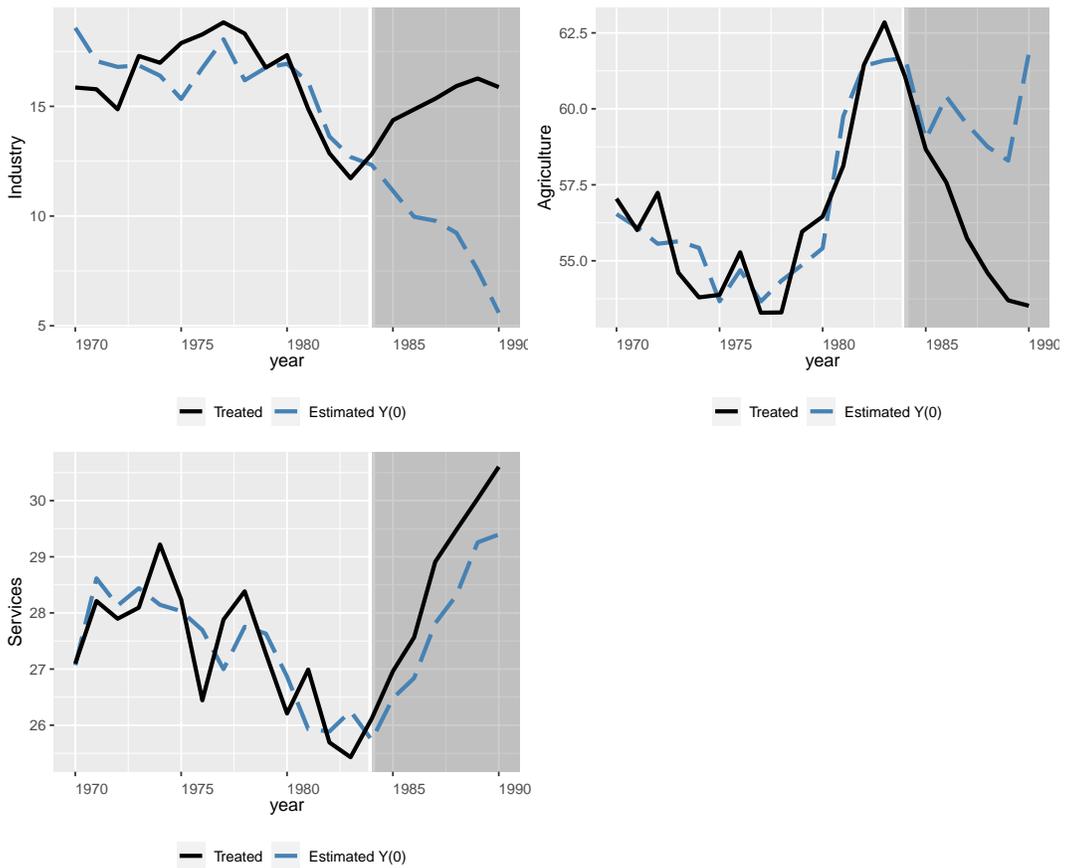
Figure 4.6: Value Added Share of Industry, Agriculture and Services



The grey area is the post treatment period

Rodrik (2016) presents literature’s explanation for why value-added and employment shares of industry have remained low in developing countries like Ghana, while employment and value-added shares of services have been high and rising. One explanation is simply that the increased demand for services as consumer preferences move from goods to services influences the structural composition of both sectors. Also, industrial sectors like manufacturing are typically more productive than other sectors, and this results in lower employment shares in these sectors as long as the elasticity of substitution between sectors is less than one.

Figure 4.7a: Employment Share of Industry, Agriculture and Services in Ghana

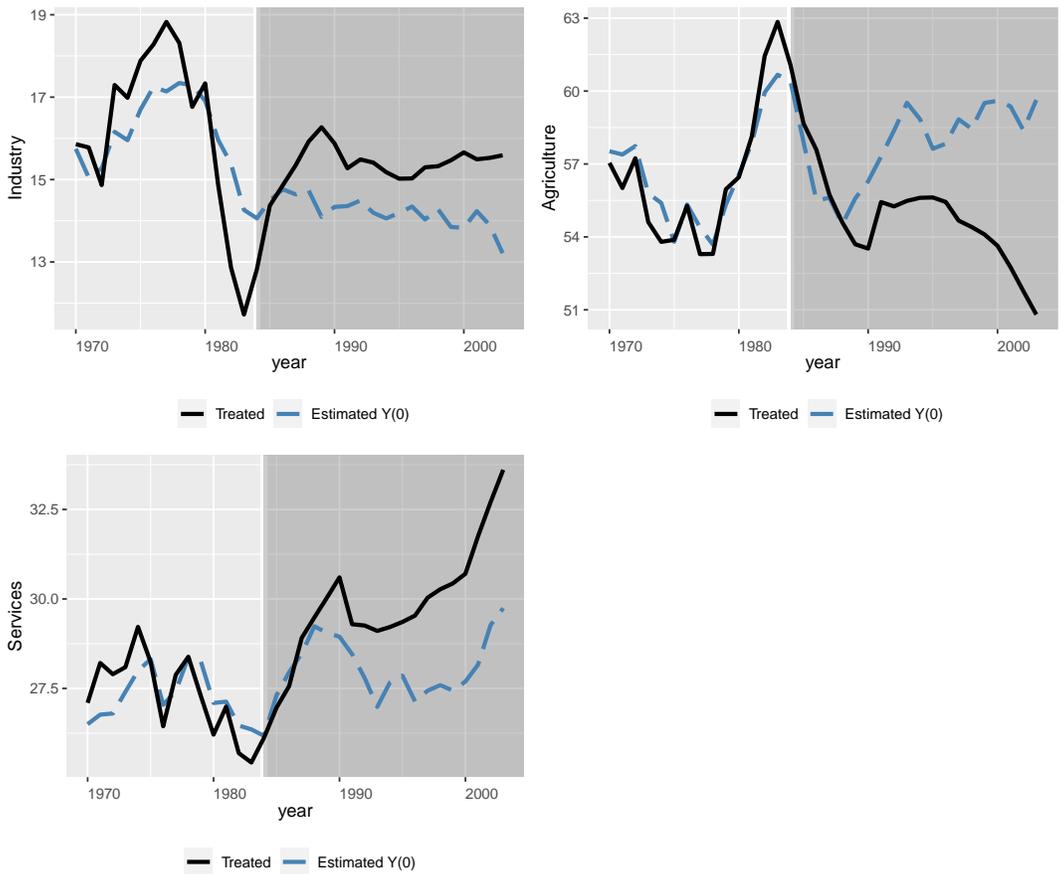


The grey area is the post treatment period

For panel B the variables used are GDP per capita growth, Population growth,

Life expectancy, Total persons engaged in the labour force, Fertility rate, Real domestic absorption at constant 2011 USD, Domestic credit to the private sector, Agricultural land (in sq km), Land area, Livestock Production index, Food Production Index, Total summed magnitudes of all (societal and interstate) major episodes of political violence.

Figure 4.7b: Employment Share of Industry, Agriculture and Services in Ghana



The grey area is the post treatment period

## 4.6 Conclusion

Ghana, like most African countries, has a pattern of structural change that is different from the expected pattern for economic growth. Even though Ghana

has experienced economic growth in recent decades, there are concerns about the sustainability of such growth given the structure of the economy (Jedwab and Osei, 2012). In this chapter, I find that trade liberalisation may have been what caused the pattern of structural change that has been observed in Africa for the last few decades. African countries have structural change that is not growth enhancing as in the process of structural change resources move from agriculture towards services instead of to industry which is the way to cause growth convergence (Rodrik 2016).

Although trade liberalisation may have been good for other countries in encouraging growth-enhancing structural change like the UK and South Korea (Teignier, 2018), it has not worked for Africa and has had an unexpected effect. Policies or solutions that are one size fits all will never work for all. In approaching the policy conversation for African countries, it may be better to take more time to understand the current structure and why it is the way it is in order to get a better policy solution. When the world bank pushed trade liberalisation in the 1980s if they had taken just a little time to understand that the mechanisms for industrial growth were not in place, and if they had maybe focused more on instituting the right mechanisms, maybe trade liberalisation would have worked in a better way for African economies.

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## Appendix

**Table 4A.1**

Variable Source	Observed Control Variables
Penn World Tables	Real GDP at constant 2011 USD (in Millions) ,Real capital stock in constant 2011 USD (i n millions), Real domestic absorption in constant 2011 USD (in millions), Number of persons engaged (in millions)
World Bank World Development index	GDP per capita (constant 2010 USD), Agricultural land (sq. km), GDP per capita (constant 2010 USD), GDP per capita growth (annual %), Population, total, Population growth (annual %), Livestock production index (2004-2006=100), Life expectancy at birth, total (years), Land area (sq. km), Food production index (2004-2006 = 100), Fertility rate, total (births per woman), Agricultural land (% of land area)
Groningen Growth and Development Centre 10 Sector Database	Employment share of agriculture, Employment share of industry, Employment share of services

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Variable Source	Observed Control Variables
UN Data	Gross value added share of agriculture, Gross value added share of industry, Gross value added share of services
Center for Systemic Peace Polity IV data	Total summed magnitudes of all societal and interstate episoded of political violence

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## 5 Conclusion

This thesis provides insight into the economic history of African economies. Also, it explores the structure of African economies and explains why structural change in Africa has the pattern that it does.

### 5.1 Summary of findings

Chapter two shows that the current understanding of African economies is incomplete. Contrary to the common findings in development economics literature, African economies have not only experienced a lack of growth, but these economies have had periods of growth and decline. The literature often depicts African countries as only having experienced economic decline<sup>5</sup>. This chapter, therefore, provides new insight into the historical economy of African economies by estimating GDP per capita for 16 African countries. In most of those economies, production and export of agricultural goods was the main driver of economic growth. Valuable insight from these results is that African countries are not just poor of economies that do not grow but that they have failed to grow fast enough to catch up with the rest of the world. Answering the question of why this is the case should be the focus of research into these economies. Some of the reasons posited for why African countries are slow-growing include the effects of colonialism, poor governance and high incidence of diseases (see Table 2A.2). Chapters three and four tries to answer the question that chapter two presents; Why is Africa slow-growing? These chapters focus on the impact of international trade on the labour markets and the structures of African economies. Therefore, they answer the question by exploring how it is that most African countries have not been able to catch up with the rest of the world even though they joined the international trade market decades ago.

Put differently, other economies in the world have experienced so much growth

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<sup>5</sup>One example is the paper by Collier and Gunning (1999)

as to catch up with and surpass African economic growth (see figure 2A.1). Chapter three, therefore explores the structure of the labour market to understand why this is the case. Self-employment in Africa as in other developing countries is so much higher than that of developed countries (Table 3.8). This chapter studies how trade openness has impacted the rate of self-employment. Trade literature finds that as a country becomes more open to trade, workers move towards the more formal sectors. However, this chapter finds that how trade impacts the movement of labour between sectors depends on the degree of labour market rigidity. A country's labour market needs to be flexible enough to be able to cause a beneficial change in the structure of its labour market from opening up to trade. Therefore, a country with a more rigid labour market may experience the unintended consequences of unemployment push self employment after opening up to trade unless they improve the labour market institutions. These findings support the literature on the importance of having the appropriate institutions in place for economic growth. Although international trade is considered as essential for economic growth, it may not have the desired results if the appropriate institutions are not in place.

The next chapter of the thesis focuses on the pattern of structural change that most African countries have and how trade liberalisation has impacted this pattern. Structural change in Africa is not growth-enhancing (McMillan and Rodrik, 2011). For African countries, the process of structural change is one that has not included industrialisation in a meaningful way. That is to say, in the process of economic growth, the growth and development of the industrial sector have been substandard even though the industrial sector is vital for income convergence (Rodrik, 2013). Chapter four, therefore uses GSC and Ghana as a case study to show how structural change in Africa may have looked like if trade liberalisation did not occur. The analysis finds that Ghana would have followed a more regular and growth-enhancing pattern of structural change if trade liberalisation did not occur when it did. One hypothesis about the reason for this is the timing of trade liberalisation (Giavazzi and Tabellini, 2005; Billmeier and Nannicini, 2013). By the time African economies joined the world market, it was already too late to enjoy all the benefits of trade.

Just like in the third chapter, it may have been more critical to create the appropriate institutions and structures necessary for economic growth than liberalising trade when they did. Trade liberalisation was done in response to economic troubles and encouraged strongly by the world bank in the structural adjustment programmes. This was a hasty response to the economic problems that they were facing. A more thought-through approach that accounts for the structure of the economy and the institutions that are in place would probably have been better. That would have put African economies in a better position to open up to international competition with countries that have more established trade markets and strong institutions. The findings of this thesis support the literature on the importance of good institutions for economic growth.

## **5.2 Considerations for future research**

This thesis provides two considerations for future research on international trade in African economies.

Chapter two provides direction for future research on African economies. When trying to understand the poor growth performance of African economies, researchers need to include an analysis of their economic history as this will help them ask the right questions. This chapter presents estimates of GDP per capita that are reliable and accessible for researchers so that when studying African economies, their analysis need not be limited to just the post-liberalisation period but can go as far back as the 1800s for some countries. Future research on African countries should focus on why these countries failed to grow as fast as the rest of the world. What are the factors that may have led to the slow economic progress that is common for African nations? This chapter begins to tackle this question by providing some hypothesis. One possible reason is the economic history of colonisation coupled with their long history of being ravaged by Europeans, whose main goal on the continent was to extract resources. However, these hypotheses must be tested by future research, and more hypotheses should be provided.

Chapter three and four show that policies for growth that have worked for other countries may not necessarily be beneficial for African countries and may harm their prospects for sustainable economic growth. There needs to be more research into how international trade and globalisation has affected the different areas of African economies. These countries are relatively new to the trade market as independent nations, so it will be useful to understand precisely how international trade has impacted all the different areas. It will particularly be useful to have a breakdown of specifically how trade impacted the industrial sector in Africa. The industrial sector is the least significant in GDP for most African nations, and it will be useful to have an analysis of how this sector changed after trade liberalisation.

In conclusion, this thesis finds that African economies have not always been slow-growing and weak, but historical GDP figures show that they have experienced economic progress in the past. However, in trying to improve the economic position of developing African countries, it is vital to consider their history without which there is the danger of drawing the wrong conclusions about them and recommending inappropriate policies. Also, international trade may have the unanticipated impact of causing the wrong kind of structural change and labour market composition in Africa. It is, therefore, crucial to ensure that African countries are first put in a position to benefit from good policies like international trade before embarking on them.

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