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Analisi Dell'impatto Del Commercio Estero Sulla Crescita Economica:

Il Caso Dell'Africa.

ANALYSIS OF THE IMPACT OF FOREIGN TRADE ON ECONOMIC GROWTH:

THE CASE STUDY OF AFRICA.

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DEDICATION

This thesis is dedicated to my beloved father,

May his memory forever be a comfort and a blessing.

He was the best father a child could have.

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List of Abbreviations

ADI	-	Africa Development Indicators
AfDB	-	African Development Bank
AGOA	-	African Growth Opportunity Act
C.V:	**-**	Coefficient of Variation
EU:	-	European Union
EXPY:	**-**	Export sophistication index
FDI:	-	Foreign Direct Investment
IMPY:	**-**	Import sophistication index
IMF:	-	International Monetary Fund
GDP:	-	Gross Domestic Product
Ln:	**-**	Natural Logarithm
NICs:	-	Newly Industrialized Countries
OECD:	-	Organization for Economic Co-operation and Development
OLS:	-	Ordinary Least Squares
Pop:	-	Population
SSA	-	Sub-Saharan Africa
SNA	-	Social network analysis
UNCTAD:	-	United Nations Conference on Trade and Development
USA:	-	United States of America
WDI	-	World Development Indicator
WTO:	-	World Trade Organization

ABSTRACT

The importance of foreign trade for countries' growth and peoples' well-being is one of the main open issues in the academic and political debate, not only in Africa but worldwide.

The purpose of this study is to test the link between the composition of African countries' foreign trade in terms of specialization in the export and import of sophisticated goods and economic growth from 1996 to 2020. In other words, we want to detect whether the specialization of African countries in the export and import of highly sophisticated goods can increase their GDP per capita, and thus boost economic growth. The findings of this study will determine the effects of international trade sophistication on economic growth to the policymakers. To examine this relationship, an Ordinary Least squares (OLS) estimation on the First Difference of the model was used. This model is taken through the Heteroskedasticity test. Secondary data were used to conduct this study and the required data were collected from the WDI. Empirical investigation reveals that EXPY which measures the productivity level associated with a country's exports basket is positively and significantly related to GDP per capita while IMPY which measures the average income associated with a country's imports basket is negatively and significantly related to GDP per capita. This study recommends that African countries should improve and strengthen the competitiveness of their export sector by producing and exporting more sophisticated manufacturing products (which, according to the OECD and the WTO, directly or indirectly create more than 30% of the value-added) than primary ones; with the aim of striving for a balance with the import sector and ensuring the welfare of the population.

Keywords: Foreign trade; Economic growth; Africa.

ASTRATTO

L'importanza del commercio estero per la crescita dei paesi e il benessere delle popolazioni è una delle principali discussioni aperte nel dibattito accademico e politico, non solo in Africa ma in tutto il mondo. Lo scopo di questo studio è testare il legame tra la composizione del commercio estero dei paesi africani in termini di specializzazione nell'esportazione e importazione di beni sofisticati e la crescita economica dal 1996 al 2020. In altre parole, vogliamo rilevare se la specializzazione dei paesi africani nell'esportazione e nell'importazione di beni altamente sofisticati può aumentare il loro PIL pro capite, e quindi favorire la crescita economica. I risultati di questo studio determineranno gli effetti della sofisticazione del commercio internazionale sulla crescita economica per i responsabili politici. Al fine di esaminare questa relazione, è stato utilizzato un Estimatore di differenze prime. Questo modello è stato validato attraverso il test di eteroskedasticità. I dati secondari sono stati utilizzati per condurre questo studio e i dati richiesti sono stati raccolti dal WDI. L'indagine empirica rivela che, EXPY che misura il livello di produttività associato al paniere di esportazioni di un paese è positivamente e significativamente correlato al PIL pro capite mentre IMPY che misura il reddito medio associato al paniere di importazioni di un paese è negativamente e significativamente correlato al PIL pro capite. Questo studio raccomanda ai paesi africani di migliorare e rafforzare la competitività del loro settore di esportazione, producendo ed esportando più manufatti ad alta sofisticazione (che, secondo l'OCSE e l'OMC, creano direttamente o indirettamente più del 30% del valore aggiunto) che prodotti primari; con l'obiettivo di cercare un equilibrio con il settore delle importazioni e garantire il benessere della popolazione.

Parole chiave: Commercio estero; crescita economica; Africa.

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CHAPTER ONE

INTRODUCTION

Economic growth, which is usually referred to as the level of increase of a country's productive capacity measured by comparing Gross National Product in different years. Economic growth is considered as the most crucial indicator that is released since it helps in reducing countries' poverty, as it gives investors the actual background of how a particular country is faring in the economy (Market Realist, 2015).

Since 2009, the world has been trying to recover from the great recession that occurred between 2007 and 2009. Although the economies of most developed countries have recovered, economic growth rates remain low in most developing countries, particularly those in Africa.

Between 2008 and the end of the global recession in 2009, Sub-Sahara African countries' GDP growth rate declined by more than 2.11 percent; from 5.29 percent in 2008 to 3.18 percent in 2009 (World Bank data, 2020). According to the World Bank (2017), the world economy was expected to recover fairly from the low rate of 1.15 percent in 2016 to 2.43 percent in 2017. As of July 2017, the global economy appeared to have recovered to 3 percent (IMF Blog, 2017). These rational numbers show that countries have adopted economic policies that have helped boost their Gross Domestic Product, resulting in economic growth and a recovery in the global economy.

During the recovery period from the Great Recession, countries engaged in cross-border trade, which, according to the literature, has proven to be one of the most important components of economic growth. International trade, that is the transfer of goods and services, information,

capital, technologies across borders from one nation to another, accounts for a significant share of countries' Gross Domestic Product (GDP).

International trade which can be traced back to Adam Smith (1776) in the book of '*The Wealth of Nations'*, believed that productivity, division of labor, and free markets can lead to the (absolute advantage) increase in a country's national income and output levels than those countries with less productivity due to the degree of division of labor.

Although David Ricardo (1817) later expanded the theory by adding technology in which he argued that national output exists due to comparative advantage in which a country produces commodities at a lesser cost known as "opportunity cost" than other countries with less national output.

It is from these two classical economists that emerged the relationship between economic growth and international trade; about which countries started specializing in selling commodities in exchange for money in-order to increase their national economic scale.

According to Carbaugh (2005), exports and imports have been strongly recommended by the standard economic theory as the substance for economic growth. (Hausmann. et al, 2007) went further saying that the export of sophisticated goods positively impacts the economic growth of countries. Consequently, the gains from globalization and international trade depend on the ability of countries to appropriately position their exports basket on a high-quality spectrum.

Economists tend to agree that international trade without barriers leads to GDP growth (Economy watch, 2010). Therefore, an assumption can be made that international trade and economic growth are correlated. A country with an open economy is more privileged to fast economic growth than a country with a closed economy. Although international trade might be dangerous due to war and

political aspects, it is advantageous to those countries that are participating in it (Smith, 1776). Smith believes that trade increases growth, especially trade that crosses borders because it encourages and increases productivity.

Foreign trade has proven to be beneficial for countries that are active in trade, as they become more productive than countries that only produce for their domestic market. An economy that is globalized according to Adam Smith enhances the participation of the countries in the world market, therefore, leading to market expansion and openness of the market. To some extent, this statement has proven to be true from the experience of developing countries such as China and India. Since the implementation and initiation of the "Open Door Policy," China has been the targeted global market in the world; both developed and developing countries are interested in engaging in trade relations with it.

China has become productive not only for its foreign trade market but also for its domestic local market. The economy of China has experienced dramatic growth due to trade flows. Not only has China benefited from foreign trade economically as the country has experienced a high growth rate in GDP, but China has also experienced a huge inflow of hard currency which makes the country have the biggest account of foreign reserves and employment. China is ranked number 2 after the United States on global rank in trade value (World Trade Organization, 2016). Although this might not be the case for many African countries in which apart from being a WTO member and practicing foreign trade for years, their economic profile continues to be referred to as erratic.

Africa, and particularly Sub-Saharan Africa is the area of the continent of Africa located in the south of the Sahara. Its economy is largely based on agriculture, exports of primary commodities

such as petroleum, coco, banana, coffee, and cotton, and a net import of manufactured products including machinery and medical products.

Although there is a good backing on the theoretical consensus on the impact that foreign trade has on the level of economic growth, some empirical results from other countries show some great deal of contradiction on the relationship between GDP, exports, imports, Gross capital formation, and foreign Direct investment. Therefore, making the relationship between the mentioned variables in conflict (World Economic Outlook, 2015, 6).

Bokosi (2015) conducted research in which he examined the validity of the export-led growth hypothesis with an aim of establishing the relationship between exports and economic growth. The study showed that export-led growth, especially that which is driven by primary commodities negatively affects economic growth and went on to establish that there was no long-run relationship between exports and economic growth.

The study also suggested that agriculturally based economy states are more disadvantaged from foreign trade than the industrialized states, with a loaded human capital. Empirical findings of these and other studies, therefore, create serious doubt about the validity of foreign trade causing economic growth hypothesis in so many countries around the world.

This raises the still unresolved question of whether or not foreign trade accelerates economic growth, particularly in Africa.

1.1 Problem Statement

Africa since the second world war has been a champion of foreign trade. The continent's economic growth and development policies have always promoted foreign trade. Export and import promotion have largely been the continent's strategy of achieving economic prosperity. Even if it faced some limited imports during the 1960s to 1970s (World Bank,2022).

Nevertheless, the rapid increase in exports and imports annually has not matched with the steady economic growth rate. While foreign trade has been on the increase, Africa's GDP growth rate has been erratic and stagnant frequently, characterized by serious fluctuations (World Bank, 2022). This, therefore, makes it difficult to patch the foreign trade-nexus economic growth in Africa.

1.2 Research Objectives

The main objective of this research is to test the link between the composition of African countries' foreign trade in terms of specialization in the export and import of sophisticated goods and economic growth from 1996 to 2020.

In other words, we want to detect whether the specialization of African countries in the export and import of highly sophisticated goods can increase their GDP per capita, and thus boost economic growth.

To be able to achieve the main objective of the research, the study will analyze the specific objectives below:

- Determine the effects of EXPY on per capita income in Africa.
- Determine the effects of IMPY on per capita income in Africa.
- Identify the problem associated with economic growth and finally suggest necessary recommendations associated with the problem of economic growth in this part of the world.

1.3 Limitation and Scope of The Study

This study is an analysis of the impact of African foreign trade in terms of goods specialization pattern at import and export on economic growth from 1996 to 2020. Therefore, making the study at a continental' level analysis.

The main limitation is that there is no empirical strategy to detect the causal link between trade sophistication and growth in Africa; nonetheless, this study aims at exploring the relationship between the two to discuss some policy implications.

In pursuit of this objective, the contribution of other important factors to the continent's growth process will be assessed such as foreign direct investment net inflow, gross capital formation public and private sector, population.

The scope of the study in the analysis of the results is however limited to quantitative analysis of the aggregate contribution of foreign trade to Africa's economic growth.

Although the study used a bit of qualitative technique in exploring the world's literature, the study is mainly confined to Africa because of the researcher's familiarity with Africa's economy, its development, and trade policies. Socio-economic structure including Africa's long history in foreign trade also played a key role in choosing this study area.

1.4 Significance of The Study

Given the immense benefits that countries can derive from trade flows, this research will aim to test the nexus between foreign trade in terms of import and export goods sophistication and economic growth in Africa, as foreign trade is a key rapid growth tool for economic development.

This study will therefore contribute to the existing research in this area of foreign trade; just that, this time, the study will take the expected angle of the link between foreign trade sophistication and economic growth.

The angle that the research takes, even though it has been addressed previously from other angles by several researchers, the literature seems to lack a comparative analysis of foreign trade's sophistication and economic growth in Africa. Consequently, the research is timely in filling the gap in empirical knowledge that has existed. The research will also attempt to analyze the previous literature and contribute to the limitations of the previous research; thus, it will contribute to addressing the gaps that have existed in the previous literature.

1.5 Research Methodology

The research design of this paper will be quantitative. A multiple regression analysis using an indicated software will be used to examine the relationship between GDPs per capita and export and import of sophisticated goods for the period 1996 to 2020. These findings will be discussed in Chapter five.

The dependent variable to be used in this research is the GDP per capita in constant 2015 US dollars to represent the economic growth.

Aggregates are the export sophistication index (EXPY), import sophistication index (IMPY).

Some variables of control have been also included; there are Foreign direct investment net inflow % of GDP (FDI), along with labor represented by population and capital represented by gross capital formation.

A heteroskedasticity test will be carried out before, to determine which model between a First Difference Estimator or a panel effect(Fix or Random Model) will be suitable in explaining our data.

The aim is to detect if there is a nexus between Africa's foreign trade composition in terms of import and export of sophisticated goods and economic growth, by employing the variables that are most suitable to execute such research.

1.6 Research Hypothesis

- H0: There is a relationship between foreign trade and GDP per capita in Africa.

- H1: There is no relationship between foreign trade and GDP per capita in Africa.

1.7 Structure of The Thesis

The study is arranged in the outlined structure below.

Chapter One: Introduces the study by presenting the study's contextual background. From this, the study builds up a research problem statement and justification that translates to the research objectives, research hypothesis, and research question.

Chapter Two: Tends to give and analyses the relationship between foreign trade and economic growth as discussed and explored by some of the major economic theories. This is followed by critical analysis on foreign trade on several schools of thought and development of the theoretical framework the study employs. The chapter will finish with a review of literature on the empirical studies that were previously conducted on foreign trade and economic growth in various countries including African countries.

Chapter Three: Gives an overview of Africa's Foreign Trade and Economic growth.

Chapter Four: Renders the detailed account of the research methodology that the study has followed, the analysis of data, and different variables.

Chapter Five: Presents the research findings, the discussion of the results, and the limitation of the econometric model used.

Chapter Six: Presents the main conclusion of the study and policy recommendation drawn from the study.

CHAPTER TWO

LITERATURE REVIEW

Nowadays, all evidence shows that the world is divided into two. On one side we have the developed countries and on the other side, we have the underdeveloped countries or the developing countries. A lot of efforts are made by these underdeveloped countries in terms of poverty reduction. However, it must be noted that this evolution varies from one continent to another. Among these developing countries, some are seeing their growth situation improve like some Asian countries (China, India...) and South American countries (Brazil, Mexico...) which are experiencing economic development and relative enrichment of their inhabitants while others are still in extreme poverty, like Cameroon and many African countries. This leads us to ask the following questions:

What is the origin of economic growth? What would explain this glaring gap between economically rich and poor countries? What is at the origin of the growth of new emerging countries like China? What are the developed countries doing that the poor countries are not doing to achieve exceptional economic growth, to improve the standard of living of their populations in a sustained manner, and to free themselves from the rut of poverty?

To answer these questions, several works have been carried out by schools of economic thought.

In the following paragraphs, we will focus on the theoretical analysis of the determinants of economic growth as elaborated by the different schools of economic thought. We will also dwell on the empirical works on this vibrant subject that is economic growth and finally, we will present the limits of the different models.

2.1 The Origin Of Economic Growth And Reasons Of The Gap Between Economically Rich And Poor Countries.

In the theoretical analysis, economic growth depended only on the factor capital and labor. Classical authors such as Adam Smith (1776) and David Ricardo (1817) present economic growth as resulting from an accumulation of capital, in other words, from the number of instruments produced at the disposal of workers. However, one of them namely Thomas Malthus (1766) shares a pessimistic long-term vision, namely that growth is destined to disappear progressively and to be canceled out in a stationary state due to population growth and the decreasing yield of the land.

This prediction of the stationary state evoked by some classics will be taken up by the Neoclassicals following the example of R. Solow (1956), who developed a model in which he also explained that the accumulation of capital and labor are at the origin of growth. Indeed, two major predictions follow from the Solow model:

- He envisages the catching up of developed countries by less developed countries: the Convergence
- He evokes that due to the decreasing returns of the factors of production, economies will reach a point where any increase in the factors of production will no longer generate an increase in production; this is also the stationary state that some classics spoke of, following the example of Thomas Malthus (1766).

Solow noted, however, that this prediction of a stationary state is unrealistic, citing the fact that economies never reach a stationary state because of technical progress, which increases the productivity of the factors of production and thus makes it possible to counteract the decrease in factor returns and thus the stationary state. In this Solow model, the technical progress to which

the author refers as a fundamental source of the increase in per capita income in the long term is exogenous, meaning it is independent of economic activity. They, therefore, seem to "fall from the sky" because there is no precision on their origins.

In 1980, Paul Romer developed an economic model that endogenizes technical progress, contrary to the Neoclassicals; based on the hypothesis that growth generates technical progress by itself. In other words, technical progress is both a cause and consequence of growth.

Thus, there is no longer a fatality of diminishing returns. Investment in the sources of technical progress, like innovation through property rights and patents, research and development, knowledge/education, and the establishment of a strong and efficient government institution, systematically produce positive externalities that allow for increasing returns to scale leading to long-term economic growth.

The endogenous growth thesis, although similar to exogenous growth in many aspects or inspired by the Solow model, challenges the Neo-classical liberal theory of economic convergence, which means that the poor countries are well on their way to achieving faster economic growth than the rich countries, which in the long run will see their per capita income decline because of decreasing returns to scale. According to contemporary economists (Paul Romer,1980), growth is cumulative and self-sustaining. Thus, economies will not tend towards a stationary state. They demonstrate that logically it is the most advanced countries that have better chances to continue to progress; because according to them, growth calls for growth and, it is necessary to have economic growth to obtain more growth *(page 11, The Origins of Endogenous Growth -1994).*

To demonstrate this fact, Paul M. Romer in the article entitled *" The Origins of Endogenous Growth,1994"*, starts from this question: "Why is that the poor countries as a group are not catching up with the rich countries in the same way?

He demonstrates through relatively logical reasoning in this article first how Neoclassicals, mainly R. Solow, obtained an erroneous result on convergence by considering the value of technologies exogenous and identical in all countries: the convergence controversy. And then in a second part, he proposes a viable alternative for the perfect competition model.

The example Paul M. Romer gives is that of the United States and the Philippines in the mid-20th century. The author shows us in this article that using the traditional interpretations of the Cobb-Douglas model (1928), it is not possible to explain the contradictory histories between the countries. The calculation shows that the American worker is much more productive and implies that the Filipino worker works with relatively less capital per worker. However, this is misleading because the variable A (the value of technology) used in the calculation is the same in both countries. This is not true because empirically the United States and the Philippines did not have the same A(technology) value in the mid-20th century.

Paul Romer (1994, p7) therefore proposes a spillover effect to explain why the standard Cobb-Douglas formulation is ineffective in explaining productivity at the transnational level. This spillover effect takes into account the knowledge transfers that occur through the widespread use of technology. Romer highlights that innovation (from technical progress and research) is an activity with increasing returns that increases the stock of knowledge, and the spillover of this knowledge ends up being beneficial to all, instead of being limited to the innovative firm. Firms are then interdependent. Thus, the "race to innovate" of each firm benefits all firms and pulls the

economy towards growth. Barro and Sala i Martin (1995) also explore knowledge transfer. They note that this knowledge spillover effect would be much more important with capital mobility.

The Neo-Schumpeterian theory also makes the link between growth and technical progress/innovations, drawing on the endogenous model. According to them, technical progress is the engine of economic growth. Innovation allows firms/entrepreneurs to place themselves in a situation of temporary monopoly (imperfect competition), to obtain lower production costs, and to make a surplus profit (*page 14, " The Origins of Endogenous Growth, Winter 1994").*

This being said, we obviously notice that technical progress has a fundamental role in economic development. Through them, structural change economists have changed their paradigm in the 1960s and 1970s, defining economic growth as a mechanism of structural transformation during which the productive structure modernizes and migrates from traditional production to diversified industrial production (Kuznets, 1973; Chenery, 1981). Decades later, this definition has not changed. Dutt et al (2008, p.28) consider that "economic growth is basically structural transformation that involves the production and export of new goods with new technologies and the transfer of resources from traditional activities to these new activities". This structural transformation involves diversification and modernization. Diversification is presented by (Chandra et al, 2007) as a strategy that allows developing countries that export mainly primary products (with low productivity), to evolve towards a modern economy where several varieties of goods are produced. They continue their analysis by affirming that an effective diversification in terms of impact on economic development must be done towards more sophisticated goods, meaning goods with high productivity. Thus, countries, especially those with low per capita incomes, should be concerned about what to produce and to which market to export them. The question of the sophistication of export goods, which refers to the monetary value that a country

manages to obtain from the products it produces and exports to a foreign market, therefore, seems to be addressed.

Hausmann et al, (2007) argue that not all goods have the same impact on economic performance. They show that some goods are associated with higher incomes; these so-called "rich" goods are indeed exported by high-income countries, such as the US. In other words, to become rich, poor countries should produce what rich countries export (Carrere et al, 2010). Thus, in the article, the authors state that "countries become what they produce".

In a table (page 12, Table 3), they rank the products according to their PRODY: productivity; and it emerges from there that the products with a low PRODY tend to be raw materials that are generally exported by Sub-Saharan African countries like Cameroon; on the other hand, the products with a high PRODY are observed in countries with a high per capita income like Luxembourg; thus affirming that the pattern of specialization of the countries is strongly linked to the per capita income. Countries with low per capita income tend to specialize in the production and export of natural resources and a small number of products: these are generally the countries of Sub-Saharan Africa, such as Cameroon, as mentioned above, whereas countries with high per capita income specialize in the production of high-productivity goods (manufactured products), such as the United States. This more or less refers to the theory of factor endowments which stipulates that each country should specialize in the production and exchange of goods for which it has abundant factors of production (Heckscher, Ohlin, Samuelson, 1919-1933-1941).

However, what would justify the case of China, which with a low per capita income and an abundant labor force (human capital), has managed to impose itself in international trade through specialization in the export of products with relatively high productivity? According to Hausmann.

et al, (2007, p14), the EXPY (productivity level associated with a country's specialization), China's relatively high export performance is because, in addition to specializing in sophisticated products, it has also diversified its exports. Thus, it is not just specialization that counts, but the sophistication and diversification of products at export and import that contribute to the economic development of these emerging countries. Chinese producers, in addition to raw materials, produce and export human and physical capital-intensive products, which until now have generally been considered as belonging to the field of specialization of rich countries.

Gordon H. Hanson (2012, p52) states that between 1994 and 2008, "China and India alone accounted for more than 25% of absorption of export growth of middle-income economies in raw materials and electronics". He goes on to say that "China and India are distinct among low and other middle-countries for being reliant on high-income markets to absorb their ever-growing exports. High-income countries absorbed over 70 percent of China's and India's export growth in apparel, footwear, and other manufactures and over 55 percent in electronics which is one of China's strengths and metals for India.

However, what would justify China's success in exporting a wide range of sophisticated products given its level of development?

According to Hausmann. et al, (2007, p23), China's economic growth stems from the transfer of resources from low revenue/productivity activities to high productivity products identified by an entrepreneurial process of cost discovery, not associating it with comparative advantages.

Rodrik (2006) and Easterly and Reshef (2009) explain the origin of hyper-specialization saying that it comes from production externalities which consist to lower costs for other firms through knowledge spillovers or through pecuniary externalities associated with making inputs available at a lower cost.

Gordon (2012) challenges this hypothesis by saying that it is not obvious why externalities should be important in the export of primary commodities.

According to Gordon (2012), China's investment in education (human capital) and technology, the attraction of FDI (mainly inflow), the improvement of transport and communication infrastructure have more or less enabled it to achieve an exceptional comparative advantage in the export of manufactured goods. Hence its economic growth.

2.2 How Poor Countries Can Achieve Economic Growth?

First of all, we must establish the difference between emerging countries, newly industrialized countries, and less developed countries.

The LDCs (Least Developed Countries) are poor countries with an essentially agrarian production, with a low level of development. There are mainly sub-Saharan African countries. As an example, Cameroon.

On the other hand, the NICs (Newly Industrialized Countries) are countries in the process of catching up economically and in full industrialization, with an intermediate standard of living and development, for example, South Africa.

Emerging countries are countries whose GDP per capita is lower than that of developed countries, but which are experiencing rapid economic growth, and whose standard of living as well as economic and social structures are converging towards those of developed countries with an economic opening to the rest of the world, large-scale structural and institutional transformations, and strong growth potential. For example, India, China.

These different types of countries have an opposite insertion in international trade. Between 1948 and 2005, while the share of the NICs and China in world trade rose from 4% to more than 16%, Africa's share fell from 7.3% to 2.8%. We are witnessing a very strong marginalization of LDCs in world trade, their share falling from 1% in 1970 to 0.3% in 2005. (Philippe Deubel,2008).

Endowed with abundant natural resources, such as oil, most LDCs continue to follow a classic strategy of specialization in the export of these primary products: natural resources, agricultural products, etc. The financial resources derived from these exports are used to import capital goods to promote the industrialization of the country.

However, this strategy is proving to be increasingly ruinous for many countries specialized in mono-product, due to the deterioration of the terms of trade, the high volatility of the prices of primary products as well as the competition and protectionist practices of the countries of the North which make this development process unstable.

Unlike the least developed countries, the emerging countries have managed to diversify their economy by specializing in the production and export of a wide range of relatively high productivity products (natural resources and manufactured goods) as mentioned above in the case of China.

LDCs are involved in international trade only through their imports, which certainly increases their openness, but the openness measured by the ratio of their imports (not exports) to their GDP shows a rate of dependence on international trade. Thus, LDCs are largely subject to international trade when they participate in it. Hence their trade balance deficits.

The principles of the Neoclassical theory of comparative advantage, therefore, probably do not guarantee the economic success of the least developed countries in international trade.

Other empirical studies, however, reveal rather positive conclusions regarding the economic growth and the opening of less developed countries to international trade.

Keller (2000) argued that a developing country stands to gain more in terms of both the product that it can import and the direct knowledge it can acquire from a developed country than it would import from another developing country. This implies that importing a new (or better) type of intermediate goods will increase the degree of specialization in the production of other products. One example, which is sighted in this respect, is the import of crude fertilizer, which constitutes high-technology imports from developed countries to developing countries. This is a transfer of foreign technology that helps to increase productivity in the agricultural sector.

Additionally, (Lopez, 2006) provided empirical evidence that suggests that those who participate in international trade are more likely to survive than those not involved in international trade, given that it forces domestic firms to improve their efficiency. The strong competitiveness and the spillovers generated by technological progress embodied in imports may favor the innovation of new products and processes in the domestic economy. These technological spillovers improve efficiency and consequently enhance growth (Amiti and Konings, 2007).

All evidence shows that the determinants of economic development can have different impacts from one country to another, from one continent to another. However, it is imperative to understand that certain factors such as the diversification of exports through the production and export of a wide range of sophisticated goods contribute to the increase in per capita income leading to economic growth. Therefore, it is this pattern of economic diversification and sophistication that Sub-Saharan African countries or generally African countries should adopt in combination with other growth-enhancing factors such as: innovation, research, and development, building strong

government institutions, constructing transport and communication infrastructure, and encouraging foreign direct investment, although this is very contradictory in economic literature.

CHAPTER THREE

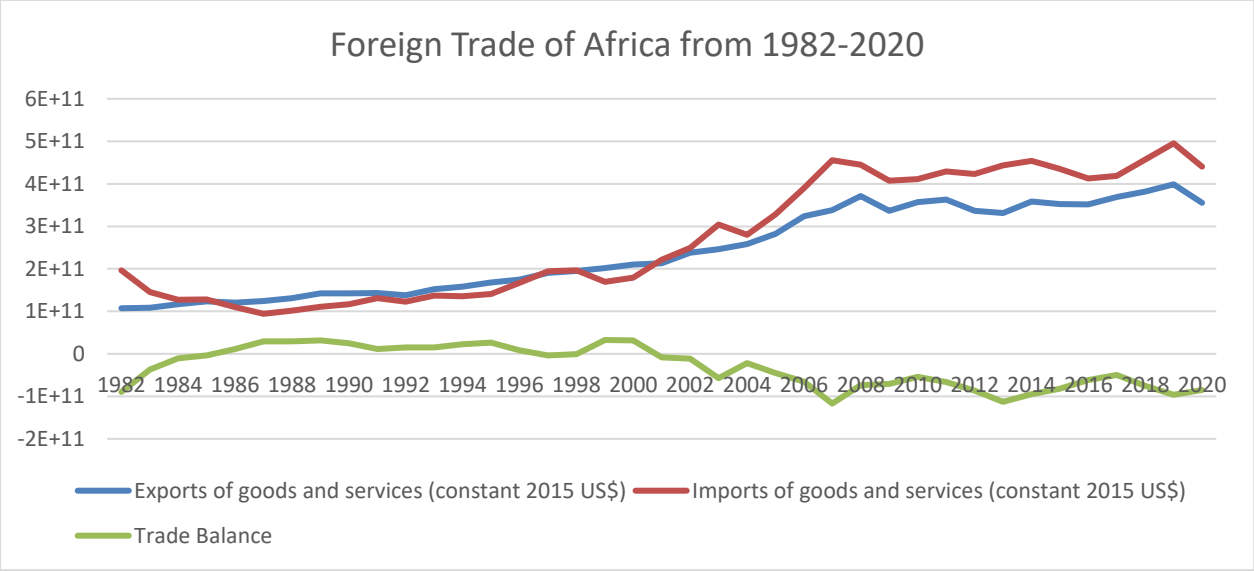
OVERVIEW OF AFRICA'S FOREIGN TRADE AND ECONOMIC GROWTH.

3.1. Overview of Africa's Foreign Trade

The end of colonialism in the 1960s had unleashed new energies and hopes in Africa. The leaders of these new states were determined that their countries should catch up with the developed countries and become integrated into world trade.

Fifty years after gaining independence, unlike the Asian emerging countries (China, India), most African countries particularly those of south of the Sahara are excluded from the advanced economic poles of the planet and seem to be watching from the sidelines this race to which their world does not belong. Africa does not seem to be sufficiently integrated into the globalization process. It has a tiny share in world trade (about 2%, IMF 2016).

Figure1: *Foreign trade of Africa 1982-2020*



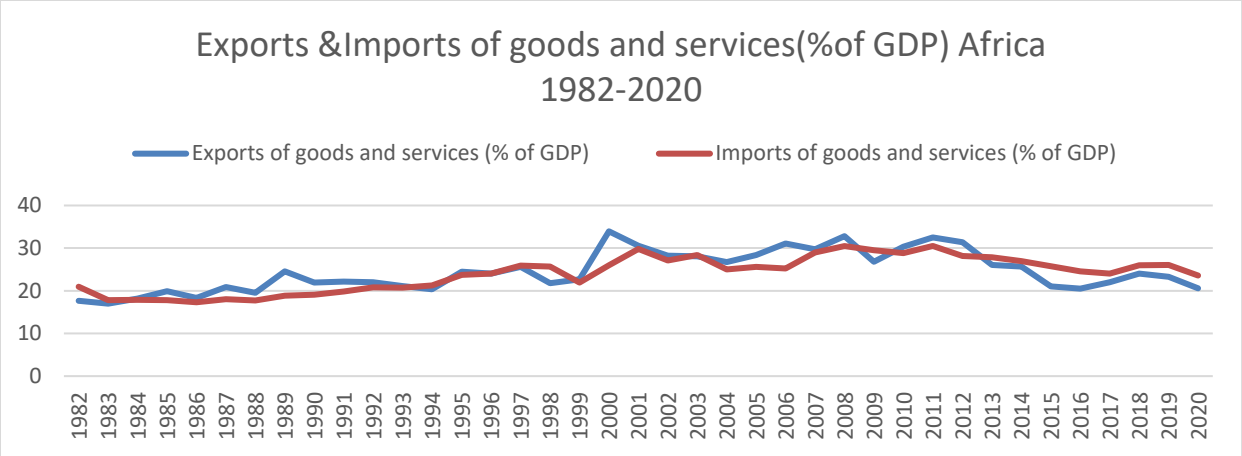
Source: WDI

According to graph1 above, during the last decades, particularly between 1986 and early 2000, Africa's exports have grown considerably more than its imports, allowing it to achieve a trade surplus. However, from the beginning of the year 2000, it began to experience a sharp decline in exports in favor of an acute increase in imports. Hence the deficit balance of trade observed until today.

For example, in 2017, Ethiopian exports accounted for $3,170 million compared to $16,280 million in imports. Agricultural products accounted for 40 percent of exports, the share of oil and mining products exported was 35 percent. The same scenario is observed in several other African countries.

According to Roger Blein (1943), this loss of influence of Africa, particularly of sub-Saharan Africa, is due to a combination of factors: the weakness of its national and regional markets, which deprives it of the learning necessary to conquer external markets; its specialization on a few agricultural or mining products; the persistence of structural handicaps such as technological delays, the weakness of innovation, the often unstable or unfavorable nature of public policies to investment; the scarcity of public or private investment flows due to political instability, the lack of infrastructures, the regular decrease of raw material prices on the international market.

Figure2: *Exports&Imports of goods and services (%of GDP) African countries1982-2020*



Source: WDI

Despite the deficit observed in most of the African countries' trade balance over time, we can notice from this graph above that the share of exports contributing to GDP is relatively much higher (with the peak in 2000-2001) than that of imports.

Hence the urgent need for these countries to restructure their production structure by investing more in exports of high value-added goods and limiting imports, which do not contribute much to economic growth.

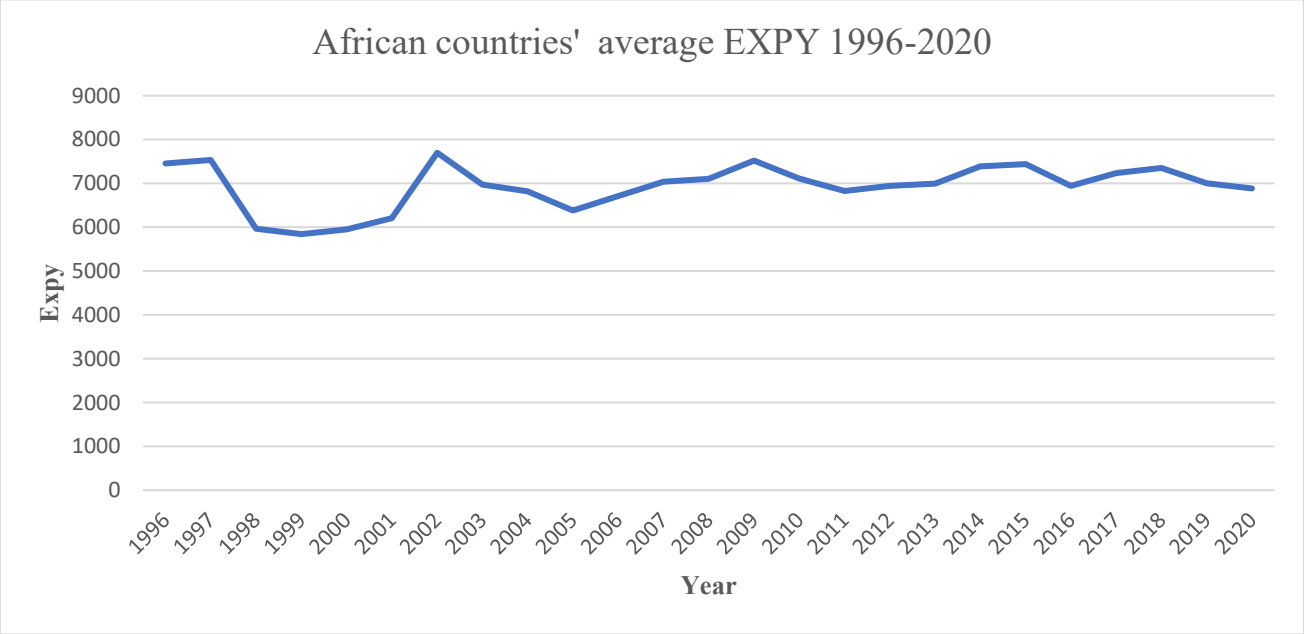
3.1.1 African countries export sophistication index evolution 1996-2020

The sophistication of a country's production (and exports) is really important for its economic transformation, as the sophistication of production and exports is typically associated with higher productivity, which in turn can lead to higher wages and incomes and improved welfare.

Taking into account export data for African countries from 1996 to 2020, the Hausman et al. (2007) EXPY index was used to construct the African countries ' EXPY which captures the income level associated with their exports basket.

It is important to mention that countries specializing in the export of technology-intensive products, branded and high-quality products and processing goods have a high EXPY while those specializing in the export of commodities have a low EXPY. Therefore, the higher the EXPY, the higher the country's export income.

Figure3: *African countries' average EXPY 1996-2020*



Source: BACI database and WDI. Computation by Prof. Alessia Lo Turco.

An analysis of EXPY within individual African countries shows that in 1996, Algeria had the highest average EXPY value when its exports consisted primarily of petroleum and gas(92.91% of total exports).

Second in terms of highest EXPY value was the Gambia, Which approximately 73% of exports were composed of vegetables (53.23%), animals(12.24%), and metals(7.20%).

Senegal had the third-highest EXPY value in 1996, exporting mainly Chemicals (36.81%) and Fuels (22.48%).

2002 represents the period in which African countries reach a peak in terms of income level associated with their exports basket as it can be seen in the chart.

South Africa strongly contributed to that highest value of EXPY by exporting these high-value products: Automobiles (US$ 1,368,261.12 million); Filtering or purifying machinery and apparatus (US$ 916,848.22 million). Indeed, its exports were mainly composed of pieces of machinery (11.46%), metals(17.50%), and Fuel(12.12%). It is one of the African countries that stands out in terms of economic growth so far in the continent.

It is followed by Algeria which mostly exported Fuels (96.85%) and finally Eswatini which exported mostly chemicals (42.%); textiles(19.72%) and wood(9.91%).

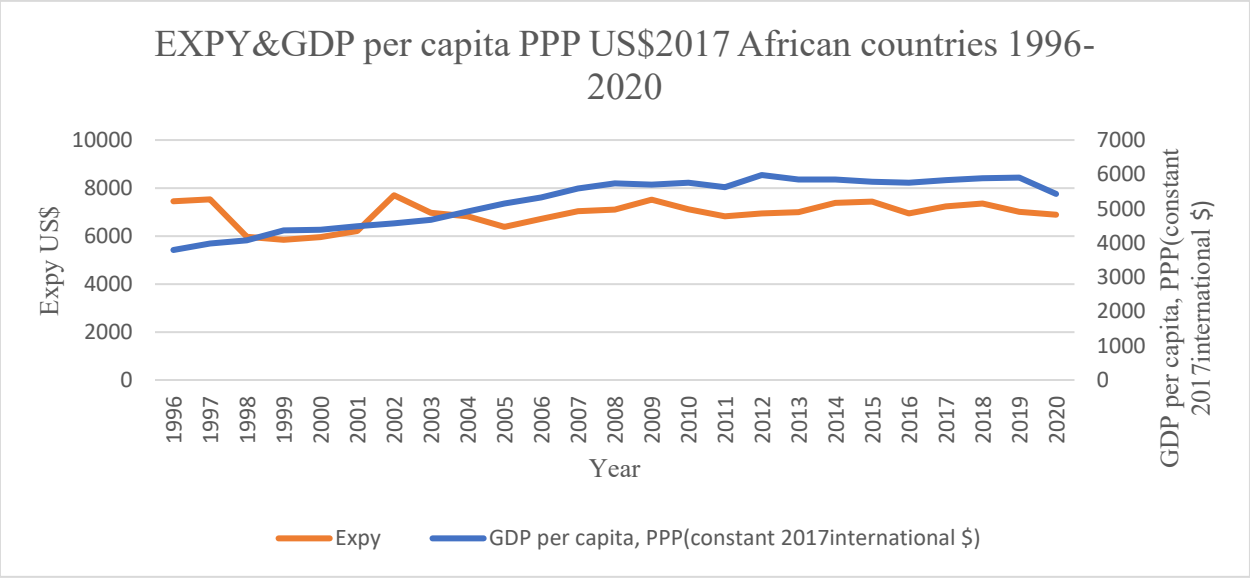
It is clear that the EXPY of African countries over time was mainly determined by commodities and not high value-added products like sophisticated manufacturing products. In 2009, Algeria still had one of the highest EXPY by exporting "Fuels (98.34%)". The next two countries in terms of EXPY ranking, Congo, Rep, and Nigeria, were still dependent on commodity exports: Fuels (70.66%) and (90.36%) respectively. Sudan showed the biggest improvement over the years with

an EXPY increasing from US$ 2961 in 1999 to US $12608 in 2008. However, exports' composition is still based mainly on primary products.

Cameroon's EXPY has not significantly increased over the years; from US $9658 in 2000 to US $10077 in 2018. Exports were mainly composed of raw material (54.89%) and intermediate goods (28.40%).

Indeed, it can be noted that the level of income associated with the export basket of African countries has been relatively constant and very low over the years, despite the increasing trend. The fluctuation is not significant between years. This implies that these countries have had little or no experience in transforming their export sector from primary products to more diversified and highly sophisticated products, that can bring significant added value.

***Figure 4**: Evolution of EXPY and GDP per capita PPP US$2017 African countries 1996-2020*



Source: WDI

The figure above shows the comparison between the EXPY of African countries and their GDP per capita, PPP US$2017 over the years. It appears that the EXPY of African countries (which varies on average from $7699.33 to $5842.04), already very low compared to that observed in rich countries, is significantly higher than the GDP per capita, PPP US$2017 (varies on average from $5979.88 to $3792.41). This reflects the degree of inequality in terms of income distribution observed in African society moreover, the difficulty for these countries to set up an effective political and economic system that encourages citizens to actively participate in the wealth creation process that will sustainably improve their standard of living.

According to ADI, (2008-2009); Africa accounts for a large share of the world's people living in absolute poverty. Indeed, close to 50% of the population in Sub-Saharan Africa lives on less than US$ 1 a day, which constitutes the highest rate of extreme poverty in the world.

3.1.2 African countries import sophistication index evolution 1996-2020

Import sophistication is an important index to measure the income level associated with a country's imports basket and the technical content of its imported goods.

In this study, the formulation of the IMPY is similar to that of the export sophistication index developed by Hausman et al. (2007).

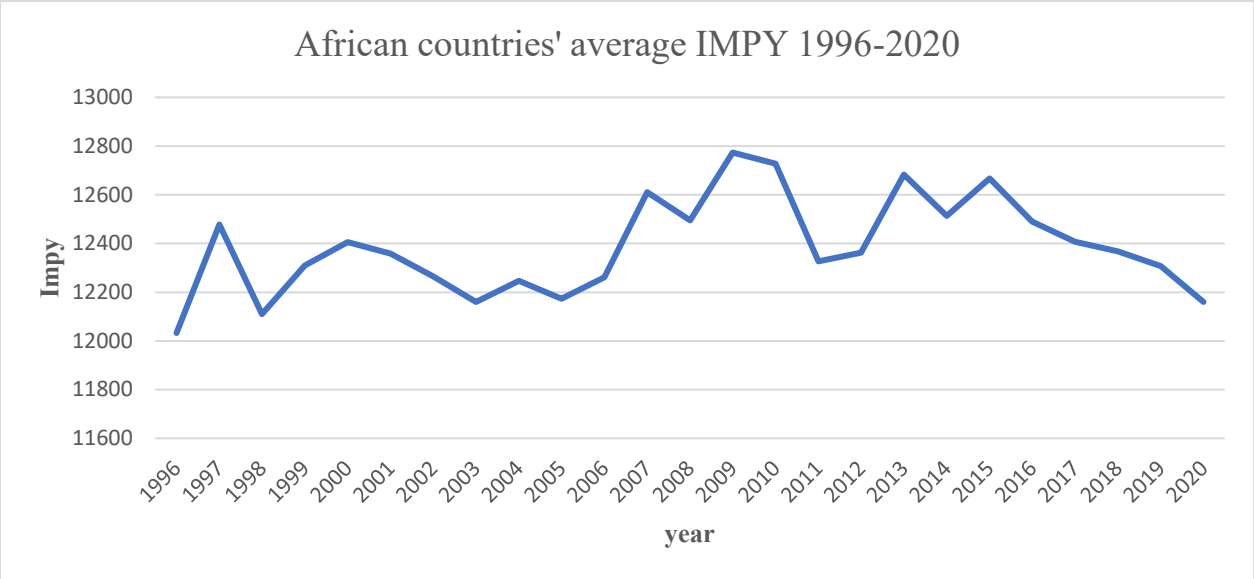
Indeed, for each country (j), we obtained the level of sophistication associated with its imports from the region (r) (IMPYjr or simply IMPY).

The level of sophistication of the country (j)'s imports from a region (r) (IMPY) is a function of the nature of imported goods (the value of their IPRODY) and their share in total imports. So, IPRODY captures the income level of the imported goods.

Similarly, to EXPY, countries for which imports are more concentrated in high IPRODY products will have a higher IMPY (they will be more likely to be exposed to foreign knowledge).

The chart below shows us the evolution of IMPY in African countries over the years.

Figure 5: *African countries' average IMPY 1996-2020*



Source: BACI database and WDI. Computation by Prof. Alessia Lo Turco.

We can clearly see that the IMPY of African countries is higher than their EXPY. According to Chen Xiaohua et al (2021), the import of highly sophisticated goods will have negative effects on capital accumulation and human resources in R&D in the manufacturing sector mainly, leading a country to a greater dependence on foreign intermediate goods, capital goods, and consumer goods.

Indeed, despite many fluctuations observed in the graph, the IMPY of African countries has tended to increase over the years. There is a sharp increase between 2005 and 2009, with a peak in 2009. The top three countries that contributed to this highest IMPY value during this period are:

a. Congo Republic (IMPY US$ 17486,2009)

This country of sub-Saharan Africa has distinguished itself during this period by importing mainly capital goods (US$ 3,308 million, product share of 74.40%); consumer goods (US$ 606 million, product share of 13.62% of total import); Imports of intermediate goods amounted to $374 million, representing 8.42% of total imports.

The top five imported HS 6-digit level products from the world by Congo, Rep. along with trade value in that period was:

- Floating or submersible drilling or production, worth US$ 1,581,911.97 million.
- Cargo vessels and other vessels for the transport, worth US$ 795,293.16 million.
- Floating docks, worth US$ 328,130.44 million.
- Petroleum oils, etc., (excl. crude); preparation, worth US$ 98,121.21 million.
- Portland cement (excl. white), worth US$ 69,413.93 million.

b. Zimbabwe (IMPY US$ 15465,2009)

Zimbabwe was characterized by high imports of consumer goods (68.33% of total imports, or US$3,908 million). Imports of capital goods accounted for US$741 million, or 12.96% of total imports, and imports of intermediate goods for US$697 million, or 12.18% of total imports.

The top five imported HS 6-digit level products from the world by Zimbabwe along with trade value between 2005-2009 were:

- Medicaments of other hormones, for retail sale, worth US$ 2,749,726.65 million.
- Petroleum oils, etc., (excl. crude); preparation, worth US$ 327,084.47 million.

- Diesel-powered trucks with a GVW not exceeding, worth US$ 123,190.28 million.
- Sunflower seed and safflower oil (excl. crude), worth US$ 95,051.34 million.
- Maize (excl. seed), worth US$ 81,800.75 million

c. South Africa (IMPY US$ 14720, 2009)

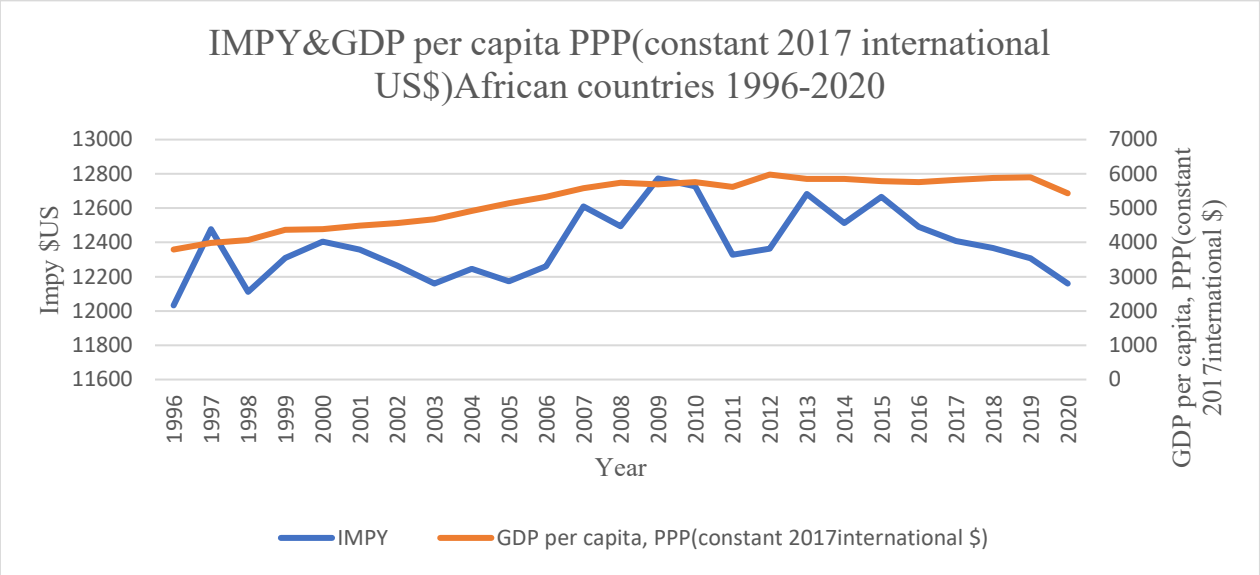
South Africa stood out from the other countries by importing large amounts of capital goods ($19,877 million, or 31.17 percent), consumer goods ($17,350 million, or 27.21 percent), and intermediate goods ($10,499 million, or 16.46 percent).

South Africa Raw materials imports were also relatively high in that period (US$ 12,523 million, product share of 19.64%).

The top five imported HS 6-digit level products from the world by South Africa along with trade value between 2005-2009 were:

- Petroleum oils and oils, worth US$ 10,294,417.99 million.
- Petroleum oils, etc., (excl. crude); preparation , worth US$ 2,462,559.39 million.
- Automobiles with a reciprocating piston engine, worth US$ 1,240,365.35 million.
- Transmission apparatus, worth US$ 1,166,630.53 million.
- Other medicaments of mixed or unmixed products, worth US$ 974,805.65 million.

Figure 6: *Evolution of IMPY and GDP per capita PPP US$2017 African countries 1996-2020*



Source: WDI

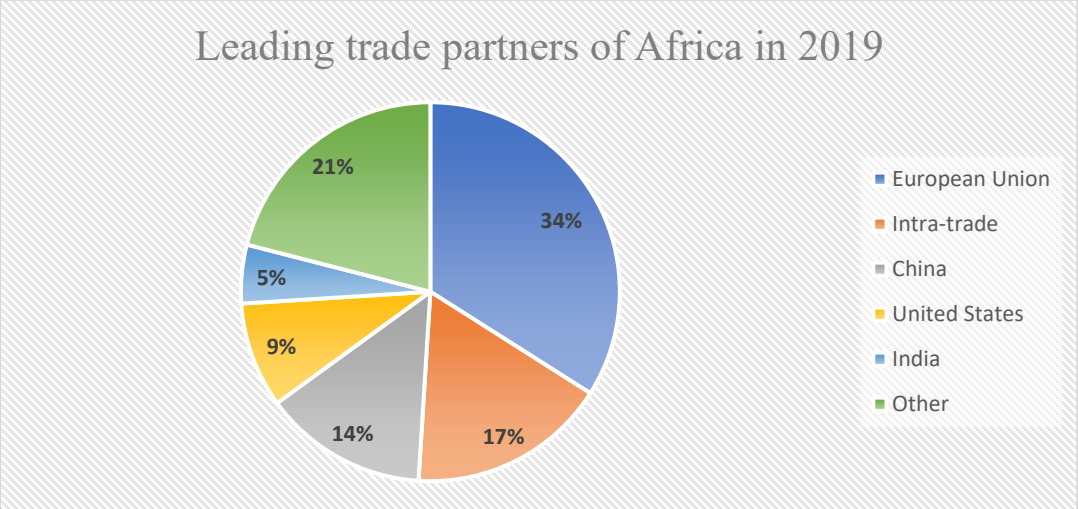
It is clear from the above chart and analysis that many of the capital, intermediate, and consumer goods that African countries import are much more sophisticated (in terms of technical content, quality, and packaging) than their level of development and industrialization. This means that African countries' dependence on foreign goods is higher than normal.

As mentioned earlier, these countries have long relied on the strategy of promoting the export of primary goods and importing goods for which they lack the capacity and knowledge to produce (mainly capital goods). Indeed, this strategy of importing capital goods, intermediate goods or highly sophisticated consumer goods may not necessarily promote sustainable economic growth in African countries. Hence the deficit observed in their trade balance and their difficulty in achieving sustainable and significant growth so far.

3.1.3 Africa's Foreign Trade Partners

Services such as transport, tourism, manufacturing industry have a low percentage in contributing to the GDP in many countries in Africa. These sectors have been neglected through the years with little improvement from different governments. This is because the economy of these countries is largely based on agriculture, which does not even allow for food self-sufficiency. For this reason, they are forced to import goods that they cannot produce enough or do not produce at all for domestic use. The top trade partners of exports and imports of Africa have changed with the percentage, but many countries of the continent have managed to maintain most of their frequent trading partners through the years.

Figure 7: *Leading trade partners of Africa in 2019*



Source: Statista

In 2019, Africa's second-largest trading partner, after the EU, has been China, with which the continent trades massively (as it can be seen from the above chart); United States come in third position thanks to the African Growth Opportunity Act (AGOA), which allows sub-Saharan

African countries especially to export their products to the United States without paying customs duties.

It is important to mention that, in 1995, trade between China and the African continent was only $3 billion. In 2017, trade was $143 billion, creating a progressive trade dependency.

In Angola, 40% of commercial exchanges are with China (mostly imports). China is Cameroon's main trading partner in terms of imports and exports as well.

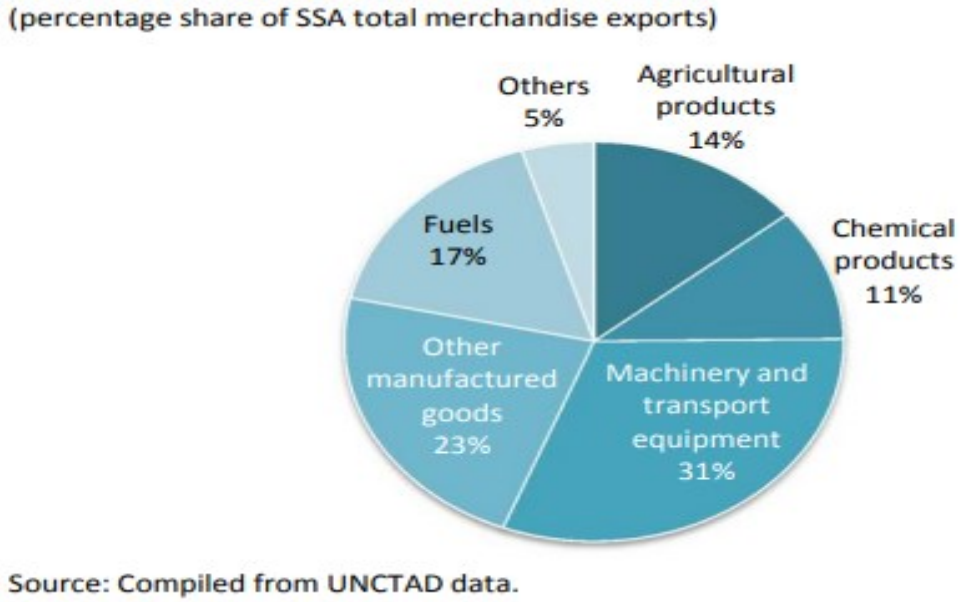
African countries are therefore dependent on imports from China and the EU, reinforcing a very negative trade balance and economic dependence.

3.1.4 Africa's mains Import and Export products

Most African countries buy technological equipment, machine tools, weapons, cars, etc., which are products for which they largely lack the technology and capability to produce. They also import cereals and certain food products such as milk and meat from their trading partners.

The graph below shows the main products imported by Sub-Saharan Africa in 2014.

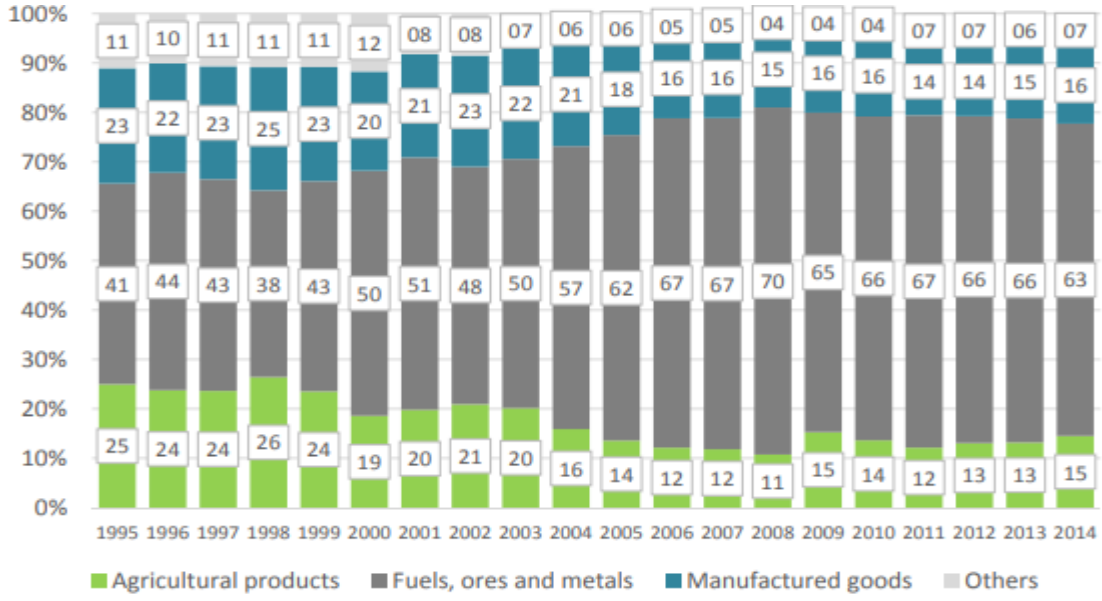
Figure 8: *African countries imported product groups,2014*



The top 9 of the largest African importing countries are South Africa, Egypt, Morocco, Algeria, Kenya, Angola, Libya, Togo, Ghana.

Indeed, as it can be seen in the chart, Africa imports in majority machinery and transport equipment, manufactured products and agricultural products, mainly basic cereals and certain food products (milk, meat,) from North 'countries. Cereal imports, which were very low in 1960 (only one million tons per year), have reached more than 10 million tons out of consumption of 60 million tons in 1997. Africa's dependence on the outside world in the majority for its food has thus increased very rapidly and alarmingly. Moreover, the importation of manufactured goods from North countries also accentuates Africa's dependence on these countries and does not encourage the development of local human capital and human resources in research and development; especially in the sector of technology and artificial intelligence, which represents the future of the world.

Figure 9: *SSA major Export product groups,2014 (percentage share of total exports products)*



Source: Compiled from UNCTAD data.

For what concerns main exports, the table above represents the evolution of the main export products of African countries from 1995 to 2014. Thus, it appears obvious as mentioned previously that crude oil represents more than half of the exports of these countries; about 56.2% of total exports. This is followed by manufactured goods at about 21.3% and agricultural products at about 17.5%.

Indeed, Africa's exports are estimated to account for 2.1% of total world exports in 2020. The 5 largest African exporting nations are South Africa, Nigeria, Morocco, Egypt, Angola; generated 52.9% of the continent's total exports in value(worldtopexports,2022).

In reality, except for some North African countries and South Africa, African economies are primarily based on two things:

- Traditional agriculture as mentioned above, is largely subsistence, with low yields. 70% of the African population derives most of its income from this underperforming agriculture.
- The industry, which produces only consumer goods and little or no capital goods. It produces only a small share of the industrial products that the continent consumes and does not participate in the global market significantly.

Already very poorly industrialized, Africa, especially sub-Saharan Africa, is undergoing a process of deindustrialization. The continent is becoming a factory graveyard. Throughout their history, African companies have played only a marginal role in world markets. Today, finding an African manufactured product in a Western country remains difficult, just as finding an African manufactured product in Africa!

On the other hand, it is easier to find products “made in” other continents in large quantities. In Africa, when people have money, they do not invest in the industry but in agriculture, real estate, or trade. The continent is not transforming its natural resources into more sophisticated goods that can add more value to the economy.

3.2. Overview of Africa Economic Growth

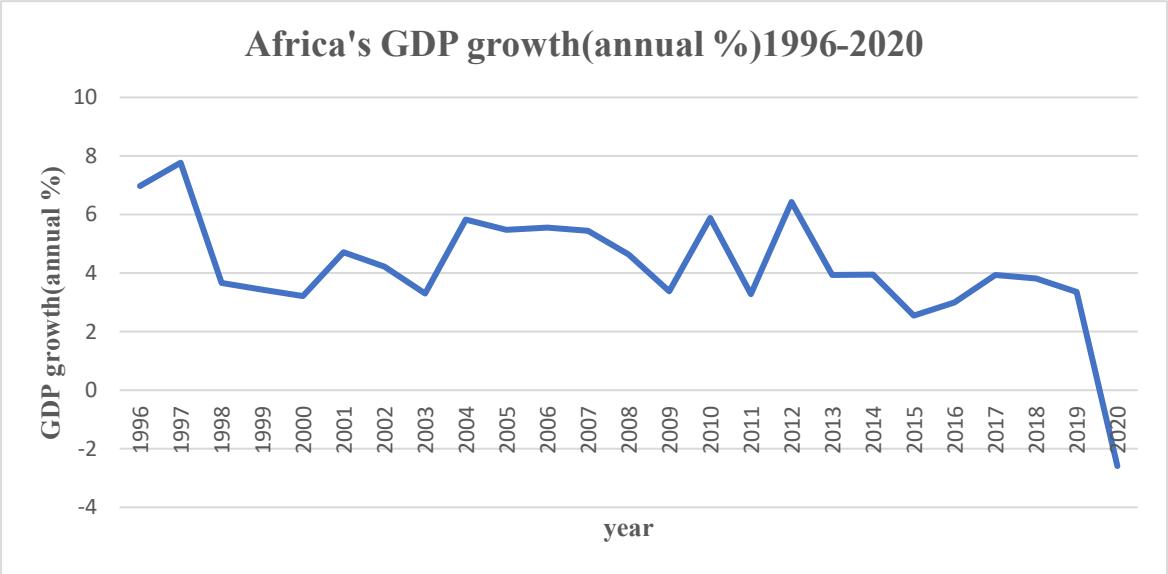
As mentioned before, Africa is the least developed and least advanced continent in the world. The economic situation is improving but still raises the question, in a context of strong demographic growth, of its capacity to cope with the increase in mass unemployment and underemployment.

Indeed, over the last two decades, Africa has experienced relatively low economic growth despite some improvements. African economic growth averaged 4% per year over the 2008-2011 period. At the sub-regional level, South Africa and the Maghreb countries are more prosperous than the countries of Central Africa and West Africa.

In 2019, East Africa achieved the highest growth (5%), followed by North Africa (4.1%) and West Africa (3.7%). Central Africa, meanwhile, recorded growth of 3.2%, while the weakest performance was achieved by Southern Africa with 0.7% (compared to 1.2% in 2018), due in particular to the slowdown of the South African economy, coupled with the recent devastation of cyclones Idai and Kenneth.

Although stable, this growth rate in 2019, is below the ten-year average of 5% for the region. The slow growth is partly due to the moderate expansion of the continent's big five countries: Algeria, Egypt, Morocco, Nigeria, and South Africa, which jointly averaged 3.1 percent growth, compared to an average of about 3.40 percent for the rest of the continent (AfDB,2019).

Figure 10: *Africa 's GDP growth (annual %)1996-2020*



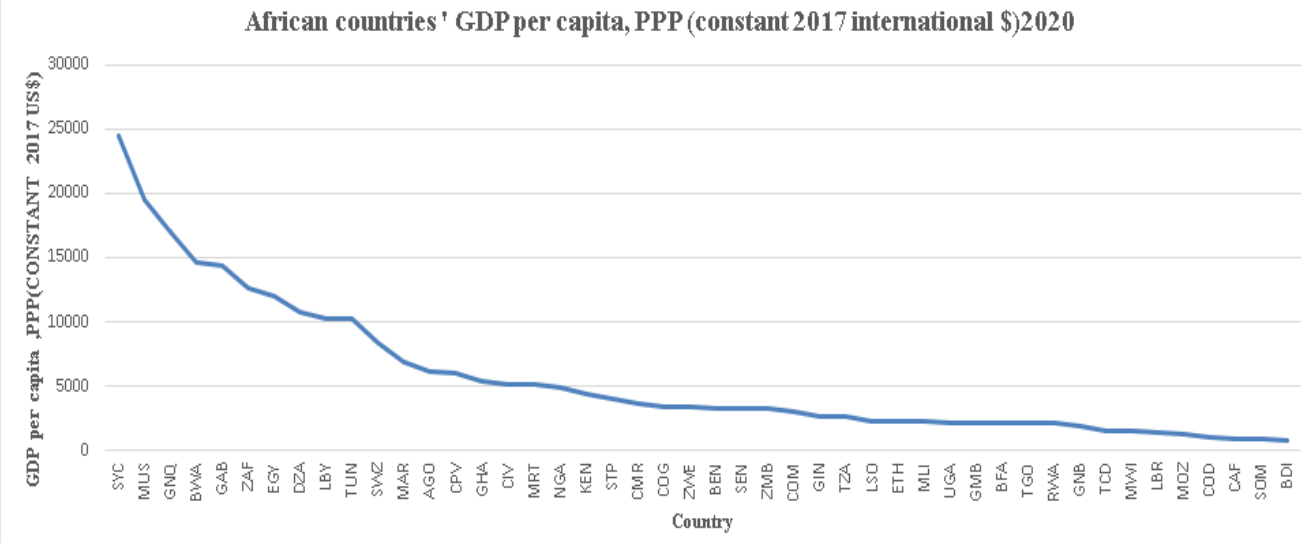
Source: WDI

The figure shows the evolution of Africa's GDP growth rate between 1996 and 2020. Economic performance between 2004-2007 was impressive, with average growth exceeding 5%. Sub-Saharan Africa, recorded a particularly high average growth rate of 5.6%, compared with 4.5% for North Africa.

Since 2008, the global economy has been under significant pressure, which has affected growth in all regions. However, in the middle of this global turmoil, domestic supply shocks, and civil strife, Africa has shown resilience despite some fluctuations in the graph. Thus, between 2008 and 2011, a period of great global uncertainty, the African economy grew by more than 4%, which is more than Latin America and the Caribbean (3.4%) and Europe and Central Asia (0.2%). (However, its expansion has been half as fast as that of the East Asia and Pacific region, which has benefited from China's continued growth. Thus, it can be said that Africa has resisted the effects of the global economic crisis better than in previous episodes.

In 2011, riots related to the Arab Spring slowed growth in North Africa and dragged down growth on the African continent as a whole, which fell to 3.4 percent from 5 percent in 2010. Nevertheless, in 2012, growth recovered strongly in North Africa to about 10%, bringing the continent's growth back up to nearly 7% as observed in the figure above. Between 2013 and 2020 Africa's economic growth rate remained relatively low, at less than 4%, on average, with a huge drop in 2020 probably due to COVID-19.

. **Figure 11**: *African countries' GDP per capita, PPP(constant 2017international $)2020*



Source: WDI

Although real GDP growth has been more or less sustained as observed in the previous graph, in terms of per capita income, Africa is still lagging behind other regions. Namely: Asia, the Pacific, and Latin America.

Most of the African countries have a GDP per capita in PPP terms of less than US$5,000, and those above this threshold are either oil or mineral exporters or diversified economies (Botswana, Mauritius, Gabon, Equatorial Guinea, Cape Verde, Egypt, Morocco, Tunisia, South Africa, and Seychelles).

Indeed, while Africa has 17% of the world's population and 18% of the world's land area, it produces only 3% of the world's nominal GDP or 2.3% in PPP terms (IMF, 2021).

It is predicted that Africa's economic growth will continue to be accompanied by high population growth, which is a good driver of GDP growth, but constitutes an obstacle to increasing GDP per capita and therefore a drag on development in the case that it is not sufficiently educated and prepared to create wealth, boost economic growth. (Ionel Zamfir,2016).

CHAPTER FOUR

METHODOLOGY AND DATA ANALYSIS

To carry out this study and to verify all the hypotheses formulated, the following tools were used: descriptive analysis, and econometric analysis. The literature review provided a general understanding of the main determinants of economic growth and the assessment of their impact on economic growth. After analyzing the literature review to identify the main variables to be included in our model, we selected a sample of variables likely to influence and have a significant impact on economic growth in Africa.

We used descriptive analysis to diagnose the economy and foreign trade of African countries. In other words, at this level, we are interested in the behavior and main characteristics of the variables studied. To better capture the information in the data and to better guide our exploratory analysis, we conducted two types of descriptive analysis. The univariate descriptive analysis on each variable used in the model and the multivariate descriptive analysis to study the probable correlations between the variables.

Then, the econometric analysis allowed us to scientifically detect and validate the link between the main variables, namely: the export sophistication index, the import sophistication index, and economic growth in Africa. Indeed, given the objectives and the nature of the data, the First Difference Estimator by running an Ordinary Least squares (OLS) estimation on the first differences of the model could be sufficient in explaining the data. There is no need to apply the pannel(fixed or random)effect. The heteroskedasticity test confirmed that further in the analysis.

4.1 Empirical Model

The model to be estimated is in the form of a linear combination between the variables.

This is presented in the following general form:

$\Delta(\ln)y_{it} = f(\Delta\ln(y_{it-1}), \Delta\ln(expy_{it}), \Delta\ln(impy_{it}), \Delta\ln(pop_{it}); \Delta\ln(fdi_{it}), \Delta\ln(K_{pr}/GDP_{it}), \Delta\ln(K_{pu\,it})$.

The linear form is presented by this equation:

$$\Delta\ln(y_{it}) = \Delta\ln(y_{it-1})\,\beta_0 + \Delta\ln(expy_{it})\,\beta_1 + \Delta\ln(impy_{it})\,\beta_2 + \Delta\ln(pop_{it})\,\beta 3 + \Delta\ln(fdi_{it})\beta_4 + \Delta\ln(k_{pr}/GDP_{it})\,\beta_5 + \Delta\ln(k_{pu\,it})\,\beta_6 + \varepsilon_{it}$$

Where:

i=1,2….54 represents countries

t: the period from 1996 to 2020.

β-i, i= 0 to 6 are real parameters.

y: GDP per capita in constant 2015 US dollars

K_{pr}/GDP: Gross fixed capital formation, private sector (% of GDP)

K_{pu}: Gross fixed capital formation public sector (constant 2015 US$)

ε_{it}: error term

We will therefore dwell on the results obtained by this model to test the link between African countries 'foreign trade composition in terms of specialization in the export and import of highly sophisticated goods and economic growth.

4.2 **Definition and Analysis of Different Variables**

The dependent variable or explained variable(y) is the GDP per capita in constant 2015 US dollars (GDPKPC2015$). This variable measures the change in wealth created in a given country over a given period (generally one year) per individual.

The independent or explanatory variables used to estimate the model are in total two, namely: Country's Export sophistication index (EXPY) which is the level of income/productivity that corresponds to a country's export basket, and Country's import sophistication index (IMPY) explained as the level of income/productivity that corresponds to a country's import basket.

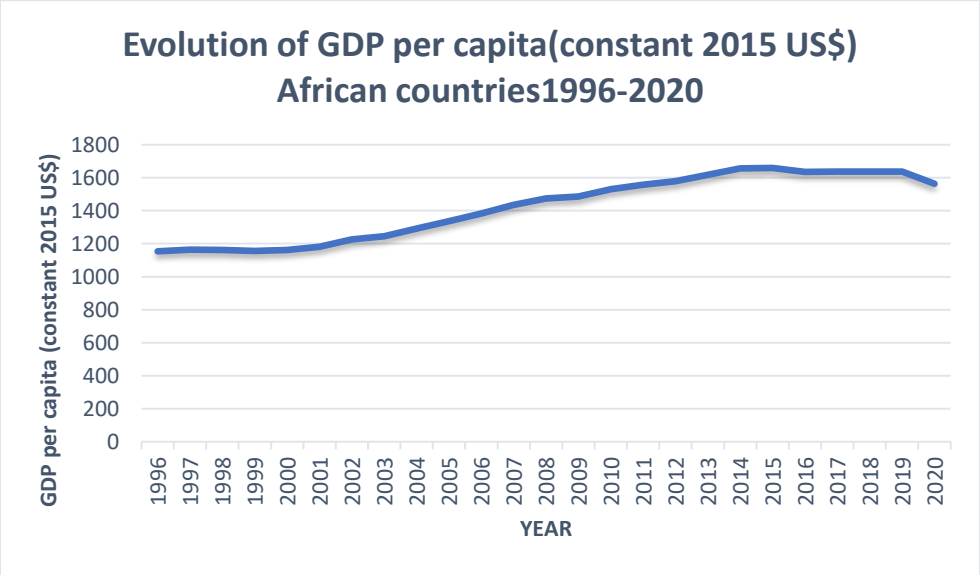
The four control variables were used, foreign direct investment, net inflows as a percent of GDP) (FDIGDP), Gross fixed capital formation (in constant 2015 dollars) (K_{pu}), Gross fixed capital formation, private sector (% of GDP): (K_{pr}/GDP) and Population, total (POP).

4.2.1 GDP per capita (constant 2015 US$)

GDP per capita is the gross domestic product divided by the mid-year population. It is calculated without making deductions for the depreciation of manufactured assets or the depletion and degradation of natural resources. Data are in constant 2015 US dollars.

Nowadays, GDP per capita is considered as one of the world's most powerful statistical indicators of the national economic growth of a country. The GDP per capita of different African countries from 1996 to 2020 is presented below.

Figure12: *Evolution of GDP per capita African countries 1996-2020*



Source: *WDI*

The evolution of GDP per capita in Sub-Saharan Africa has been rather increasing over the past 25 years. African countries moved from a per capita income of 1154 $ on average in 1996 to a per capita income of 1636$ in 2019, with a slight decrease in 2020 (1562$) due certainly to the Covid-19. This means that the output per person in the past was less than the output of the average person in four weeks in 2019.

It is remarkable how steady economic growth was over this very long period. From 1996 to 2020, the GDP per capita in Africa's economy has grown on average at 1.35 percent per year.

This growth is probably due to the relatively high participation of African countries in international trade (even though it is more through their imports than their exports), the openness of the borders, the economic agreement partnerships with other continents. Also, the efforts made in creating wealth through the education of the population, the empowerment of women, and entrepreneurship. However, this is still not enough to achieve significant growth and improve the well-being of the

population. Indeed, Africa lags far behind other continents in terms of per capita income and development in general.

4.2.2 Export Sophistication Index

The export sophistication index developed by Hausmann et al. (2007) was used as a benchmark measure.

In this measure, each good k that a country j can produce, and export has an intrinsic level of sophistication PRODYk, which is the weighted average of the income levels of exporters of good k, where the weights correspond to the revealed comparative advantage of each country j in good k.

$$\text{PRODYK} = \frac{1}{c_k} \Sigma_j \frac{X_{jk}}{X_j} Y_j$$

Here:

Xjk: is the value of exports of good k by country j,

Xj: is the total value of country j's exports.

Yj: is the per capita GDP in country j.

Ck: acts as normalization term used to have the sum of the coefficients equal to 1.

The more good k weights in the exports of a rich country, the higher its PRODY_k, the more sophisticated it is considered to be.

The sophistication level of country j's exports, denoted by EXPYj, is then computed as the average level of sophistication of its export basket. This is the weighted sum of the sophistication levels associated with each exported good k, PRODYk, with the weights being the shares of each good in the country's total exports. This thus reflects the degree of specialization of a country in high

PRODY goods:

$$EXPY_j = \Sigma_k \frac{X_{jk}}{X_j} PRODY_k$$

Thanks to the measures of product' level sophistication "PRODY" for the period 1996–2020, the EXPY: the productivity that corresponds to African countries' export baskets was constructed.

The data reveal that African countries lag far behind other regions of the world in exports sophistication. Consequently, this raises the question of whether export sophistication can contribute to improving per capita income in this continent. We will focus on detecting this link in chapter five.

4.2.3 Import sophistication index

We compute for each country (j) the level of sophistication associated with its imports from the region (r) (IMPYjr). The level of sophistication of the country (j)'s imports from a region (r) (IMPYjr) is a function of the nature of imported goods (in particular on the value of their IPRODY) and their share in total imports.

The export sophistication index developed by Hausmann et al. (2007) was still used as a benchmark measure.

$$IMPYjr = \Sigma_k \frac{X_{jkr}}{X_{jr}} IPRODYkr$$

Where:

Xjkr: is the value of imports of good k by country j, from country/region r.

Xjr: is the total value of country j's imports from country/region r.

IPRODYkr: productivity level associated with imported good k from region r.

Similarly, countries for which imports are more concentrated in high IPRODY products will have higher IMPY. for the case of African countries, data reveal that IMPY is greater than EXPY so, they rely on the import of high sophisticated goods. Goods for which, for the most part, they do not have the skill or technology levels required to produce them. According to Chen Xiaohua et al (2021), importing highly sophisticated goods will have negative effects on capital accumulation and human resources in R&D in the manufacturing sector mainly, leading a country to a greater dependence on foreign intermediate goods, capital goods, and consumer goods.

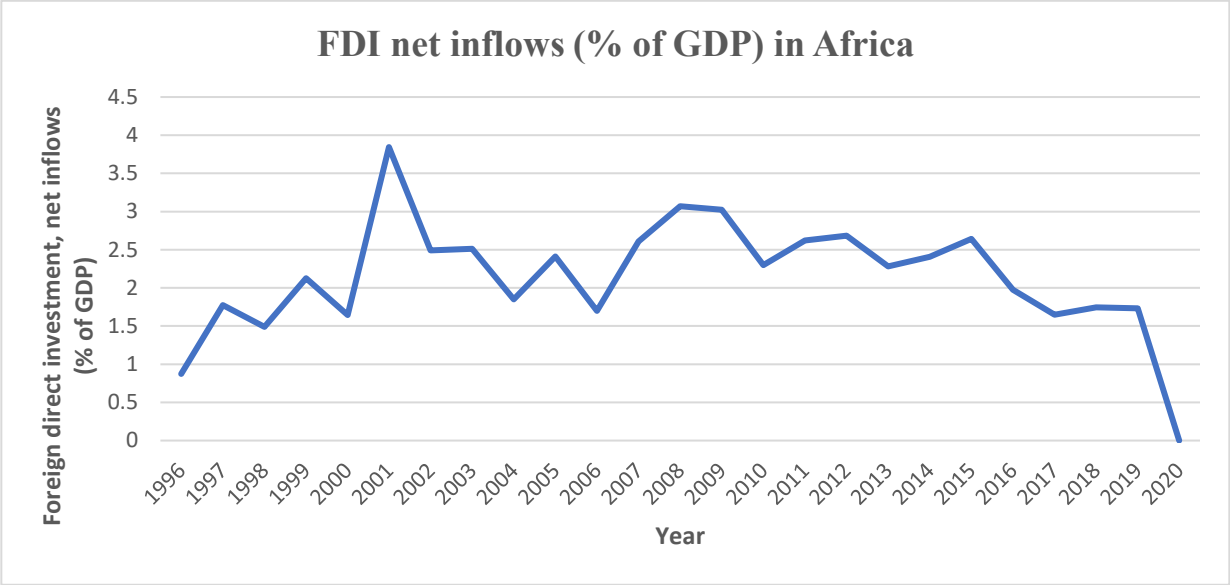
Indeed, we will explore this concept further in the next paragraph by determining whether the specialization of African countries in the import of highly sophisticated goods can contribute significantly to the improvement of their economic growth or not.

4.2.4 Foreign direct investment, net inflows (% of GDP)

Net FDI inflows are the value of the foreign direct investment by non-resident investors in Africa.

FDI inflows are expressed in USD and as a percentage of GDP. FDI creates stable and lasting links between economies.

Figure13: *FDI net inflows (%of GDP) African countries 1996-2020*



source: WDI

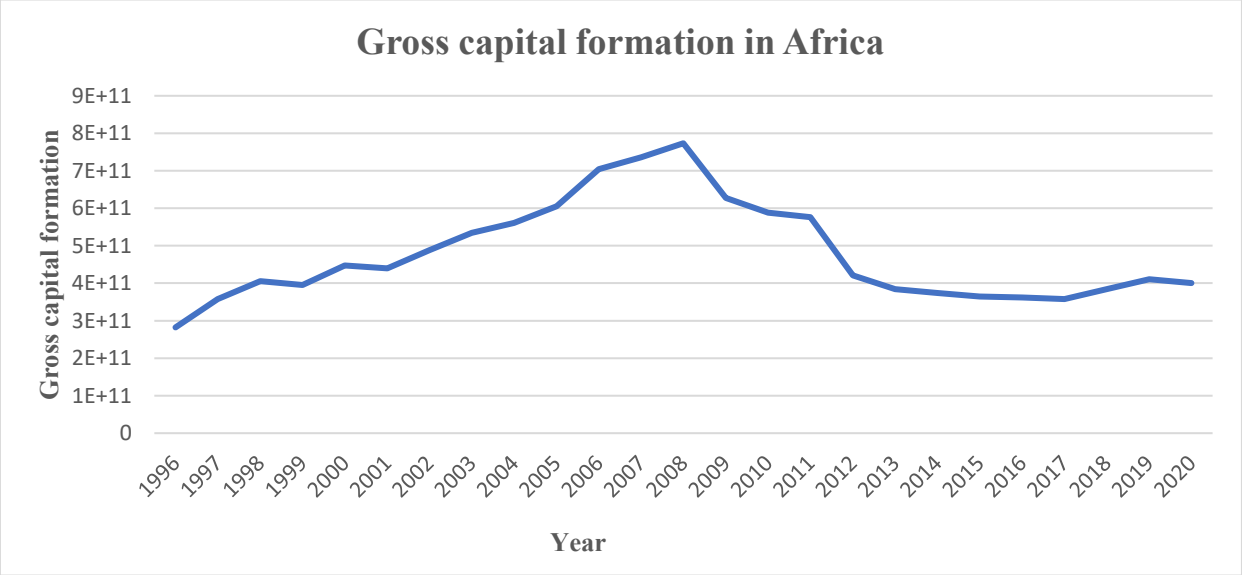
The chart above shows the variation of FDI inflow in Africa through the years. we can easily notice that the FDI inflow in terms of share in the GDP has been rather positive and increasing during the last 25 years. However, we notice a big decrease in 2020, due probably to the worldwide pandemic namely the covid-19 and the lockdown.

4.2.5 Gross fixed capital formation (constant 2015 US$)

Gross fixed capital formation (formerly gross domestic fixed investment) includes land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. According to the 2008 SNA, net

acquisitions of valuables are also considered capital formation. Data are in constant 2015 prices, expressed in U.S. dollars.

Figure14: *Gross capital formation African countries 1996-2020*



Source: WDI

The Gross fixed capital formation (constant 2015 US$) in Africa has been increasing across the continent, with an average rate of 7.5 percent for the period 2000-2012. This is because many African countries have embarked on the race to achieve economic emergence soon. Cameroon set the deadline in 2035, Gabon and Congo in 2025, Tchad in 2030, Equatorial Guinea in 2020. For this reason, they are investing more in the construction of public infrastructures even if this is still insufficient.

All these efforts from African countries confirm the strategic role of public investment in the growth process. In practice, it is difficult to imagine a strong economic activity in Africa without adequate and good quality infrastructure, and this is an area where public investment plays an important role.

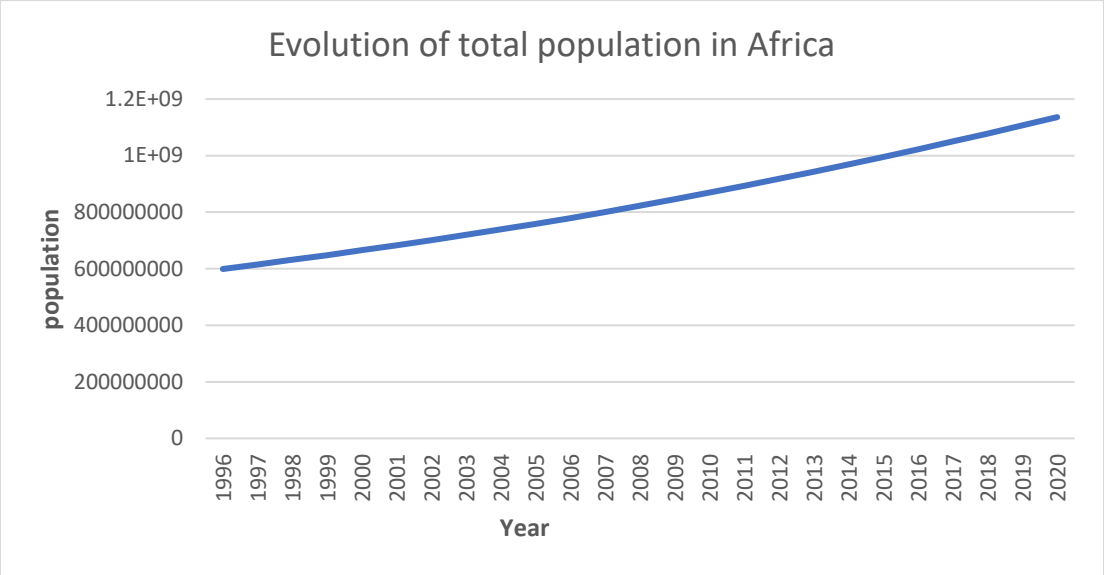
4.2.6 Gross fixed capital formation, private sector (% of GDP)

The private investment covers gross expenditures by the private sector (including private nonprofit organizations) for the acquisition of domestic fixed assets. It has been added as one of the control variables in the model.

4.2.7 Population

The total population of each African country is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship. The values shown are midyear estimates.

Figure 15: *Evolution of total population in Africa 1996-2020*



Source: WDI

The graph above shows us the ever-growing population in Africa. Indeed, Africa has the fastest population growth of all continents and the gap with other developing regions is deep. Africa's population is very young (with 40% under the age of 15), with high fertility (4.6 children per woman on average) and high mortality (life expectancy at birth is 54 years). Since the reproductive

age groups will continue to account for a large share of the population for a long time, and because of the relative inertia of demographic phenomena, population growth will remain high, and the age pyramid will remain young for a long period.

According to the average projection assumption of the United Nations, Africa's population will double by 2050 and, at 2 billion, will account for 22 percent of the world's population (up from 15 percent today), with 27 percent of the population under age 15 (United Nations,2009).

Mr. Abdalla Hamdok, the Deputy Executive Secretary of the United Nations Economic Commission for Africa said at Addis Ababa, on September 30, 2013, that “Africa should use its young and growing population as a means to rapidly develop its economy." Thus, a predominantly young population is an undeniable engine of growth if and only if it is properly exploited.

4.3 Data source

The data used in our estimates come primarily from the World Development Indicators database (WDI, 2021).

These data allowed us to have a panel database composed of 54 countries, namely all African countries. These data are annual and cover the period from 1996 to 2020; hence a total of 320 observations. The choice of this period is justified by the relative availability of data and the relative stability observed over this period. The list of the 54 African countries that make up this database can be found in the appendices.

4.4 Method of Estimation

To test the nexus between African countries' foreign trade in terms of specialization in the export and import of sophisticated goods and economic growth, we first perform the heteroskedasticity test to determine which model is most appropriate for our data set. The estimation retained for the study is an Ordinary Least squares (OLS) estimation on the First Differences of each variable of the model.

CHAPTER FIVE

FINDINGS AND DISCUSSION

The results of the estimation of this model have made it possible to formulate economic policy recommendations to help governments and policymakers in the choice of optimal economic policies likely to lead to economic emergence and have a real impact on the well-being of the population.

5.1 Descriptive Statistics

The table below briefly presents the different variables of the model, the expected sign of independents /control variables, and the data sources used.

Table 1: *Variables of the model, the expected sign of independents variables and the data sources used*

N0	Variables	Sign of the Regressors	Form	Sources
1	GDP per capita (constant 2015 US$)	/	US$	WDI
2	Foreign direct investment, net inflows (% of GDP)	+/-	US$	WDI
3	Gross fixed capital formation, private sector (% of GDP)	+	US$	WDI
4	Gross fixed capital formation (constant 2015 US$)	+	US$	WDI
5	Population	+/-	total	WDI
6	Country's Export sophistication index	+	US$	BACI database and WDI. Computation by Prof. Alessia Lo Turco.
7	Country's Import sophistication index	-	US$	BACI database and WDI. Computation by Prof. Alessia Lo Turco.

Table2: *Analysis of correlation between variables*

	GDPKPC 2015	**EXPY**	**IMPY**	**FDIGDP**	**K_{pu}**	**K_{pr}/GDP**	**POP**
GDPKPC2015	**1**						
EXPY	0.1001	**1**					
IMPY	-0.1087	0.0346	**1**				
FDIGDP	0.0458	0.0555	0.0239	**1**			
K_{pu}	-0.0085	-0.0366	0.0352	-0.0249	**1**		
K_{pr}/GDP	0.0694	0.2949	-0.0541	0.0388	-0.0230	**1**	
POP	-0.0193	0.0187	0.0045	0.0092	-0.0009	0.0052	**1**

Source: author computation

It can be seen in the table a relatively strong correlation between the dependent variable GDPKPC2015 (y) and the independent variables: EXPY**,** IMPY**;** and a very weak correlation between GDPKPC2015 and Kpu. This would mean that the main factors that policymakers should focus on to boost growth in Africa are mainly: EXPY and IMPY.

FDI, K_{pr}/GDP, K_{pu}, and POP will also be able to influence growth but at a very low percentage as obtained in the table above. This also confirms the mitigated character of these determinants of economic growth developed in the economic literature.

Table 3: *Summary Statistics*

	Mean	Median	Minimum	Maximum	Std.Dev.	C.V.	Missing Obs.
GDPKPC2015	3.60e+015	3.25e+015	4.65e+011	9.99e+015	2.61e+015	0.72	88
EXPY	6950.3	6116.5	569.00	18535	3931.1	0.56	556
IMPY	12413	12452	5869.0	18697	1327.5	0.10	492
POP	1.87e+007	1.02e+007	76417	2.06e+008	2.72e+007	1.45	9
FDIGDP	3.13e+015	2.62e+015	–8.92e+015	9.94e+015	2.90e+015	0.92	109
Kpr/GDP	2.80e+015	1.81e+015	0.00	9.91e+015	2.57e+015	0.91	612
Kpu	3.70e+015	2.86e+015	–4.35e+015	9.99e+015	2.64e+015	0.71	391

Source: Author Computation

We can see in the table that the mean of GDP per capita constant 2015 US $ over the last 25 years in Africa was about 3.6037e+015 US $. EXPY varies between 569.00 US $ and 18535 US $, IMPY varies between 5869.0 US $. and 18697 US $. which is greater than the EXPY as mentioned before. The coefficient of variation which is equal to standard deviation divided by mean shows us how dispersed our distribution is around the mean. A small C.V connotes a low variation. In our case, the C.V is not greater than one (except for the variable population); that implies that our distribution is more centered around the mean. The lowest values are “IMPY’’, “EXPY”, and the highest is given by ‘’population”, this means that ‘’IMPY’’ and “EXPY” are closest to the mean and ‘’population’’ is furthest from the mean.

5.2 Econometric Analysis

This section aims to present the data of the study and to highlight the econometric model used for the analysis of the potential determinants of growth, preselected based on the works developed in the different schools of economic thought as they have been developed in the literature review.

To test the nexus between African countries' foreign trade in terms of specialization in the export and import of sophisticated goods and economic growth, we first perform the heteroskedasticity test to determine which model is most appropriate for our data set.

For this test, hypotheses are set as followed:

H0: Heteroskedasticity is not present

H1: Heteroskedasticity is present.

Table4: *Results of Heteroskedasticity test*

White's test for heteroskedasticity Null hypothesis: heteroskedasticity not present	
Test statistic: LM	**37.01**
p-value = P (Chi-square (35) > 37.01)	**0.37**
R-Squared	**0.22**
Adjusted R-squared	**0.20**
S.D. dependent var	**1.21**
S.E. of regression	**1.08**
F (7, 308)	**12.58**
P-value(F)	**3.33e-14**

Source: author computation

According to the results of White's test for heteroskedasticity, the model is globally consistent because Prob> F= 3.33e-14 is less than 10%. This means that Ordinary Least squares (OLS) estimation on the First Difference of the model will be sufficient in explaining the data. There is no need to apply the panel effect (Random or Fix Model).

Table5: *Estimation Results*

First Difference Estimator by running an Ordinary Least squares (OLS) Estimation

Variables	**coefficients**
Δln(y)	/
Δln (y_1)	**-0.39** (4.82e-016) ***
Δln(expy)	**0.48** (0.06) *
Δln(impy)	**-1.83** (0.09) *
Δln(pop)	**-0.62** (0.92)
Δln (fdi)	**0.03** (0.51)
Δln (K_{pr}/GDP)	**0.00** (0.89)
Δln (K_{pu})	**0.03** (0.45)
Constant	**0.01** (0.92)
R-Squared	**0.22**
F (7,308)	3.33e-14

The probabilities marked with asterisks are the p-values that are statistically significant at 1% and 10% levels.

Source: Author Computation

5.3 Discussion

At first glance, we can see from this table that there are variables that are statistically significant, meaning, those that have a positive or negative influence on GDP per capita, and other variables are not significant.

According to the Ordinary Least Squares estimation, the variable Δln (y_1) is negatively and significantly correlated with the dependent variable Δln(y). In economic terms, GDP per capita in the current year (t) depends on GDP per capita in the previous year (t-1).

The constant term is positively correlated to the GDP per capita implying that other variables aggregately affect GDP per capita and have been included in the model. The result shows that even if all the regressors were equal to zero, GDP per capita will rise on average by 0.015 points.

The analysis of this table also shows that 2 of the 6 variables stand out from the others.

These are mainly the export sophistication index EXPY and the import sophistication index IMPY. These two variables have a significant impact on economic growth in Africa. If the export sophistication index has a positive impact on the economies of this part of the world; this impact is negative for the import sophistication index.

This is simply because, as mentioned in the literature review, the production and export of high value-added products automatically boost economic growth, while the import of capital, intermediate, and consumer goods make African economies dependent on the external market, which is not good for their economic growth.

Indeed, the result obtained from the table shows us that if the export sophistication index in Africa increases by 1%, then GDP per capita will increase by an average of 48%, which clearly shows the

importance and urgency for African countries to diversify their exports and produce high value-added goods such as manufactured goods.

The negative impact of the import sophistication index is clearly justified by the dependence of African countries on imports of consumer goods, the inability of local firms to produce goods on a large scale and with advanced technology to compete with multinational firms.

Indeed, according to the results obtained from the above table, if the import sophistication index increases by 1 point, then GDP per capita would decrease on average by 1.83 points. Hence the urgency for Africa to put in place strong economic policies to alleviate this problem which is also observed in their trade balance (they hardly achieve sustainable growth because they import high-valued products more than they export).

The export sophistication index thus appears to be the only variable to have a positive and significant impact on growth in all African countries. This tends to confirm certain results obtained by endogenous growth theorists; Hausmann et al., (2007), relating to the positive role played by export sophistication on economic growth.

The negative effect of population on the African economy can be explained by the low rate of education(according to UIS, almost 60% of youth between the ages of about 15 and 17 are not in school in SSA.), inequalities in the distribution of income, the orientation of economic activity, which is mostly dominated by the informal sector, the relatively low participation of women in the economic activity, the precarious health system with one of the highest mortality rates in the world; despite the fact that the population is mostly young.

The result obtained from the above table shows us that if the African population increases by 1%, then the per capita income will decrease on average by 63%. which is huge! So, governments

should pay attention to the increase of population while defining the economic policy and find a way to use this population in majority young to build and develop the continent, to boost the economy.

Results obtained using the OLS estimation of differenced variables show that FDI has a positive impact on economic growth in Africa. That is, if FDI net inflow increases by 1%, then GDP per capita income will increase on average by 3%. However, it is not significant in terms of analyzing the relationship between these two variables. This is probably due to the poor governance (corruption), the relatively low level of education of the population which seems to not be ready to assimilate and replicate the technology transfer brought by FDI, or rather to the fact that foreign companies are reluctant to diffuse their technology to the local firm and population.

Gross fixed capital formation has a positive impact on GDP per capita income in Africa. However, it is not significant. This could be justified by the increase in misappropriation of public assets, lack of leadership, poor governance, and lack of infrastructure. Although spending on infrastructure has begun to accelerate in the last two decades, it is still not enough. According to the World Bank, African countries should be investing about $93 billion a year to upgrade their infrastructure, but they are spending only half that amount.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study is an attempt to shed light in Africa on the relationship between Foreign Trade and more particularly the Sophistication of the exports and imports basket of African countries and Economic growth to enable the countries of this zone, in particular Cameroon, which has set itself the goal of achieving economic emergence by 2035, to know which macroeconomic aggregates to rely on to boost its potential and have a growth rate that is indispensable for achieving this aim of economic emergence.

Six indicators were selected from the literature review and used to analyze the relationship between African foreign trade and economic growth: The export sophistication index (EXPY), Import sophistication index (IMPY), Population (POP), Foreign Direct Investment inflows (FDI), Gross fixed capital formation (in constant 2015 dollars): $K_{pu,}$ Gross fixed capital formation, private sector (% of GDP): K_{pr}/GDP and Gross domestic product per capita (GDPK2015) as a proxy for economic growth.

This study was conducted on panel data of 54 African countries for a study period from 1996 to 2020, and First Difference Estimator by running an Ordinary Least squares (OLS) Estimation was used to analyze the data. After running the Heteroskedasticity test, the results showed that this model is best adapted for the case of Africa. We got from the results' table that among the six variables used as exogenous variables in the estimation of the model (EXPY, IMPY, POP, FDI, Kpr/GDP, and Kpu) only EXPY and IMPY have a significant impact on the economic growth

observed in all African countries. While EXPY contributes positively to economic growth, IMPY contributes negatively and confirms the hypothesis formulated in the analysis.

The positive effect of the sophistication index of the export basket of African countries on economic growth is strongly evident as African exporting firms naturally obtain value-added by selling their products on the world market. However, this still seems very low given that Africa is far behind in its positioning in the global value chain. Indeed, as mentioned before, the participation of these countries in GVCs is heavily driven by the export of agricultural and mining products, which has strongly limited the gains in export performance.

Limitation

It is important to note that the results obtained depend on the quality of the data used. Indeed, the data used for the estimation come mainly from the World Development Indicator. However, we obtained a very unbalanced panel of data due to the unavailability of certain data in several African countries. Especially those in political instability where economic activity has slowed down completely. These include Somalia and South Sudan, among others. This has probably influenced the results of the estimation.

As another limitation, we can note the limitation of the period of study, perhaps that a wider period could allow obtaining even more interesting results than those obtained in this study.

Recommendations

Rather than relying on primary commodity exports and more generally to boost the economy, African countries should add value to their commodities to promote structural transformation and sustained growth, which will also allow them to position themselves upstream in the GVC like developed countries. African governments should also have a more coherent approach to the various trade negotiations and agreements to which they are party so that the results of these negotiations and the implementation of these agreements contribute to the real transformation and economic development of the continent. Moreover, regional production integration would be an advantage if the strategy is oriented towards the creation and coordination of regional value chains in high value-added activities, especially value-added manufactured products that can create more jobs and generate a necessary growth that can lead to economic emergence.

Furthermore, there is a need for effective public intervention to improve the sophistication of existing products and promote new ones. This will be done through investments in infrastructure and support to exporting companies. Indeed, infrastructure development plays a central role in promoting exports by reducing the cost and delivery time of goods. Again, African authorities must face the major challenge which is to accelerate the industrialization of the region by shifting industrial policy toward investments in more sophisticated, high value-added activities and products. They also need to facilitate access to financing services for producers and exporters, including cheap credit at preferential rates; Cultivate transparency in the management of public finances and encourage entrepreneurship in strategic and priority sectors to improve the efficiency of public and private investments.

Finally, governments should improve training provided by public and private education so that they can be in line with the demand of the employment market; to have a good quality workforce. Encourage as well women's empowerment, and establish strong institutions to fight against corruption and misappropriation of public funds.

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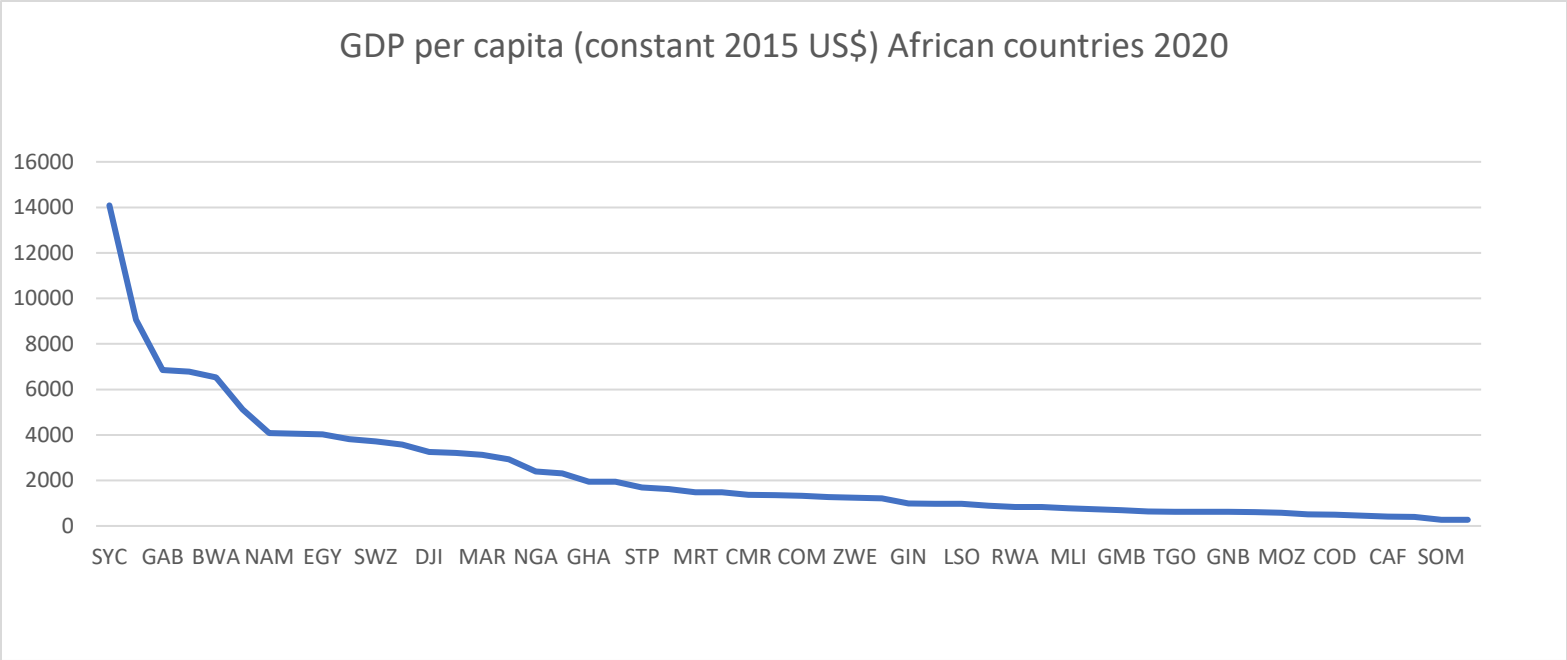
APPENDIX



Source: WDI

Table: *List of African countries*; **Source**: WDI

countries	Country's code
Algeria	DZA
Angola	AGO
Benin	BEN
Botswana	BWA
Burkina Faso	BFA
Burundi	BDI
Cabo Verde	CPV
Cameroon	CMR
Central African Republic	CAF
Chad	TCD
Comoros	COM
Cote d'Ivoire	CIV
Congo, Dem. Rep.	COD
Congo, Rep.	COG
Djibouti	DJI
Egypt, Arab Rep.	EGY
Equatorial Guinea	GNQ
Eritrea	ERI
Eswatini	SWZ
Ethiopia	ETH
Gabon	GAB
Gambia	GMB
Ghana	GHA
Guinea	GIN
Guinea-Bissau	GNB
Kenya	KEN
Lesotho	LSO
Liberia	LBR
Libya	LBY
Madagascar	MDG
Malawi	MWI
Mali	MLI
Mauritania	MRT
Mauritius	MUS
Morocco	MAR
Mozambique	MOZ
Namibia	NAM
Niger	NER
Nigeria	NGA
Rwanda	RWA
Sao Tome and Principe	STP

Senegal	SEN
Seychelles	SYC
Sierra Leone	SLE
Somalia	SOM
South Africa	ZAF
South Sudan	SSD
Sudan	SDN
Tanzania	TZA
Togo	TGO
Tunisia	TUN
Uganda	UGA
Zambia	ZMB
Zimbabwe	ZWE